

**NATIONAL OCCUPATIONAL
STANDARD (NOS)**

IN

**FISH FARMING PRACTICE
(LEVEL 1)
*AQUACULTURE SECTOR***

2018

GENERAL INFORMATION

QUALIFICATION PURPOSE

This qualification is aimed at developing competence in fish production across different platforms. The focus is on fish production process, communication skills, inter-personal skills development and workplace experience.

QUALIFICATION OBJECTIVES

To achieve this qualification, the fish producer should gain the following competencies:

- Apply safe working practices in their work environment
- Carry out health and safety PPE, signs and symbols and how to use them correctly.
- Communicate effectively in a fish farming working environment.
- Use basic tools, equipment and materials for fish production
- Carry out fish production using different systems
- Design fish harvesting gears and crafts

Summary of Qualification

S/No	Reference Number	NOS Title	Credit Value	Guided Learning Hours	Remarks
1	AQC/FFP/01/L1	Work Safely in Fish Farming Environment	2	20	Mandatory
2	AQC/FFP/02/L1	Communicate Effectively in Fish Farming Environment	2	20	Mandatory
3	AQC/FFP/03/L1	Team Work in Fish Farming Practice	2	20	Mandatory
4	AQC/FFP/04/L1	Introduction to Fish Farming in Nigeria	3	30	Mandatory
5	AQC/FFP/05/L1	Basic Aquaculture	4	40	Mandatory
6	AQC/FFP/07/L1	Introduction to Fish Pond Design and Construction	3	30	Mandatory
		Sub-Total	16		
7	AQC/FFP/06/L1	Introduction to Harvesting Gear and Craft technology	3	30	Optional
8	AQC/FFP/08/L1	Method of Table Size Fish production	3	30	Optional
		Sub-Total	6		
		Grand Total	22	220	

NOTE:

The minimum credit required for Level I qualification in Fish Farming is 19 credit value.

To achieve this qualification; A Learner is required to achieve 16 credits from mandatory units and 3 from optional unit.

Each Credit is equivalent to approximate to 10 Guided Learning Hours (GLH). The Total Learning Hours will therefore consist of the GLH *plus* the independent learning hours of the candidate, which is generally 50% – 150% of the GLH.

National Vocational Qualification

LEVEL 1 Aquaculture

Unit 1: Work Safely in Fish Farming Environment

Unit Reference Number: AQC/FFP/01/L1

NVQ Level: 1

Credit Value: 3

Guided Learning Hours: 30

Unit Purpose: This unit is on the adherence to health and safety precaution and avoidance of environmental hazards associated with rice processing.

Unit assessment requirements/evidence requirements:

Assessment must be carried out in real workplace environment in which learning and human development is carried out. ***Simulation is not allowed*** in this unit and level.

Assessment methods to be used include:

1. Direct Observation/oral questions (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Personal statement (PS) or Reflective Practice (RP)
5. Work Product (WP)
6. Recognition of Prior Learning (RPL)
7. Other methods (O t), assignments, case study, essay, project, etc.

UNIT 01: Work Safely in Fish Farming Environment

LEARNING OBJECTIVE (LO) The learner will:		PERFORMANCE CRITERIA The learner can:	Evidence Type				Evidence Ref. Page No.			
LO 1: Work safely in Fish Farming Environment.	1.1	Explain safe work practices along the fish production value chain								
	1.2	Identify safety signs and symbols in fish processing facilities								
	1.3	Provide safety signs and symbols correctly								
	1.4	Demonstrate safe work practices and instructions in fish processing facilities								
	1.5	Operate in accordance with health and safety practices								
LO 2: Comply with safety standards in fish processing facilities	2.1	Identify work environment hazards								
	2.2	State types of hazards and risks in fish processing facilities								
	2.3	State safety standards in fish processing facilities								
	2.4	Use safety tools, materials and equipment in fish processing facilities								
LO 3: Apply personal protective equipment (PPE) in fish processing facilities	3.1	Identify the types of PPEs								
	3.2	Select appropriate PPE								
	3.3	Demonstrate the use of PPE								
	3.4	Maintain PPE before or after use								
LO 4: Response to accidents/injury in fish processing	4.1	Locate first aid facility								
	4.2	Use basic dressing materials								
	4.3	Respond to supervisor given instructions								
	4.4	Report accident/injury to the appropriate supervisor								
LO 5:	5.1	Use safe access and exit routes in the work environment								
	5.2	Identify appropriate working tools, materials and equipment								

LEARNING OBJECTIVE (LO) The learner will:		PERFORMANCE CRITERIA The learner can:	Evidence Type				Evidence Ref. Page No.			
Apply safe work habit and clean work environment in fish processing	5.3	Use tools and equipment safely in accordance with the supervisors instructions								
	5.4	Return all tools, equipment and unused materials for appropriate storage								
	5.5	Carry out general house keeping of work environment								
	5.6	Dispose all wastes appropriately to designated waste facilities								
LO 6: Comply with standards of lifting, loading/offloading and stacking of materials in fish processing facilities	6.1	Identify lifting and stacking techniques								
	6.2	Demonstrate lifting techniques in loading and offloading of materials without assistance								
	6.3	Demonstrate correct lifting and loading techniques with mechanical assistance								
	6.4	Stack materials correctly								
Learners Signature:			Date:							
Assessors Signature:			Date:							
IQA Signature (if sampled)			Date:							
EQA Signature (if sampled)			Date:							

National Vocational Qualification
LEVEL 1 AQUACULTURE SECTOR

Unit 2: Communicate Effectively in Fish Farming Environment

Unit Reference Number: AQC/FFP/02/L1

QCF Level: 1

Credit Value: 3

Guided Learning Hours: 30

Unit Purpose: This unit is about simple communication techniques in fish farming.

Unit assessment requirements/evidence requirements:

Assessment must be carried out in real workplace environment in which learning and human development is carried out. ***Simulation is/or is not allowed*** in this unit and level.

Assessment methods to be used include:

1. Direct Observation/oral questions (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Personal statement (PS) or Reflective Practice (RP)
5. Work Product (WP)
6. Recognition of Prior Learning (RPL)
7. Other methods (O t), assignments, case study, essay, project, etc.

UNIT 02: Communicate Effectively in Fish Farming Environment

LEARNING OBJECTIVE (LO) The learner will:		PERFORMANCE CRITERIA The learner can:	Evidence Type				Evidence Ref. Page No.			
LO 1: Apply the use of a non-complex communication system in a work environment	1.1	Use a verbal means to pass on necessary information								
	1.2	Use non-verbal means to convey necessary information e.g. body language, signs								
	1.3	Interpret symbols and signs appropriately								
LO 2: Source for information in a work environment	2.1	Identify the source of information in the work environment								
	2.2	Relate effectively with the source of information								
	2.3	Use the different information flow systems in a work environment								
	2.4	Use information gathered to avoid challenges in a work situation								
	2.5	Report findings appropriately in accordance with laid down procedures in the work environment i.e. Cards, Flip Chart								
	2.6	Use simple communication gadget like mobile phones and table phones								
LO 3: Apply various means of communication in a work environment	3.1	Locate the various communication equipment in the work environment								
		Use effectively the various communication equipment in a work environment								
	3.2	Pass information effectively to the right personnel								
	3.3	Obey instructions in line with ethics of the work environment								

Learners Signature:	Date:
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	Date:

UNIT 3: TEAM WORK

Unit Reference Number: AQC/FFP/03/L1

QCF Level: 2

Credit Value: 2

Guided Learning Hours: 20

Unit Purpose:

The purpose for this unit is to impact into the learner the necessary skills, knowledge and understanding required to develop team spirit and positive working relationship with colleagues.

Unit Assessment requirement

Assessment of this unit must be at a real practical work environment, simulation is not allowed unless where indicated.

Unit assessment requirements/evidence requirements

- Observation
- Work Product
- Professional Discussion
- Question and Answer

Unit 3: Teamwork

LO (Learning outcome)		Criteria:-	Evidence Type				Evidence Ref Page number			
LO 1 Positive working relationship with colleagues	1.1	Identify the need for developing positive working relationship with colleagues								
	1.2	Recognize the importance of relating with other people in a way that makes them feel valued and respected								
	1.3	Assist team members when required.								
	1.4	Report to the appropriate personnel when request for assistance fall outside area of responsibility.								
	1.5	Communicate information to colleagues about individual work that may affect team work.								
LO 2 Take responsibility within the team	2.1	Recognize own role and responsibilities within a team								
	2.2	Perform individual tasks in line with the team's rules and regulations.								
	2.3	Participate effectively in teamwork.								
LO.3 Compliance with policy of organisation	3.1	Explain organizational code of conduct								
	3.2	Work in line with organizational standard								
	3.3	Use organizational code of practice								
	3.4	Adhere strictly to instructions given by the Management								

Learners Signature:	Date:
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	Date:

UNIT 4: Introduction to Fish Farming in Nigeria

Unit Reference Number: AQC/FFP/04/L1

QCF Level: 1

Credit Value: 3

Guided Learning Hours: 30hours

Purpose:

This unit standard specifies the competencies required to demonstrate the understanding of the concept, history and development of fish farming in Nigeria. It includes history and development of fish farming, career opportunities and working conditions. This unit standard is intended for those who are interested in operating small scale fish farms and carrying out associated production processes.

Pre-requisite(s)

1. Entry information:
Pre requisite(s):
 - Unit ID F/001 – Basic literacy

Special Notes

1. This unit standard is to be delivered and assessed in the context of fish farming, and should be assessed in conjunction with other relevant technical units selected from this domain.
2. To demonstrate competence, at a minimum, evidence is required of the correct understanding of the history and development of fish farming, career opportunities and working conditions. Perform these tasks ensuring correct identification of major fish producing areas, freshwater fish species/types and their economic importance as well as possible career opportunities as they relate to working conditions in Nigeria.
3. Assessment evidence may be collected from a real workplace or a simulated real workplace or an appropriate simulated realistic environment in which fish farming operations are carried out.

4. All inspection, operation and maintenance procedures associated with the use of tools and equipment shall comply with manufacturers' and company guidelines, instructions, and reasonable flat rate time.
5. Glossary of terms:
 - *"Aquaculture"*: is the farming of aquatic organisms and plants in fresh, brackish or salt water.
 - *"Hatchlings"* : newly hatched fishes
 - *"Fingerlings"*: young fishes aged 28 days
 - *"Juveniles"*: Fish seed aged four to six weeks old.
6. Regulations and legislation relevant to this unit standard include the following:
 - Nigerian constitution and Land use act 1978
 - Agriculture promotion policy (2016 – 2020)
 - NESREA (National environmental standard & regulation enforcement agency) Act 2007 (section 7)
 - Security exchange commission (SEC) – investment and security Act 2007.
 - Agriculture promotion policy: 2016-2020
 - Inland fisheries Act, CAP 110, LFN, 2004.
 - Water resources Act, CAP W2, LFN, 2004.
 - Nigeria agro-processing and food safety commission bill, 2012.
 - WHO (2006), guidelines on safe use of waste water and excreta in aquaculture, volume 1. Policy and regulation aspects.
 - NAFDAC (National Agency for Food and Drug Administration and Control) **ACT** CAP, N1 LFN, 2004.
 - **Range:**
 - **Terminologies include but not limited to:**
 - **Fish:** Hatchlings, fingerlings, juveniles, nursery, stocking rate, stocking density, spawning, stripping, etc.
 - **Different freshwater fish include but not limited to:**
 - **Fish types:** Fin and finless, skin and skinless, and scales and non-scales fish.
 - **Fish species:** Tilapia, carp, catfish etc.
 - **Factors that affect fish farming includes but not limited to:**
 - **Fish:** Land, good water supply, fertile soil, capital, fish stock, processing and preservation, marketing and harvesting procedures.
 - Different career opportunities in fish farming include but not limited to:
 - **Fish farming:** Fish seed production (breeders), Feed formulation (Feed Millers), Fish rearing (farmers), fish processing (Processors), fish marketing (Marketers) etc.

Unit Assessment requirement:

Assessment of this unit must be at a real practical work environment, simulation is not allowed unless where indicated.

Unit assessment requirements/evidence requirements

- Observation
- Work Product
- Question and Answer
- Recognition of Prior Knowledge

Unit 4: Introduction to Fish Farming in Nigeria

LO (Learning outcome)	Performance Criteria:-	Evidence Type	Evidence Ref Page number
LO1 Understand the history and development of fish farming in Nigeria	1.1	State the origin of fish farming in Nigeria.	
	1.2	Explain the history and development of fish farming in Nigeria	
	1.3	Explain the various terminologies used in fish farming (e.g. Hatchlings, fingerlings, juveniles, nursery, stocking rate, stocking density, spawning, stripping, etc)	
	1.4	Explain the socio-economic importance of fish farming in Nigeria.	
	1.5	Explain factors that affect fish farming in Nigeria	
	1.6	State relevant laws and regulations applicable to fish farming in Nigeria	
	1.7	Explain the geographical importance of fish farming in Nigeria.	
	1.8	Identify the various species of fish in Nigeria	
	1.7	Use appropriate map to identify major fish species in Nigeria.	
LO2 Highlight employment characteristics in fish farming	2.1	Outline the various career opportunities in fish farming in Nigeria.	
	2.2	Explain the value chain of fish farming in Nigeria	
	2.3	List the key role players in fish farming in Nigeria.	
	2.4	Describe major fish marketing techniques used in Nigeria e.g. <ul style="list-style-type: none"> - On farm sales - Off farm sales - Information dissemination - Delivery to the point of request 	
	2.5	Explain the working conditions in fish farming	
	2.6	Partake in carrying out one major fishing marketing technique in your locality.	
LO3	3.1	List various constraints to fish farming in Nigeria e.g.	

Demonstrate knowledge of constraints in fish farming in Nigeria		<ul style="list-style-type: none"> - Weather - Land tenancy/ acquisition - Funding - Pouching (human and predators) - etc 								
	3.2	Classify the constraints to fish farming into the following factors: <ul style="list-style-type: none"> - social - economic, and cultural 								
	3.3	Explain the possible ways f overcoming constraints to fish farming in Nigeria.								

Learners Signature:	Date:
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	Date:

UNIT 5: Basic Aquaculture

Unit Reference Number: AQC/FFP/05/L1

QCF Level: 2

Credit Value: 4

Guided Learning Hours: 40hours

Unit Purpose:

The unit is designed to acquaint students with the general principle of aquaculture particularly as it affects warm water fish species.

Unit Assessment requirement

Assessment of this unit must be at a real practical work environment, simulation is not allowed unless where indicated.

Unit assessment requirements/evidence requirements

- Observation
- Work Product
- Question and Answer
- Assignment

UNIT 5: Basic Aquaculture

LO (Learning outcome)		Criteria:-	Evidence Type				Evidence Ref Page number			
LO1 Demonstrate knowledge of the meaning and scope of aquaculture	1.1	Define aquaculture.								
	1.2	Explain the potential of aquaculture in boosting fish production in Nigeria								
	1.3	List major culturable fish types in Nigeria e.g. table fish, ornamental fish, shellfish.								
	1.4	List common non-culturable fish species in Nigeria.								
	1.5	Differentiate between culturable and non-culturable fish species (i.e .fin fishes and marine fishes).								
	1.6	Identify key species of fish cultured in Nigeria.								
	1.7	Identify major fish types in Nigeria e.g. table fish, ornamental fish, shellfish.								
	1.8	Separate fishes into culturable and non-culturable fish species.								
	1.9	Draw different culturable and non-culturable fish species (fin fish and shell fish).								
LO2 Describe various types of Fish Farming systems	2.1	Define extensive and intensive fish farming systems.								
	2.2	List the differences between extensive and intensive fish farming systems.								
	2.3	Explain the advantages and disadvantages of extensive and intensive fish farming systems								
	2.4	Describe the facilities used for culture of fish								
	2.5	Identify the facilities for the culture of fish								
LO3 Explain natural, formulated and supplementary feeds ponds	3.1	Explain natural, formulated and supplementary feeds for fishes.								
	3.2	Explain the importance of natural, formulated and supplementary feeds for fishes.								
	3.3	Differentiate between natural and formulated feeds for fishes.								
	3.4	List the methods available for the production of natural fish feed.								
	3.5	Explain locally available common fish feed stuffs (e.g. soya bean cake, groundnut cake, fish meal, maize brown, wheat offal, lysine, methionine, etc)								
	3.6	Explain method of preparation of locally available common fish feed stuffs (e.g soya bean, cake,								

UNIT 6: Introduction to Harvesting Gear and Craft Technology

Unit Reference Number: AQC/FFP/005/L1

QCF level: 2

Credit value: 4

Guided learning hours: 40hours

Unit Purpose:

The unit is designed to acquaint students with the general principle of aquaculture particularly as it affects warm water fish species.

Unit Assessment requirement

Assessment of this unit must be at a real practical work environment, simulation is not allowed unless where indicated.

Unit assessment requirements/evidence requirements

- Observation
- Work Product
- Question and Answer
- Assignment

UNIT 6: Introduction to Harvesting Gear and Craft Technology

LO (Learning outcome)		Criteria:-	Evidence Type				Evidence Ref Page number			
LO1 Demonstrate understanding of fish harvesting gears and craft technology used in aquaculture	1.1	List different harvesting gear (e.g. Scoop net, Hand net, Cast net, Seine, Drag net, etc)								
	1.2	Classify fishing gear used in aquaculture in Nigeria into traditional and modern fishing gears								
	1.3	Classify fishing gear into: - Active fishing gear (e.g. trawl, cast net, seine nets, claps nets, etc) - Passive fishing gear (gill net, trammel nets, traps etc.)								
	1.4	Identify various harvesting gears used in aquaculture (e.g. Scoop net, Hand net, Cast net, Seine, Drag net, etc)								
	1.5	Identify harvesting craft used in aquaculture								
LO 2 Construct Fish harvesting gears and craft used in aquaculture	2.1	List synthetic fibre materials used in the construction of fishing gears.								
	2.2	Describe the physical characteristics of synthetic fibres in terms of flexibility and strength.								
	2.3	Identify synthetic fibre for net construction								
	2.4	Carry out identification test on various types of synthetic fibres (through water test).								
	2.5	Carry out identification test on various types of synthetic fibres (through visual test).								
	2.6	Identify sources of natural fibre used for construction of harvesting gears (e.g Jute, Sedges, Cyperus grass, typha grass, etc)								
	2.7	Define terms associated with net construction (e.g. normal and T-cut, bar-cut, combination cut, etc)								
	2.8	Demonstrate various types of cut used on net construction								
	2.9	Explain stages involved in net construction namely braiding, strand formation, tapering, creasing, joining, knotting, etc)								
	2.10	Construct net using typha grass applying the stages of net construction in 2.9								
LO3 Demonstrate the use of fish harvesting gears and craft in Aquaculture	3.1	Explain the meaning of setting in harvesting gear								
	3.2	Demonstrate the use of drag net for harvesting in ponds								
	3.3	Demonstrate the use of Kayak in aquaculture activities (e.g. distribution of feed, positioning of cage in water)								

UNIT 7: Introduction to Fish Pond Design and Construction

Unit reference number: AQC/FFP/007/L1

QCF level: 2

Credit value: 4

Guided learning hours: 40hours

Unit Purpose:

The unit is designed to acquaint students with the general principle of aquaculture particularly as it affects warm water fish species.

Unit Assessment requirement

Assessment of this unit must be at a real practical work environment, simulation is not allowed unless where indicated.

Unit assessment requirements/evidence requirements

- Observation
- Work Product
- Question and Answer
- Assignment

UNIT 7: Introduction to Fish Pond Design and Construction

LO (Learning outcome)		Criteria:-	Evidence Type				Evidence Ref Page number			
LO1 Demonstrate knowledge of factors to be considered in the choice of pond site	1.1	List factors to be considered in the construction of fish pond (e.g. topography, vegetation, source of water, water quality, soil type and structure, etc).								
	1.2	Explain the effect of factors considered in the construction of fish pond (e.g. topography, vegetation, source of water, water quality, soil type and structure, etc).								
	1.3	Carry out selection of pond site taking into consideration the effect of factors listed in 1.1.								
	1.4	Determine elevation and distance of a pond site using simple instruments like, hand level, kern levels, ranging poles, measuring tapes etc								
	1.5	Perform on-site soil testing for water retention on a selected pond site by the use of hand mould.								
LO2 Describe different types of facilities used for fish culture	2.1	List different types of facilities for culturing fish (e.g. ponds, cage, pen, raceways, collapsible tanks, make-shift tanks, fibre tanks, etc.)								
	2.2	Classify culturing facilities in 2.1 into: - Those can be used on the farm - Those that an used in open water body								
	2.3	Describe the features of the following fish culture facilities; pond, cage and pen.								
	2.4	Identify the following fish culture facilities; pond, cage and pen.								
	2.5	Make a sketch of a concrete pond and label appropriately.								
	2.6	Make a sketch of an earthen pond and label appropriately.								
LO3 Demonstrate the use of tools and equipment in pond construction	3.1	Identify different tools used in pond construction (e.g. shovels, wheel barrows, diggers, etc)								
	3.2	Identify different equipment used in pond construction (e.g. bulldozer, scrapper, dragline, sheepfoot roller, etc)								
	3.3	Describe the use of different tools used in pond construction (e.g shovels, wheel barrows, diggers, etc)								
	3.4	Describe the use of different equipment used in pond construction (e.g. bulldozer, scrapper, dragline, sheepfoot roller, etc)								
	3.5	Demonstrate the use of simple tools in pond construction.								

UNIT 8: Production of Table Size Fish

Unit reference number: AQC/FFP/005/L1

QCF level: 2

Credit value: 4

Guided learning hours: 40hours

Unit Purpose:

The unit is designed to acquaint students with the general principle of aquaculture particularly as it affects warm water fish species.

Unit Assessment requirement

Assessment of this unit must be at a real practical work environment, simulation is not allowed unless where indicated.

Unit assessment requirements/evidence requirements

- Observation
- Work Product
- Question and Answer
- Assignment

UNIT 8: Production of Table Size Fish

LO (Learning outcome)		Criteria:-	Evidence Type				Evidence Ref Page number			
LO1 Stock fingerlings for table size production	1.1	Identify of source of fingerlings outfits (supply)								
	1.2	Explain stocking rate of fingerlings in ponds								
	1.3	Describe fish stocking procedures in ponds								
	1.4	Describe materials needed for rearing of table size of fish								
	1.5	Stock fingerlings at appropriate stocking rate								
LO2 Carry out rearing of table size fish	2.1	Describe the process of rearing of table fish								
	2.2	Describe feeding methods of table size								
	2.3	Explain different size of fish feed pellets appropriate for feeding fish of different sizes								
	2.4	Explain feeding regime of fish								
	2.5	Feed fish based on percentage body weight.								
	2.6	Observe fish health and safety precautionary measures in rearing of table size fish.								
LO3 Explain importance and uses of table size fish	3.1	Explain the importance of table size fish								
	3.2	Explain the uses of table size fish e.g <ul style="list-style-type: none"> - As a source of nutrients to human health - Generation of income to farmers - For medicinal purpose in the use of fish oil - Production for fishmeal as feed ingredients to animal feed industry - Generate employment - Provide raw materials to local industries e.g pharmaceutical, feed meal processing, leather industry, etc) 								

**NATIONAL OCCUPATIONAL
STANDARD (NOS)**

IN

**FISH FARMING PRACTICE
(LEVEL 2)
AQUACULTURE SECTOR**

2018

NATIONAL VOCATIONAL QUALIFICATION

AQUACULTURE SECTOR

NVQ LEVEL 2 IN FISH FARMING PRACTICE

GENERAL INFORMATION

QUALIFICATION PURPOSE

This qualification is aimed at developing competence in fish production across different platforms. The focus is on fish production process, communication skills, inter-personal skills development and workplace experience.

QUALIFICATION OBJECTIVES

To achieve this qualification, the fish producer should gain the following competencies:

- Apply safe working practices in their work environment
- Identify health and safety PPE, signs and symbols and how to use them correctly.
- Communicate effectively in fish farming environment.
- Produce fish seed using different methods
- Formulate, process, prepare and store fish feed.
- List basic tools, equipment and materials for fish seed production
- Handle fish properly after harvesting, process effectively and preserve

Summary of Qualification

S/ N	Reference Number	NOS Title	Credit Value	Guided Learning Hours	Remark
1	AQC/FFP/01/L2	Follow health, safety and environmental practices in fish farming	3	30	Mandatory
2	AQC/FFP/02/L2	Communication and Interpersonal Skill	2	20	Mandatory
3	AQC/FFP/03/L2	Team Work in Fish Farming Environment	2	20	Mandatory
4	AQC/FFP/04/L2	Biology of Fishes	3	30	Mandatory
5	AQC/FFP/05/L2	Methods of Fish Seed Production	3	40	Mandatory
6.	AQC/FFP/06/L2	Facilities and Resources used in Table size fish production	3	30	Mandatory
7.	AQC/FFP/07/L2	Formulation, Processing and Storage of Fish Feed	4	40	Mandatory
8.	AQC/FFP/08/L2	Safe handling and transportation of freshwater fish in Nigeria	2	20	Mandatory
		Sub-total	22		
9.	AQC/FFP/09/L2	Fish Health Condition in Fresh Water Fish Culture	2	20	Optional
10.	AQC/FFP/10/L2	Fish Post Harvest Handling, Processing and Preservation in Nigeria	3	30	Optional
11.	AQC/FFP/11/L2	Market and Marketing Strategies of fresh water fish in Nigeria	2	20	Optional
		Sub-total	7	300	
		Grand-total	29		

NOTE:

The minimum credit required for Level 2 Qualification in Fish Farming is 26 credit value.

To achieve this qualification; Learners are required to achieve 22 credits from mandatory units and 4 from optional units.

Each Credit is equivalent to approximate to 10 Guided Learning Hours (GLH). The Total Learning Hours will therefore consist of the GLH *plus* the independent learning hours of the candidate, which is generally 50% – 150% of the GLH.

Qualification Purpose:

The qualification is designed to produce competent personnel capable of processing rice and operating the activity as a business along the processing value chain

UNIT 1: Follow health, safety and environmental practices in fish farming

Unit Reference Number: AQC/FFP/01/L2

QCF Level: 2

Credit Value: 4

Guided Learning Hours: 40hours

Purpose

This unit specifies the competencies required to understand the concept of health, safety and environmental practices in freshwater fish farming in Nigeria. It includes the use of protective clothes, biosecurity measures and general environmental sanitation in farms, proper use and maintenance of farm tools and equipment. This unit standard is intended for those interested in operating small scale fish farm and carrying out associated fish production processes.

1. Entry information

Pre requisite(s):

Unit ID F/001 – Basic literacy

Unit F/002 – Basic numeracy

Special Notes

1. This unit standard is to be delivered and assessed in the context of understanding of the health, safety and environmental practices in fish farming and should be assessed in conjunction with other relevant technical units selected from this domain.
2. To demonstrate competence, at a minimum, evidence is required of the correct interpretation of the health, safety and environmental practices in freshwater fish farming. Perform these tasks ensuring correct application of health, safety and environmental practices in fish rearing.
3. Assessment evidence may be collected from a real workplace or a simulated real workplace or an appropriate simulated realistic environment in which fish farming operations are carried out.
4. All inspection, operation and maintenance procedures associated with the use of tools and equipment shall comply with manufacturers' and company guidelines, instructions, and reasonable flat rate time.

5. Glossary:

"Biosecurity": refers to protection of animals against harm from diseases or from human exploitation.

"Disinfectants": refers to chemicals used in sterilizing floors, equipment (inanimate objects) etc.

"Antiseptic": refers to chemicals used for sterilization of living body (animate objects).

Quality Assurance Requirements

This unit standard and others within this subfield may be awarded by institutions which meet the accreditation requirements set by the National Board for Technical Education and which comply with the national assessment and moderation requirements. Details of specific accreditation requirements and the national assessment arrangements are available from the National Board for Technical Education.

Range:

- Tools for environmental sanitation include but not limited to: Rake, shovel, spade, wheel barrow, head pan, slasher, broom, hand gloves, etc.
- Sources of pollution include but are not limited to human, animal pollution, waste products, litter, rubbish, transport fumes, noise, light pollution
- Sources of human environmental damage includes vandalism, waste dumping, human traffic, tourism, damage by compaction and wear, litter, dog fouling, leisure activities, construction activities, inappropriate agricultural management activities, inappropriate waste disposal methods.
- Measures to minimize human environmental damage include education and training, interpretation boards and notices/signs, prohibition (fencing, limited access, restricted areas), recycling, minimizing consumption and waste products, use of biodegradable materials and products
- Habitats on a fish farm map include but not limited to water courses and wet areas, field margins, ditches, banks and walls
- Common habitat includes but are not limited to water features, woodlands, grassland, hedgerows, moorland, lowland heath, peat bogs
- Habitat maintenance and improvement may include mowing, renovation, planting and staking as applicable, clearing (path, fence line), coppicing, uprooting, hedge maintenance, pruning, thinning, cutting or mowing and mulching, pond, stream and ditch clearance, use of pesticides, herbicides and fertilizer.
- Reduction re-uses and/or recycling of materials may include composting materials that can be composted, re-used and/or recycled, finding alternative uses, methods of recycling, avoid wastage etc.
-

Unit Assessment requirement

Assessment of this unit must be at a real practical work environment, simulation is not allowed unless where indicated.

Unit assessment requirements/evidence requirements

- Observation
- Work Product
- Question and Answer
- Assignment
- Personal Statement
- Recognition of Prior Knowledge

UNIT 01: Follow health, safety and environmental practices in fish farming

LO (Learning outcome)		Criteria:-	Evidence Type				Evidence Ref Page number			
LO1 Practice health and safety rules in fish farming	1.1	State the current health and safety legislation in fish farming								
	1.2	Identify the common hazards in fish farming in Nigeria.								
	1.3	Describe the various ways to minimize hazards in fish farming								
	1.4	Identify key personnel to whom accidents or problems must be reported to								
	1.5	Describe the use of Personal Protective Equipment (PPE) in fish farming								
	1.6	Explain the safe working practices of tools and equipment used in fish farming								
	1.7	Explain safe handling and transportation procedures of fish in accordance with food safety requirements								
	1.8	Select appropriate PPE in freshwater fish farming								
	1.9	Wear appropriate PPE in freshwater fish farming								
	1.10	Prepare various fish farming equipment and/or materials safely and correctly								
	1.11	Use various fish farming equipment and/or materials safely and correctly								
	1.12	Clean tools, equipment and PPE in accordance with laid down procedures								
	1.13	Store tools, equipment and PPE in accordance with laid down procedures								
	1.14	Report incidents, accidents and emergencies to appropriate personnel.								
LO2 Carry out environmental protection and water improvement in fish farming	2.1	Identify sources of pollution in freshwater fish farming.								
	2.2	Describe the potential sources of human environmental damage								
	2.3	Outline the measures used to minimize human environmental damage								
	2.4	Describe methods and resources used for storing and disposing of organic animal wastes								
	2.5	Describe the principles of composting								
	2.6	Outline the legislation that influences waste management								

	2.7	Carry out general environmental protection and water nimpovement in fish farm.								
	2.8	Store of organic waste in accordance with laid down procedures								
	2.9	Dispose of organic waste in accordance with laid down procedures								
LO3 Assist in assessing the significance of environmentally sensitive areas	3.1	Describe the features of habitats that support fish farming.								
	3.2	Explain habitat maintenance in relation to fish farming								
	3.3	Explain the features of habitat maintenance								
	3.4	Describe how composting can be used to manage waste in fish farm								
	3.5	Assist in plotting habitats on a farm map								
	3.6	Assist in assessing common habitats in the locality								
	3.7	Support habitat maintenance in accordance with site management plans.								
	3.8	Improve safety in accordance to site management plans								
	3.9	Assist in the promotion of the reduction, re-use and/or recycling of materials								

Learners Signature:	Date:
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	Date:

Unit 02: Communicate Effectively in Fish Farming Environment

Unit Reference Number: AQC/FFP/02/L2

NVQ Level: 2

Credit Value: 3

Guided Learning Hours: 30

Unit Purpose: This unit is about communication management in Fish Farming Environment

Unit assessment requirements/evidence requirements:

Assessment must be carried out in real workplace environment in which learning and human development is carried out. ***Simulation is not allowed*** in this unit and level.

Assessment methods to be used include:

8. Direct Observation/oral questions (DO)
9. Question and Answer (QA)
10. Witness Testimony (WT)
11. Personal statement (PS) or Reflective Practice (RP)
12. Work Product (WP)
13. Recognition of Prior Learning (RPL)
14. Other methods (O t), assignments, case study, essay, project, etc.

UNIT 02: Communicate Effectively in Fish Farming Environment

LEARNING OUTCOME (LO) The learner will:		PERFORMANCE CRITERIA The learner can:	Evidence Type				Evidence Ref. Page No.			
LO 1: Apply the use of a communication system in a work environment	1.1	Use a verbal means to pass on necessary information								
	1.2	Use non-verbal means to convey necessary information e.g. body language, signs								
	1.3	Interpret symbols and signs appropriately								
LO 2: Source for information in a work environment	2.1	Identify the source of information in the work environment								
	2.2	Relate effectively with the source of information								
	2.3	Apply the different information flow systems in a work environment								
	2.4	Use information gathered to avoid challenges in a work situation								
	2.5	Report findings appropriately in accordance with laid down procedures in the work environment i.e. Cards, Flip Chart								
	2.6	Use simple communication gadget like mobile phones and table phones								
LO 3: Apply various means of communication in a work	3.1	Locate the various communication equipment in the work environment								
		Use effectively the various communication equipment in a work environment								
	3.2	Pass information effectively to the right personnel								
	3.3	Obey instructions in line with ethics of the work environment								
Learners Signature:						Date:				
Assessors Signature:						Date:				
IQA Signature (if sampled)						Date:				
EQA Signature (if sampled)						Date:				

Unit 3: Comply with Organizational Plans and Policies in Fish Farming Enterprises

Unit Reference Number: AQC/FFP/03/L2

NVQ Level: 2

Credit Value: 3

Guided Learning Hours: 30

Unit Purpose: This unit is about Organizational Planning and Policies in Rice Business Enterprises

Unit assessment requirements/evidence requirements:

Assessment must be carried out in real workplace environment in which learning and human development is carried out. ***Simulation is/or is not allowed*** in this unit and level.

Assessment methods to be used include:

1. Direct Observation/oral questions (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Personal statement (PS) or Reflective Practice (RP)
5. Work Product (WP)
6. Recognition of Prior Learning (RPL)
7. Other methods (Ot), assignments, case study, essay, project, etc.

UNIT 03: Comply with Organizational Plans and Policies in Fish Farming Enterprises

LEARNING OUTCOME (LO) The learner will:		PERFORMANCE CRITERIA The learner can:	Evidence Type				Evidence Ref. Page No.			
LO 1: Exhibit positive working relationships with colleagues	1.1	Identify the need for developing positive working relationship with colleagues								
	1.2	Recognize the importance of relating with other people in a way that makes them feel valued and respected								
	1.3	Assist team members when required								
	1.4	Report to the personnel when request for assistance fall outside area of responsibility								
	1.5	Communicate information to colleagues about own work that might affect others								
LO 2: Ability to take responsibility within the team	2.1	Recognize own role and responsibilities within team.								
	2.2	Perform individual tasks in line with the team rules and regulations.								
	2.3	Participate effectively in teamwork.								
LO 3: Comply with organisational policies	3.1	Work in line with organizational standards								
	3.2	Explain organizational code of practice.								
	3.3	Comply with organizational code of practice.								
	3.4	Explain organizational code of conduct								
Learners Signature:			Date:							
Assessors Signature:			Date:							
IQA Signature (if sampled)			Date:							
EQA Signature (if sampled)			Date:							

UNIT 4: Biology of Fishes

Unit reference number: AQC/FFP/004

QCF level: 2

Credit value: 3

Guided learning hours: 30hours

Purpose:

This unit standard specifies the competencies required to demonstrate the understanding of the concept of biology of freshwater fish in Nigeria. It is intended for those interested in operating small scale fish farming and those intended to specialise as fish processors and carrying out associated fish production processes.

1. Entry information

Pre requisite: basic learning and previous knowledge

- Unit ID F/001 – Basic literacy
- Unit ID F/002 – Basic Integrated Science

Special Notes

1. This unit standard is to be delivered and assessed in the context of anatomy and physiology of freshwater fish in Nigeria, and should be assessed in conjunction with other relevant technical units selected from this domain.
2. To demonstrate competence, at a minimum, evidence is required of the correct interpretation of understanding the different fish body systems and their functions in relation to fishing in water medium. Perform these tasks ensuring correct identification of circulatory, digestive, reproductive, nervous, sensory and respiratory systems of freshwater fish in Nigeria.
3. Assessment evidence may be collected from a real workplace or a simulated real workplace or an appropriate simulated realistic environment in which fish farming operations are carried out.
4. All inspection, operation and maintenance procedures associated with the use of tools and equipment shall comply with manufacturers' and company guidelines, instructions, and reasonable flat rate time.
5. Glossary:
 - "*Dorsal Fin*: backside": (top) fin on a fish; used for balance and protection.
 - "*External Anatomy*": The outside body parts, such as, fins, scales, mouth.
 - "*Gills*": Organ used to obtain oxygen from the water and get rid of carbon dioxide.

- “*Gonads*”: The male and female reproductive organs.
- “*Lateral Line*”: is an organ located below the dorsal fin and used to detect vibration in the water bodies.

6. Regulations and legislation relevant to this unit standard include the following:

- Nigerian constitution and Land use act 1978
- Agriculture promotion policy (2016 – 2020)
- NESREA (National environmental standard & regulation enforcement agency) Act 2007 (section 7)
- Security exchange commission (SEC) – investment and security Act 2007.
- Agriculture promotion policy: 2016-2020
- Inland fisheries Act, CAP 110, LFN, 2004.
- Water resources Act, CAP W2, LFN, 2004.
- Nigeria agro-processing and food safety commission bill, 2012.
- WHO (2006), guidelines on safe use of waste water and excreta in aquaculture, volume 1. Policy and regulation aspects.
- NAFDAC (National Agency for Food and Drug Administration and Control) **ACT** CAP, N1 LFN, 2004.

Range

Range: Included but not limited to; freshwater fish

External organs: Fins (dorsal, pectoral, pelvic and anal), mouth, tail (caudal fin), nostril, operculum, scales, lateral line etc.

Functions of external anatomical features of fish

Internal organs: Kidney, liver, heart, stomach, intestines, pancreas, brain, sex organs (eggs/milt), lungs, swim bladder etc.

Functions of internal organs of fish

Body systems: Digestive, circulatory, reproductive, endocrine, sensory, excretory and respiratory.

Identification of external features of male fishes

Identification of external features of female fishes

Identification of different fish species

Unit Assessment requirement:

Assessment of this unit must be at a real practical work environment, simulation is not allowed unless where indicated.

Unit assessment requirements/evidence requirements

- Observation
- Work Product
- Question and Answer
- Assignment
- Personal Statement
- Recognition of Prior Knowledge

Unit 4: Biology of Fish

LO (Learning outcome)		Performance Criteria:-	Evidence Type				Evidence Ref Page number			
LO1 Outline the anatomy of fish	1.1	Identify major external anatomical organs of freshwater fish								
	1.2	Outline the major internal organs in freshwater fish.								
	1.3	List the different body systems in freshwater fish								
	1.4	Dissect a freshwater fish to identify its internal organs.								
	1.5	Locate the different body systems in a dissected fish								
LO2 Describe the physiology of fish	2.1	State the external anatomical features of fish swimming activities.								
	2.2	Outline the function of swim bladder in fish								
	2.3	Differentiate between the functions of the various systems in freshwater fish								
	2.4	Explain the functions of different external features of fish.								
	2.5									
	2.6									
LO3 Distinguish between the sexes of fresh water fish	3.1	List the characteristics of external features male species								
	3.2	List the characteristics of external features female species								
	3.3	Differentiate between the external features of male and female fishes								
	3.4	Identify male papilla in fish								
	3.5	Locate the male and female reproductive organ in live fish								
LO4 Carry out classification of fish species	4.1	Name different fresh water fish species								
	4.2	List the identifying features for different fish classification								
	4.3	Identify species of fresh water fish using external features of a live fish								

Learners Signature:

Date:

Assessors Signature:

Date:

IQA Signature (if sampled)

Date:

EQA Signature (if sampled)

Date:

UNIT 5: Methods of Fish Seed Production

Unit reference number:

QCF level: 2

Credit value: 4

Guided learning hours: 40hours

Purpose

This unit specifies the competencies required to demonstrate the understanding of fish seed production. It include the understanding of the basic structures, materials and methods used in freshwater fish seed reproduction processes. The unit is intended for those who are interested in operating small scale fish farms and carrying out associated production processes.

1. Entry information

Pre requisite:

- Unit ID F/001 - Basic literacy
- Unit ID F/002 – Basic Numeracy
- Unit ID F/003 – Basic Integrated Science
- Unit ID 003 – Health and Safety

Special Notes

1. This unit standard is to be delivered and assessed in the context of fish production cycle and breeding, and should be assessed in conjunction with other relevant technical units selected from this domain.
2. To demonstrate competence, at a minimum, evidence is required of the correct understanding of fish production cycle and breeding in freshwater fish. Perform these tasks ensuring correct understanding of the various processes in fish production. It also includes understanding of natural and artificial breeding (fertilization, incubation, hatching and rearing), brood stock selection, propagation methods and various structures and materials used in fish breeding, harvesting as well as marketing of the fish seeds to table size (Adult). Perform these tasks ensuring correct identification of facilities and tools as well as proper use of appropriate drugs and hormones.
3. Assessment evidence may be collected from a real workplace or a simulated real work place or an appropriate simulated realistic environment in which fish rearing operations are carried out.

4. All inspection, operation and maintenance procedures associated with the use of tools and equipment shall comply with manufacturers' and company guidelines, instructions, and reasonable flat rate time.
5. Glossary of terms:
 - *"Synthetic hormones"*: inorganic hormones produced commercially
 - *"Stripping"*: squeezing of eggs from breed stock female fish
 - *"Hatchlings"*: (baby fish) are about 5-7mm in size and weight about 1.2 – 3.0mg.
 - *"Carrying capacity"*: The optimum number of fish a culture media can contain
 - *"Stocking density"*: The number of fish stocked in a culture media
 - *"Sorting"*: Isolation and separation of fishes based on their sizes
6. Regulations and legislation relevant to this unit standard include the following:
 - Nigerian constitution and Land use act 1978
 - Agriculture promotion policy (2016 – 2020)
 - NESREA (National environmental standard & regulation enforcement agency) Act 2007 (section 7)
 - Security exchange commission (SEC) – investment and security Act 2007.
 - Agriculture promotion policy: 2016-2020
 - Inland fisheries Act, CAP 110, LFN, 2004.
 - Water resources Act, CAP W2, LFN, 2004.
 - Nigeria agro-processing and food safety commission bill, 2012.
 - WHO (2006), guidelines on safe use of waste water and excreta in aquaculture, volume 1. Policy and regulation aspects.
 - NAFDAC (National Agency for Food and Drug Administration and Control) **ACT** CAP, N1 LFN, 2004.
 - and any amendments to the above

Range:

- Fingerling Production include but are not limited to: brood stock selection, inducement with hormone, collection of milt, natural or artificial fertilization, incubation, hatching and collection of hatchlings, rearing of the hatchlings to fingerling stage.
- **Products:** seed production (Fingerlings, juveniles),
- **Methods:** Natural and Artificial
- **Structures:** Brood stock pond, hatchery units, nursery units, and fingerlings production ponds.
- **Hormones:** human urine, (human pregnant woman), pituitary extract and synthetic hormones (ovulin, ovatide and ovaprim).
- **Facilities used in hatchery operations such as:**
 - Incubators, Aerators, Hormones, Hapas, Needle and Syringes, Bowls, Saline Solutions, Kakaban (Egg tray), Scooping Net, Thermostat heater.

Unit Assessment requirement

Assessment of this unit must be at a real practical work environment, simulation is not allowed unless where indicated.

Unit assessment requirements/evidence requirements

- Observation
- Work Product
- Question and Answer
- Assignment
- Personal Statement
- Recognition of Prior Knowledge

UNIT 5: Methods of Fish Seed Production

LO (Learning outcome)		Criteria:-	Evidence Type				Evidence Ref Page number			
LO 1 Describe materials used in hatchery operations.	1.1	Explain the differences between indoor and outdoor hatchery								
	1.2	Explain the use of different hormones in fish reproduction process								
	1.3	Outline the various structures used in fish reproduction								
	1.4	Explain the use of Kakaban (egg tray) in hatchery operations.								
	1.5	Identify the different hormones used in artificial reproduction in fresh water fish farming.								
	1.6	Select suitable broodstock for artificial reproduction.								
	1.7	Carry out stripping and fertilization of eggs in hatchery.								
	1.8	Perform the extraction of pituitary extract from male fish.								
	1.9	Practice health and safety precautions in hatchery operations in accordance with workplace guidelines.								
	1.10	Measure the appropriate dosage of the hormone for inducing selected gravid fish (i.e. female fish that carry ripe eggs).								
	1.11	Demonstrate the use of Kakaban (egg tray) in hatchery operations								
LO 2 Describe methods of fish seed (fingerlings) production										
	2.1	Explain the differences between natural and artificial fertilization.								
	2.2	Describe the process of artificial fertilization in fish farming								
	2.3	Describe the process of inducing female broodstock								
	2.4	Describe the processes of incubation and hatching in freshwater fish production.								
	2.5	Outline the various products obtainable from fish seed production.								
	2.6	Explain the various processes involved in rearing fish seeds.								
	2.7	Explain the process of brood stock handling.								
	2.8	Describe the behavior of a brood stock after hormonal treatment								
	2.9	Apply health and safety in brood stock handling in accordance with laid down procedures								
	2.10	Outline the importance of broodstock production in fish seed production								

	2.11	Record data in brood stock handling in accordance with laid down procedures								
	2.12	Report data in brood stock handling in accordance with laid down procedures								
LO3 Design fish seed production cycle	3.1	List the components involved in fish seed production cycle namely, <ul style="list-style-type: none"> - capacity of the facilities (fish tank) - Parent stock - Hormone requirement - Feed requirement - Time frame - 								
	3.2	Explain the importance of the factors in 3.1.								
	3.3	Outline fingerlings production cycle								
	3.4	Plan the time frame of fingerling production to meet the target market demand								
	3.5	Carry out appropriate feeding regime in the fingerling production cycle								
	3.6	Use appropriate feed size in the fingerling production cycle								
	LO 4 Recondition female brood stock									
		Explain the meaning of reconditioning of spent broodstock								
		Explain the importance of reconditioning spent broodstock								
		Describe the process of reconditioning of spent broodstock								
		Identify the materials used for reconditioning spent broodstock								
		Carry out the process of reconditioning of spent broodstock								
		Return recovered spent broodstock to the appropriate for another phase of fish seed production.								

Learners Signature:

Date:

Assessors Signature:

Date:

IQA Signature (if sampled)

Date:

EQA Signature (if sampled)

Date:

UNIT 6: Facilities and Resources used in Table size fish production

Unit reference number:

QCF level: 2

Credit value: 4

Guided learning hours: 40hours

Purpose

This unit specifies the competencies required to understand the concept of the facilities and resources used in freshwater fish farming in Nigeria. It refers to competency in understanding the different types of facilities, equipment and tools used in fish farming. This unit is intended for those interested in operating small scale fish farming and carrying out associated processes.

1. Entry information

Pre requisite(s):

Unit ID F/001 - Basic literacy

Unit ID 003 – Health and Safety

Special Notes

1. This unit standard is to be delivered and assessed in the context freshwater fish facilities, equipment and tools used, and should be assessed in conjunction with other relevant technical units selected from this domain.
2. To demonstrate competence, at a minimum, evidence is required of the correct understanding of the common freshwater fish facilities, equipment and tools used in Nigeria. Perform these tasks ensuring correct identification and understanding of the facilities type and designs, tools and equipment used, consumables, farming systems as well as different methods of rearing freshwater fish.
3. Assessment evidence may be collected from a real workplace or a simulated real workplace or an appropriate simulated realistic environment in which fish farming operations are carried out.
4. All inspection, operation and maintenance procedures associated with the use of tools and equipment shall comply with manufacturers' and company guidelines, instructions, and reasonable flat rate time.
5. Glossary of terms:

- *“Mono-culture”*: rearing of only one type of fish species.
 - *“Poly-culture”*: rearing of more than one type of fish species.
 - *“Mono-sex”*: rearing of either male or female fish species.
6. Regulations and legislation relevant to this unit standard include the following:
- Nigerian Constitution and Land use act 1978
 - Agriculture Promotion Policy (2016 – 2020)
 - NESREA (National Environmental Standard & Regulation Enforcement Agency) Act 2007 (section 7)
 - Security Exchange Commission (SEC) – Investment and Security Act 2007.

Quality Assurance Requirements

This unit standard and others within this subfield may be awarded by institutions which meet the accreditation requirements set by the National Board for Technical Education and which comply with the national assessment and moderation requirements. Details of specific accreditation requirements and the national assessment arrangements are available from the National Board for Technical Education.

Range:

Facilities include but not limited to; Pond (concrete, earthen, plastic, collapsible), pen, cage, re-circulatory system, etc.

Pond water source: Rivers, lake, stream, well, bore hole, etc.

Farming systems: Extensive, intensive and semi-intensive.

Rearing methods: Mono-culture, poly-culture, mono-sex and integrated

• **Equipment:** Automatic feeder, kits (water quality), thermometer, aerator, sechi disc, PH meter, oven, smoking kiln, miller, pelletizer, refrigerator etc.

• **Tools:** Fishing nets, plastic buckets, working table, cooler, weighing scale, hatching mat, incubation tray, mortar and pestle, grinder, towel etc.

• **Consumables:** Hand gloves, drugs, hormones, saline water, feed, binder, syringe kerosene, charcoal etc.

• **Equipment:** Automatic feeder, kits (water quality), thermometer, aerator, set disc, PH meter, oven, smoking kiln, miller, pelletizer, refrigerator etc.

• **Tools:** Fishing nets, plastic buckets, working table, cooler, weighing scale, hatching mat, incubation tray, mortar and pestle, grinder, towel etc.

• **Consumables:** Hand gloves, drugs, hormones, saline water, feed, binder, syringe kerosene, charcoal etc

Unit Assessment requirement

Assessment of this unit must be at a real practical work environment, simulation is not allowed unless where indicated.

Unit assessment requirements/evidence requirements

- Observation
- Work Product
- Question and Answer
- Assignment
- Personal Statement
- Recognition of Prior Knowledge

UNIT 6: Facilities and Resources used in Table size fish production

LO (Learning outcome)		Criteria:-	Evidence Type				Evidence Ref Page number			
LO 1 Demonstrate the ability to design and construct common facilities for freshwater fish farming in Nigeria	1.1	List common facilities used in fish farming namely; Ponds (concrete, earthen, plastic, collapsible), pen, cage, re-circulatory system, etc.								
	1.2	Describe the various designs of facilities used in freshwater fish farming in Nigeria								
	1.3	Construct earthen pond for small scale fish production in Nigeria.								
	1.4	Identify the different sources of water for fish farming								
	1.5	Explain the advantages and disadvantages of the different sources of water for fish farming.								
	1.6	Relate the designs and selection of the facilities to the sources of water								
LO 2 Demonstrate the use of common facilities in freshwater fish farming in Nigeria										
	2.1	Describe the different fish farming systems based on the level of input used.								
	2.2	Explain the advantages and disadvantages of the different fish farming systems								
	2.3	Explain recirculatory system of fish production								
	2.4	Carry out monoculture practice in fish farming system								
2.5	Carry out polyculture practice in fish farming system									
LO3 Demonstrate the use of tools, equipment and consumables in fish farming										
	3.1	List the tools, equipment and consumables used in fish farming.								
	3.2	Explain the functions of tools and equipment and consumables used in freshwater fish farming.								
	3.3	Explain the uses of consumables in freshwater fish farming								
	3.4	Apply appropriate safety precautions while using tools and equipment in fish farming								
	3.5	Use appropriate tools, equipment and consumables for specified fish farming activity.								
LO 4										
	4.1	List steps involved in maintenance of fish farming tools after use								

Perform maintenance practices of different tools and equipment used in fish farming in Nigeria.	4.2	List steps involved in maintenance of fish farming equipment after use								
	4.3	Carry out maintenance practice on specified tools used on a fish farm in accordance with manufacturer's specifications.								
	4.4	Carry out maintenance practice on specified equipment used on a fish farm in accordance with manufacturer's specifications								

Learners Signature:	Date:
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	Date:

UNIT 7: Formulation, Processing and Storage of Fish Feed

Unit reference number:

QCF level: 2

Credit value: 4

Guided learning hours: 40hours

Purpose:

This unit standard specifies the competencies required to demonstrate understanding of the concept of fish feed formulation, processing methods and feed types in Nigeria. It includes sourcing of fish feed ingredients, types, forms of fish feed and storage practices. The unit is intended for those interested in operating small scale fish feed milling industries and associated fish feed milling processes.

1. Entry information

Pre requisite:

Unit ID F/001 - Basic literacy

Unit ID F/002 - Basic numeracy

Unit ID F/003 – Basic integrated science

Unit ID 002 – Biology of fish

Unit ID 003 – Health and Safety

Special Notes

1. This unit standard is to be delivered and assessed in the context of fish feed formulation and feeding in freshwater fish farming in Nigeria, and should be assessed in conjunction with other relevant technical units selected from this domain.
2. To demonstrate competence, at a minimum, evidence is required of the good understanding of fish feed formulation techniques in fish farming. Perform these tasks ensuring correct understanding of the basics in fish feed formulation, feed ingredients, level of protein and energy requirement in fish and correct identification of various forms and types of feed available in fish farming.
3. Assessment evidence may be collected from a real workplace or a simulated real workplace or an appropriate simulated realistic environment in which fish farming operations are carried out.
4. All inspection, operation and maintenance procedures associated with the use of tools and equipment shall comply with manufacturers' and company guidelines, instructions, and reasonable flat rate time.

5. Glossaries

- *“Ration”*: Quantity or amount of feeds to be given to fish daily.
- *“Ingredients”*: Feed items used in compounding of animal ration.
- *“Supplements”*: Feed items added to replace the nutrients deficient in a ration.
- *“Additives”*: refers to any ingredient added to the feed that add value and palatability to the feeds.
- *“Enzymes”* any complex chemical produced by living cells that is a biochemical catalyst

6. Regulations and legislation relevant to this unit standard include the following:

- Nigerian constitution and Land use act 1978
- Agriculture promotion policy (2016 – 2020)
- NESREA (National environmental standard & regulation enforcement agency) Act 2007 (section 7)
- Security exchange commission (SEC) – investment and security Act 2007.
- Agriculture promotion policy: 2016-2020
- Inland fisheries Act, CAP 110, LFN, 2004
- Water resources Act, CAP W2, LFN, 2004
- Nigeria agro-processing and food safety commission bill, 2012
- WHO (2006), guidelines on safe use of waste water and excreta in aquaculture, volume 1. Policy and regulation aspects
- NAFDAC (National Agency for Food and Drug Administration and Control) **ACT** CAP, N1 LFN, 2004
- And any subsequent amendments to the above.

Quality Assurance Requirements

This unit standard and others within this subfield may be awarded by institutions which meet the accreditation requirements set by the National Board for Technical Education and which comply with the national assessment and moderation requirements. Details of specific accreditation requirements and the national assessment arrangements are available from the National Board for Technical Education.

Learning Outcomes and Performance Criteria

Learning Outcome 1: Understand feed formulation in fish farming

Range: Included but not limited to intensive, semi-intensive and extensive system.

Natural feeds: Zooplanktons, phytoplankton, micro and macro flora.

Ingredients/ Sources:

- ✓ **Animal protien sources;** Fish meal, maggots, poultry (litter, intestinal part and feathers), intestine, and blood meal
- ✓ **Plant protien sources;** soyabean (meal and cake), Bambara groundnut, cotton seed (meal and cake); groundnut cake, and cotton seed cake.
- ✓ **Energy source:** yellow maize, millet, sorghum, yellow maize, and cassava.
- ✓ **Fiber:** wheat bran, and Rice bran.

Energy requirement: Herbivores (higher), omnivores (lower) and carnivores (lowest)

Protein requirement: Herbivores (lowest), omnivores (lower) and carnivores (higher)

Supplements: Protein, carbohydrate and additives (pigments, enzymes table salt vitamin premix, and amino acids; (lysine, methionine).

Feed forms: Mash/powder and pellets (different sizes; 0.2mm, to 12mm)

Feed types: Floating, semi-sinking and sinking.

Feeding methods: Spot feeding, broadcasting and automatic feeding machine.

Performance Criteria**Unit Assessment requirement**

Assessment of this unit must be at a real practical work environment, simulation is not allowed unless where indicated.

Unit assessment requirements/evidence requirements

- Observation
- Work Product
- Question and Answer
- Assignment
- Personal Statement
- Recognition of Prior Knowledge

UNIT 7: Formulation, Processing and Storage of Fish Feed

LO (Learning outcome)		Criteria:-	Evidence Type				Evidence Ref Page number			
LO 1 Demonstrate knowledge of sources of fish feed ingredients	1.1	List different types of fish feed ingredients								
	1.2	Classify fish feed ingredients into different nutrient sources (i.e. carbohydrates, protein, fat and oil, vitamins, etc)								
	1.3	Differentiate fish feed ingredients into animal and plant sources								
	1.4	Identify fish feed ingredients of animal sources								
	1.5	Identify fish feed ingredients of plant sources.								
	1.6									
LO 2 Process fish feed using different methods	2.1	List different methods of processing fish feed ingredients								
	2.2	Describe different methods used in processing fish feed ingredients								
	2.3	Explain the effects of each method of processing fish feed ingredients on the feed.								
	2.4	Process any raw material of groundnut, soybeans, fish, palm kernel seeds as fish feed ingredients								
	2.5									
LO3 Classify fish feed into different types and forms	3.1	List different forms in which fish feed are produced.								
	3.2	Identify different forms in which fish feed are produced								
	3.3	Differentiate types of fish feed based on stability in water								
	3.4	Differentiate types of fish feed based on floatability in water								
LO 4 Formulate fish feed using locally available fish feed ingredients	4.1	List different methods of feed formulation								
	4.2	Describe Pearson's square method of feed formulation								
	4.3	List locally available fish feed ingredients in Nigeria								
	4.4	Explain balanced ration in fish feed formulation								
		Fish feed using Pearson's square methods								
LO 5 Prepare fish feed using appropriate methods	5.1	Describe various methods used in the preparation of fish feed								
	5.2	Explain effects of each method of feed preparation on the feed and the fish								
	5.3	Apply health and safety rules in the preparation of fish feed								

	5.4	Outline the procedures involved in the preparation of fish feed.								
	5.5	Identify the tools and equipment used in preparation of fish feed (e.g. shovel, bowls, scale, grinder-hammer mill, mixer., pelleting machine)								
	5.6	Identify various forms of feed produced.								
LO 6										
Carry out packaging and storage of prepared feed	6.1	Differentiate between packaging and storage of fish feed								
	6.2	Demonstrate package of prepared fish feed								
	6.3	Package feed in accordance to acceptable standard								
	6.4	Label each pack of feed in accordance to acceptable standard								
	6.5	Explain the requirements for fish feed storage								
	6.6	Keep detailed records of stored fish feeds								
LO 7										
Classify fish feed ingredients into nutrient sources	7.1	List fish feed ingredients that are mainly for energy source								
	7.2	List fish feed ingredients that are for protein source								
	7.3	List fish feed ingredients that are mainly of vitamins and minerals sources source								
	7.4	Define feed additives								
	7.5	Identify energy source of fish feed ingredients								
	7.6	Identify protein source of fish feed ingredients								
	7.7	Identify mineral and vitamin source of fish feed ingredients.								

Learners Signature:	Date:
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	Date:

UNIT 8: Safe handling and transportation of freshwater fish in Nigeria

Purpose

This unit standard specifies the competencies required to demonstrate the understanding safe handling and transportation of live fish in Nigeria. It includes fish culture, safe handling, adequate oxygen supply, and effective means of transport facilities. This unit standard is intended for those who are interested in operating small scale fish farms and carrying out associated fish transportation processes.

2. Entry information

Pre requisite:

- Unit ID F/001 - Basic literacy
- Unit ID F/002 - Basic numeracy
- Unit ID 003 – Health and Safety

Special Notes

1. This unit standard is to be delivered and assessed in the context of safe handling and transportation systems in fresh water fish farming and should be assessed in conjunction with other relevant technical units selected from this domain.
2. To demonstrate competence, at a minimum, evidence is required of the correct understanding of fish safe handling and transportation systems. Perform these tasks ensuring correct understanding of the various processes in fish culture, daily, weekly and monthly routine practices. It also includes understanding of adequate oxygen supply, and effective means of transport facilities.
3. Assessment evidence may be collected from a real workplace or a simulated real workplace or an appropriate simulated realistic environment in which freshwater fish production operations are carried out.
4. All inspection, operation and maintenance procedures associated with the use of tools and equipment shall comply with manufacturers' and company guidelines, instructions, and reasonable flat rate time.
5. Glossary of terms:
 - *“Carrying capacity”*: The optimum number of fish a culture media can contain
 - *“Stocking density”*: The number of fish stocked in a culture media
 - *“Sorting”*: Isolation and separation of fishes based on their sizes
 - *“Dissolved oxygen”*: refers to the liquidified oxygen used by fish for respiration

- “*Agitation*”: refers to stirring of water during transport
- “*pH meter*”: refers to instrument use in measuring acidity and alkalinity of water during fish transport.
- “*Thermometer*”: refers to instrument use in measuring degree of hotness and coldness of water during fish transport.

6. Regulations and legislation relevant to this unit standard include the following:

- Nigerian constitution and Land use act 1978
- Agriculture promotion policy (2016 – 2020)
- NESREA (National environmental standard & regulation enforcement agency) Act 2007 (section 7)
- Security exchange commission (SEC) – investment and security Act 2007.
- Agriculture promotion policy: 2016-2020
- Inland fisheries Act, CAP 110, LFN, 2004.
- Water resources Act, CAP W2, LFN, 2004.
- Nigeria agro-processing and food safety commission bill, 2012.
- WHO (2006), guidelines on safe use of waste water and excreta in aquaculture, volume 1. Policy and regulation aspects.
- NAFDAC (National Agency for Food and Drug Administration and Control) **ACT** CAP, N1 LFN, 2004.

Range:

Processes: Liming, Fertilization, Feeding, monitoring of water quality, fish growth monitoring, etc.

Culture practices include:

- ***Daily routine:*** Turbidity, water PH, dissolved oxygen, water temperature, removal of pollutant, record keeping.
- ***Weekly routine:*** Change of pond water, possible pond leakage.
- ***Monthly routine:*** Environmental sanitation, cross checking of pond bottom, angles/corners, walls/dykes, sorting of fish.
- Various antibiotics and antistress include but not limited to: fish biotics, fish care, Aquacrine.
- Use of aerators, use of oxygen bag, monitoring of water temperature,
- Use of appropriate equipment during transportation,
- Use of appropriate means of transportation of fish
- Different fish size required different stocking rate
- Different delivery area (distance) required different stocking rate and transport facilities.

Unit Assessment requirement

Assessment of this unit must be at a real practical work environment, simulation is not allowed unless where indicated.

Unit assessment requirements/evidence requirements

- Observation
- Work Product
- Question and Answer
- Assignment
- Personal Statement
- Recognition of Prior Knowledge

UNIT 8: Safe handling and transportation of freshwater fish in Nigeria.

LO (Learning outcome)		Criteria:-	Evidence Type				Evidence Ref Page number			
LO 1 Explain various routine fish cultural practices.	1.1	Outline daily cultural routine practiced on the fish farm								
	1.2	Mention weekly cultural routine practiced on the fish farm								
	1.3	Mention monthly cultural routine practiced on the fish farm								
	1.4	Classify the following routine cultural practices (sorting, record keeping, repair of damaged structures, feeding)								
	1.5	Identify instrument for measuring water quality parameter								
	1.6	Measure one water quality parameter using appropriate instrument								
	1.7	Design record keeping for different routine fish cultural practices								
	1.8	Identify common fish predators in a fish farm.								
	1.9	Demonstrate one cultural measure for keeping predator away from a fish pond								
LO 2 Describe safe fish handling during culture	2.1	Explain the processes involved in safe handling of live freshwater fish								
	2.2	Outline the importance of proper fish handling in hatchery								
	2.3	State the importance of proper fish handling in growout pond								
	2.4	Describe appropriate fish harvest process								
	2.5	Describe sorting method in fish farming								
	2.6	Identify precautionary measures taken during handling of freshwater fish								
	2.7	Carry out safe handling of juveniles from hatchery to rearing points (grow out ponds)								
LO3 Demonstrate understanding of fish health during transportation	3.1	List the causes of diseases and mortality of fish during transportation								
	3.2	State all the requirements to provide effective transport of fish to new place								
	3.3	State the safety measures in fish transportation								
	3.4	List the effects of poor stocking in fish transportation								
	3.5	List equipment used in transporting fish								
	3.6	Outline the various means of transporting fish								

	3.7	Identify the duration of changing water during transportation.								
	3.8	Identify dead fish during transportation process								
	3.9	Remove dead fish from the transportation facilities								
	3.10	Identify various antibiotics and antistress to prevent diseases and mortality in fish								
	3.11	Group fish based on their level of tolerance to transportation process								
	3.12	Perform hygienic practices during live fish transportation								
LO 4 Provide appropriate care to fish during transportation										
	4.1	Explain the use of clean oxygenated water during fish transportation								
	4.2	List antibiotics that can be used during fish transportation								
	4.3	Mention anti-stress that can be used during fish transportation								
	4.4	Explain the processes involved in changing of water during fish transportation								
	4.5	Explain the use of ice to control the temperature of water during transportation of fish								
	4.6	Identify signs of dissolved oxygen deflection in fish transport								
	4.7	Practice safety measures in fish transportation.								
	4.8	Prepare the transportation facilities using disinfectants								
	4.9	Conduct agitation of water during transportation of live fish								
	4.10	Introduce ice to the water appropriately to control temperature of water during fish transportation.								
	4.11	Measure the temperature and the amount of dissolved oxygen in water used during transportation of fish.								

Learners Signature:	Date:
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	Date:

Unit 9: Fish Health Condition in Fresh Water Fish Culture

Unit Reference Number:

QCF Level: 1

Credit Value: 3

Guided Learning Hours: 30

Purpose

This unit standard specifies the competencies required to demonstrate the understanding of the concept of fish health. It includes disease causative agents, classification of diseases, basic rules for disease prevention and control, and identification of diseased fish. This unit standard is intended for those interested in operating small scale fish farming and carrying out associated fish production processes.

1. Entry information

Pre requisite(s):

- Unit ID F/001 – Basic literacy
- Unit ID 002 – Biology of fish

Special Notes

1. This unit standard is to be delivered and assessed in the context of fish health and should be assessed in conjunction with other relevant technical units selected from this domain.
2. To demonstrate competence at a minimum, evidence is required of the good understanding of disease causing organisms, classification of disease, treatment and control, and disease prevention in fish farming. Perform these tasks ensuring correct identification of various diseases in freshwater fish.
3. Assessment evidence may be collected from a real workplace or a simulated real workplace or an appropriate simulated realistic environment in which fish farming operations are carried out.
4. All inspection, operation and maintenance procedures associated with the use of tools and equipment shall comply with manufacturers' and company guidelines, instructions, and reasonable flat rate time.
5. Glossary of terms:
 - *"Pathogens"*: organisms that are capable of causing disease
 - *"Host"*: refers to organisms that gives room for others to generate nourishment from another and still cause harm to them.
 - *"Parasite"*: are any organism that lives and generate nourishment from another and still cause harm to the host.
 - *"Infectious disease"*: disease that can be transmitted from one host to another.
 - *"Nutritional deficiency"*: inability of fish body to have the required Nutrient at a desirable proportions.
6. Regulations and legislation relevant to this unit standard include the following:
 - Nigerian constitution and Land use act 1978
 - Agriculture promotion policy (2016 – 2020)
 - NESREA (National environmental standard & regulation enforcement agency) Act 2007 (section 7)
 - Security exchange commission (SEC) – investment and security Act 2007.
 - Agriculture promotion policy: 2016-2020
 - Inland fisheries Act, CAP 110, LFN, 2004.
 - Water resources Act, CAP W2, LFN, 2004.
 - Nigeria agro-processing and food safety commission bill, 2012.
 - WHO (2006), guidelines on safe use of waste water and excreta in aquaculture, volume 1. Policy and regulation aspects.
 - NAFDAC (National Agency for Food and Drug Administration and Control) **ACT** CAP, N1 LFN, 2004.
 - And any subsequent amendment to the above.

7. Range:

Included but not limited to;

- **Causative agents:** Virus, bacteria, fungus, parasite, protozoa and nutrition.
- **Classification:** Infectious and non-infectious
- **Disease identification:** includes but not limited to;
 - External appearance: swollen stomach, skin rupture, tail and fins colouration, gills rotten etc.
 - Fish behaviour: poor growth, sluggish movement, hanging up, rubbing each other, and mortality.
 - Sample collection: scraping of the infected parts of the fish (slime from skin, and gills) and observe under microscope.
 -
 - Post-mortem examination: dissection of fish immediately after dead, observation of the internal organs, etc.
- **Basic rules:** includes but not limited to;
 - **Prevention:** Good nutrition, good stocking density, proper water quality monitoring, proper fish handling and isolation of infected fish.
 - **Control:** regular changing of water, stress in fish, mixing of fish from other pond
- **Treatment:** Dipping in a solution of Formalin (external bacteria and protozoa), bacteriostatic, potassium permanganate (fungus), sodium chloride (gill worms)

Unit assessment requirements/evidence requirements:

Assessment must be carried out in real workplace environment in which learning and human development is carried out. ***Simulation is allowed*** in this unit and level.

Assessment methods to be used include:

1. Direct Observation/oral questions (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Work Product (WP)
5. Recognition of Prior Learning (RPL)
6. Simulation
7. Other methods (Ot), assignments, case study, essay, project, etc.

Unit 9: Fish Health Condition in Fresh Water Fish Culture

LEARNING OUTCOME (LO)		PERFORMANCE CRITERIA	Evidence Type				Evidence Ref. No.	Page No.
The learner will:		The learner can:						
LO 1: Explain disease conditions commonly found in freshwater fish	1.1	Describe the different diseases commonly found in fresh water fish						
	1.2	Outline the different causative agents of disease in fresh water fish						
	1.3	Describe how to identify a diseased fish in terms of their behaviour and external appearance						
	1.4	List tools suitable for collection of samples from different parts of diseased fish for microscopic examination.						
	1.5	Differentiate between infectious and non-infectious diseases in fresh water fish.						
	1.6	Identify an infected freshwater fish						
	1.7	Collect samples properly from the actual infected parts in the fish						
	1.8	Isolate the infected fresh water fish from non-infected ones.						
		Transfer infected fresh water fish to different zones for subsequent appropriate treatment or disposal.						
LO 2: Carry out prevention and control of common freshwater fish diseases	2.1	Name common freshwater fish disease conditions (e.g fin rot, white spot disease, boils, etc)						
	2.2	Classify common fish diseases based on their causative agents (i/e fungi, bacteria, virus, etc)						
	2.3	Explain basic rules to be observed in prevention and control of fresh water fish diseases and parasites.						
	2.4	Explain preventive measures that can be used to avoid disease outbreak in a fish farm.						
	2.5	Describe methods of prevention and control of fresh water fish diseases e.g. screening, use of wet mat, quarantine, dipping, etc						
	2.6	Apply appropriate measures to prevent named freshwater fish disease in a fish farm						
	2.7	Control named freshwater fish disease in a fish farm using appropriate method.						

LEARNING OUTCOME (LO)		PERFORMANCE CRITERIA	Evidence Type				Evidence Ref. Page No.			
The learner will:		The learner can:								
LO 3: Carry out treatment of freshwater fish diseases	3.1	Identify disease condition common in fresh water fish								
	3.2	List drugs/chemicals used in treatment of fresh water fish.								
	3.3	Mention Drug/chemical suitable for treating a named fresh water fish disease								
	3.4	Explain appropriate dosage of drug/chemical to be used in treatment of named fresh water fish disease condition in line with manufacturer's guide								
	3.5	Prepare appropriate dosage of drug/chemical for treatment of s named fresh water fish disease.								
	3.6	Carry out treatment of a diseased fish using appropriate treatment procedures.								
	3.7	Apply the appropriate safety rules and regulations during medication to the infected fish.								

Learners Signature:	Date:
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	Date:

Unit 10: Fish Post Harvest Handling, Processing and Preservation in Nigeria

Unit Reference Number: /

QCF Level: 1

Credit Value: 3

Guided Learning Hours: 30

Unit Purpose:

This unit is aimed to build competencies of the candidate in observing safe working practices in the leather work environment, use correct personal protective equipment and ensure fire prevention.

Unit assessment requirements/evidence requirements:

Assessment must be carried out in real workplace environment in which learning and human development is carried out. ***Simulation is allowed*** in this unit and level.

Assessment methods to be used include:

1. Direct Observation/oral questions (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Work Product (WP)
5. Recognition of Prior Learning (RPL)
6. Simulation
7. Other methods (Ot), assignments, case study, essay, project, etc.

Unit 10: Fish Post Harvest Handling, Processing and Preservation in Nigeria

LEARNING OUTCOME (LO)		PERFORMANCE CRITERIA	Evidence Type					Evidence Ref. Page No.	
The learner will:		The learner can:							
LO 1: Carry out pre-harvest operations in fish farm	1.1	Explain the processes undertaken prior to fish harvesting (e.g starving the fish at least 24 hours prior to harvest, gradual draining of pond water volume)							
	1.2	Explain the reasons for each process undertaken prior to harvesting							
	1.3	Carry out pre harvest operations in fish pond							
LO 2: Carry out fish harvesting in fish ponds	2.1	Explain the forms of fish harvesting namely: - partial harvesting, and - total harvesting							
	2.2	Differentiate between partial and total harvesting							
	2.3	Identify various types of gear used in fish harvesting							
	2.4	Conduct fish pond harvesting using different harvesting gears							
LO 3: Carry out maintenance of gears after harvesting	3.1	Explain the reasons for carrying out fishing gear maintenance after harvesting of fish							
	3.2	Outline the steps involved in the maintenance of fishing gear after harvesting of fish							
	3.3	Wash fishing gears after harvesting of fish							
	3.4	Hang fishing gear for drying							
	3.5	Check for tears on the fishing gears							
	3.6	Mend the fishing gears where necessary							
	3.7	Keep the fishing gear appropriately for future use							
LO 4: Carry out post harvest handling and processing of fish	4.1	List post harvest handling procedures of fish (e.g. cutting, gutting, splitting, filleting, washing)							
	4.2	Explain post harvest handling procedures of harvested fish listed in 4.1.							
	4.3	List tools commonly used in post harvest handling of fish							

LEARNING OUTCOME (LO)		PERFORMANCE CRITERIA	Evidence Type				Evidence Ref. Page No.			
The learner will:		The learner can:								
	4.4	Identify tool used in post harvest handling of fish								
	4.5	Demonstrate how to gut fresh fish after harvesting								
	4.6	Carry out post harvest handling of fish								
LO 5: Preserve harvested fish	5.1	List different methods of preserving harvested fish (e.g. Smoking, Salting, Icing, Sun drying, Icing, Canning, Frying)								
	5.2	Describe the procedures for carrying out specific methods of preserving harvested fish								
	5.3	Carry out salting and smoking of fish for preservation								
	5.4	Carry out salting and sun drying of fish for preservation								
	5.5	Assemble and refrigerate fish for preservation..								
LO 6: Carry out packaging, labelling and storage of fish	6.1	List ,materials that can be used for packaging processed fish								
	6.2	Describe process of packaging processed fish for storage and/ or marketing.								
	6.3	Carry out fish packaging for storage and/ or marketing								
	6.4	Explain the reason of labelling of packaged fish								
	6.5	State the information contained on the label of packaged fish (e.g Date of processing, Species of fish, Net weight, etc)								
	6.6	Label packaged fish appropriately for storage and/ or marketing.								
	6.7	Store packaged and labelled fish appropriately.								

Learners Signature:	Date:
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	Date:

Unit 11: Market and Marketing Strategies of fresh water fish in Nigeria

Unit Reference Number:

QCF Level: 2

Credit Value: 3

Guided Learning Hours: 30

Purpose

This unit specifies the competencies required to demonstrate the understanding of the concept of fresh water fish marketing channels and marketing constraints in Nigeria. It includes the distribution of fresh water fish stock in Nigeria. This unit is intended for those interested in operating small scale fish farming and carrying out associated production processes.

1. Entry information

Pre requisite(s)

- Unit ID 001 – Basic literacy and numeracy
- Unit ID 002- Fish biology
- Unit ID 004- Fish safe handling and transportation
- Unit ID 005 – Fish production cycle and breeding
- Unit ID 007- fish preservation and processing in Nigeria.

Special Notes

1. This unit standard is to be delivered and assessed in the context of freshwater fish harvesting, processing and preservation in Nigeria, and should be assessed in conjunction with other relevant technical units selected from this domain.
2. To demonstrate competence, at a minimum, evidence is required of the correct interpretation of understanding different market size and marketing channels, as well as major factors influencing fish marketing in Nigeria.
3. Assessment evidence may be collected from a real workplace or a simulated real workplace or an appropriate simulated realistic environment in which fish farming operations are carried out.
4. All inspection, operation and maintenance procedures associated with the use of tools and equipment shall comply with manufacturers' and company guidelines, instructions, and reasonable flat rate time.

5. Glossary:
- “*Demand*”: The level of desire or need that exists for particular goods or services.
- “*Supply*”: to give, sell, or make available something that is wanted or needed by somebody or something.
- “*Commodity*”: An item that is bought and sold, especially an unprocessed material
- “*Channel*”: places and area where the fish will be sold.
- “*Price*”: the amount, usually of money, that is offered or asked for when something is bought or sold.
6. Regulations and legislation relevant to this unit standard include the following:
- Nigerian constitution and Land use act 1978
 - Agriculture promotion policy (2016 – 2020)
 - NESREA (National environmental standard & regulation enforcement agency) Act 2007 (section 7)
 - Security exchange commission (SEC) – investment and security Act 2007.
 - Agriculture promotion policy: 2016-2020
 - Inland fisheries Act, CAP 110, LFN, 2004.
 - Water resources Act, CAP W2, LFN, 2004.
 - Nigeria agro-processing and food safety commission bill, 2012.
 - WHO (2006), guidelines on safe use of waste water and excreta in aquaculture, volume 1. Policy and regulation aspects.

NAFDAC (National Agency for Food and Drug Administration and Control)
ACT CAP, N1 LFN, 2004

Unit assessment requirements/evidence requirements:

Assessment must be carried out in real workplace environment in which learning and human development is carried out. ***Simulation is allowed*** in this unit and level.

Assessment methods to be used include:

1. Direct Observation/oral questions (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Work Product (WP)
5. Recognition of Prior Learning (RPL)
6. Simulation
7. Other methods (Ot), assignments, case study, essay, project, etc.

Unit 11: Market and Marketing Strategies of fresh water fish in Nigeria

LEARNING OUTCOME (LO)		PERFORMANCE CRITERIA	Evidence Type				Evidence Ref. Page No.			
The learner will:		The learner can:								
LO 1: Demonstrate knowledge of the market for freshwater fish.	1.1	Identify fish market in your locality								
	1.2	List different forms in which fish are sold in the market e.g dry fish, smoked fish, sun dried fish								
	1.3	State different species of fish sold in the market								
	1.4	Explain different fish market in your locality (e.g. open market, super market, cold room) and the form of fish sold in each.								
	1.5	Identify the forms of fish sold in each fish market listed in 1.4.								
	1.6	Locate retail fresh, frozen, and live fish in the locality								
	1.7	Select and carry some harvested fresh and preserved fish to local fish market for sale								
	1.8	Carry some harvested fresh and preserved fish to local fish market for sale.								
	1.9	Apply food safety practices in the handling and selling of fish products								
LO 2: Explain fresh water fish marketing strategies in Nigeria	2.1	Identify what determines the fish marketing success in Nigeria.								
	2.2	Explain the different marketing channels based on the people involved in fish marketing								
	2.3	Outline the food safety requirements in marketing of fish.								
	2.4	Describe the major factors that influence fish marketing in Nigeria								
	2.5	Identify major factors that leads to price fluctuation of fish products								
LO 3: Demonstrate knowledge of constraints of fish marketing in Nigeria	3.1	Outline the major marketing constraints in fish farming								
	3.2	State factors that lead to constraints in fish marketing <ul style="list-style-type: none"> - access to the market, - language barrier, - illiteracy, - lack of information, - Advertisement - Poor infrastructure - Shortage of supply - Price fluctuation - Spoilage in transit etc 								

LEARNING OUTCOME (LO)		PERFORMANCE CRITERIA	Evidence Type					Evidence Ref. Page No.						
The learner will:		The learner can:												
	3.3	Explain Unfriendly marketing policy eg. Economic, political and socio factors												
	3.4	Identify availability of alternatives to fish as protein source from other agricultural sectors.												

Learners Signature:	Date:
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	Date: