



Competency Standard (CS)

Aquaculture

Level-3

Agriculture Sector

Competency Standard Code: CS-AGRI-AC-L3-EN-V1



**National Skills Development Authority
Prime Minister's Office
Government of the People's Republic of Bangladesh**

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This Competency Standard for **Aquaculture** is a document for the development of curricula, teaching and learning materials, and assessment tools. It also serves as the document for providing training consistent with the requirements of industry in order to meet the qualification of individuals who graduated through the established standard via competency-based assessment for a relevant job.

Public and private institutions may use the AGRInformation contained in this standard for activities benefitting Bangladesh.

Introduction

The NSDA aims to enhance an individual's employability by certifying completeness with skills. NSDA works to expand the skilling capacity of identified public and private training providers qualitatively and quantitatively. It also aims to establish and operationalize a responsive skill ecosystem and delivery mechanism through a combination of Well-defined set of mechanisms and necessary technical supports.

Key priority economic growth sectors identified by the government have been targeted by NSDA to improve current job skills along with existing workforce to ensure required skills to industry standards. Training providers are encouraged and supported to work with industry to address identified skills and knowledge to enable industry growth and increased employment through the provision of market responsive inclusive skills training program. " **Aquaculture**" is selected as one of the priority occupations of **Agriculture** Sector. This standard is developed to adopt a demand driven approach to training with effective inputs from Industry Skills Councils, employer associations and employers.

Generally, a competency standard AGRIorms curriculum, learning materials, assessment and certification of trainees enrolled in Skills Training. Trainees who successfully pass the assessment will receive a qualification in the Bangladesh National Qualification Framework (BNQF) and will be listed on the NSDA's online portal.

This competency standard is developed to improve skills and knowledge in accordance with the job roles, duties and tasks of the occupation and ensure that the required skills and knowledge are aligned to industry requirements. A series of stakeholder consultations, workshops were held to develop this document.

The document also details the format, sequencing, wording and layout of the Competency Standard for an occupation which is comprised of Units of Competence and its corresponding elements.

Overview

A **Competency Standard** is a written specification of the knowledge, skills and attitudes required for the performance of an occupation, trade or job corresponding to the industry standard of performance required in the workplace.

The purpose of a competency standards is to:

- provide a consistent and reliable set of parts for training, recognising and assessing people's skills, and may also have optional support materials
- enable industry recognised qualifications to be awarded through direct assessment of workplace competencies
- encourage the development and delivery of flexible training which suits individual and industry requirements
- encourage learning and assessment in a work-related environment which leads to verifiable workplace outcomes

Competency standards are developed by a working group comprised of occupation specific experts, academicians, representatives from NSDA and ISC to identify the competencies required of an occupation in **Agriculture Sector**.

Competency standards describe the knowledge, skills and attitude needed to perform effectively in the workplace. CS acknowledge that people can achieve technical and vocational competency in many ways by emphasising what the learner can do, not how or where they learned to do it.

With competency standards, training and assessment may be conducted at the workplace or at training institute or any combination of these.

Competency standards consist of a number of units of competency. A unit of competency describes a distinct work activity that would normally be undertaken by one person in accordance with industry standards.

Units of competency are documented in a standard format that comprises of:

- unit title
- nominal duration
- unit code
- unit descriptor
- elements and performance criteria
- variables and range statement
- curricular content guide
- assessment evidence guides

Together, all the parts of a unit of competency:

- describe a work activity
- guide the assessor to determine whether the candidate is competent or not yet competent

The ensuing sections of this document comprise of a description of the relevant occupation, trade or job with all the key parts of a unit of competency, including:

- a chart with an overview of all Units of Competency for the relevant occupation, trade or job including the Unit Codes and the Unit of Competency titles and corresponding Elements
- the Competency Standard that includes the Unit of Competency, Unit Descriptor, Elements and Performance Criteria, Range of Variables, Curricular Content Guide and Assessment Evidence Guide.

.Competency Standards for National Skill Certificate – 3 in

Aquaculture, Agriculture Sector

Level Descriptors of Skills Sector, BNQF Level 1-6

Level & Job classification	Knowledge Domain	Skills Domain	Responsibility Domain
6-Mid-Level Manager/ Sub Assistant Engineer	Comprehensive actual and theoretical knowledge within a specific work or study area with an awareness of the validity and limits of that knowledge, able to analyse, compare, relate and evaluate.	Specialised and wider range of cognitive and practical skills required to provide leadership in the development of creative solutions to defined problems. Communicate professional issues and solutions to the team and to external partners/users.	Work under broad guidance and self-motivation to execute strategic and operational plan/s. Lead lower-level management. Diagnose and resolve problems within and among work groups.
5-Supervisor	Broad knowledge of the underlying, concepts, principles, and processes in a specific work or study area, able to scrutinize and break AGRIformation into parts by identifying motives or causes.	Broad range of cognitive and practical skills required to generate solutions to specific problems in one or more work or study areas. Communicate practice-related problems and possible solutions to external partners.	Work under guidance of management and self-direction to resolve specific issues. Lead and take responsibility for the work and actions of group/team members. Bridge between management.
4-Highly Skilled Worker	Broader knowledge of the underlying, concepts, principles, and processes in a specific work or study area, able to solve problems to new situations by comparing and applying acquired knowledge.	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying the full range of methods, tools, materials and AGRIformation. Communicate using technical terminology and IT technology with partners and users as per workplace requirements.	Work under minimal supervision in specific contexts in response to workplace requirements. Resolve technical issues in response to workplace requirements and lead/guide a team/ group.
3-Skilled Worker	Moderately broad knowledge in a specific work or study area, able to perceive ideas and abstract from drawing and design according to workplace requirements.	Basic cognitive and practical skills required to use relevant AGRIformation in order to carry out tasks and to solve routine problems using simple rules and tools. Communicate with his team and limited external partners upholding the values, nature and culture of the workplace	Work or study under supervision with considerable autonomy. Participate in teams and responsible for group coordination.
2-Semi Skilled Worker	Basic understanding of underpinning knowledge in a specific work or study area, able to interpret and apply common occupational terms and instructions.	Skills required to carry out simple tasks, communicate with his team in the workplace presenting and discussing results of his work with required clarity.	Work or study under supervision in a structured context with limited scope of manipulation
1 –Basic Skilled Worker	Elementary understanding of ability to interpret the underpinning knowledge in a specific study area, able to interpret common occupational terms and instructions.	Specific Basic skills required to carry out simple tasks. Interpret occupational terms and present the results of own work within guided work environment/ under supervision.	Work under direct supervision in a structured context with limited range of responsibilities.

List of Abbreviations

NSDA	- National Skills Development Authority
CS	- Competency Standard
SCVC	- Standard and Curriculum Validation Committee
ISC	- Industry Skills Council
CBLM	- Competency Based Learning Material
UoC	- Unit of Competency
PPE	- Personal Protective Equipment
OSH	- Occupational Safety and Health
CBC	- Competency Based Curriculum
AGRI	- Agriculture Sector
AC	- Aquaculture
CNC	- Computer and Numerical Control
BNQF	- Bangladesh National Qualification Framework
STP	- Skills Training Provider
SOP	- Standard Operating Procedure
UoC	- Unit of Competency
4 IR	- 4th Industrial Revolution

Approved by
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**Competency Standards for National Skill Certificate – 3 in
Aquaculture
Course Structure**

SL	Unit Code and Title		UoC Level	Nominal Hours
Generic Units of Competencies				55
1.	GU-01-L1-V1	Perform Computations Using Basic Mathematical Concepts	1	15
2.	GU-04-L1-V1	Work in the Team Environment	1	15
3.	GU-15-L4-V1	Develop Entrepreneurship Skills	4	25
Sector Specific Units of Competencies				40
4.	SU- AGRI -01-L2-V1	Apply Safety Measures Based on Aquaculture Operations	3	15
5.	SU- AGRI -02-L2-V1	Interpret Technology System of Aquaculture	3	25
Occupation Specific Units of Competencies				260
6.	OU- AGRI -AC-01-V1	Conduct Pre-Operational Aquaculture Activities	3	50
7.	OU- AGRI -AC-02-V1	Prepare and Maintain Aquaculture Facilitie	3	50
8.	OU- AGRI -AC-03-V1	Culture Fish in Cage	3	30
9.	OU- AGRI -AC-04-V1	Culture Fish in Ponds	3	50
10.	OU- AGRI -AC-05-V1	Culture Fish in Tanks	3	40
11.	OU- AGRI -AC-06-V1	Culture Fish in Poly Ponds	3	40
Total Nominal Hours				355

Units & Elements at a Glance:

Generic Unit of Competency -55 Hrs.

Code	Unit of competency	Elements of competency	Nominal Hours
GU-01-L1-V1	Perform Computations Using Basic Mathematical Concepts	1. Identify calculation requirements in the workplace 2. Select appropriate mathematical methods for the calculation. 3. Use tool/instrument to perform calculations	15
GU-04-L1-V1	Work in the Team Environment	1. Define team role and scope 2. Identify individual role and responsibility 3. Participate in team discussions 4. Work as a team member	15
GU-15-L4-V1	Develop Entrepreneurship Skills	1. Recognize concept of entrepreneurship 2. Explain functions of entrepreneur 3. Explain role of entrepreneur in economic development 4. Plan for business and marketing 5. Explain small business 6. Interpret reasons of failure and success in small business.	25
Total Hours			55

Sector Specific Units of Competencies (40 Hours)

Code	Unit of competency	Elements of competency	Nominal Hours
SU-AGRI-03-L3-V1	Apply Safety Measures Based on Aquaculture Operations	1. Follow OSH procedure 2. Use aquaculture tools, equipment and materials safely 3. Follow biosecurity and biosafety 4. Maintain cleanliness and store tools and equipment	15
SU-AGRI-04-L3-V1	Interpret Technology System of Aquaculture	1. Prepare for aqua-farming 2. Interpret aquaculture technology system 3. Identify aquaculture technology equipment 4. Perform Preventive maintenance	25
Total hours			40

Occupation Specific Unit of Competencies – 260 Hours

Code	Unit of Competency	Elements of Competency	Nominal Hours
OU-AGRI-AC-01-L3-V1	Conduct Pre-Operational Aquaculture Activities	1. Select site 2. Facilitate water source for aquaculture 3. Monitor suitability of water and soil 4. Prepare aquaculture infrastructure facilities 5. Secure facilities 6. Collect gears, equipments and machineries.	50
OU-AGRI-AC-02-L3-V1	Prepare and Maintain Aquaculture Facilities	1. Evaluate site 2. Draw and design the lay-out plan 3. Carry-out construction and installation of facilities 4. Maintain facilities	50
OU-AGRI- AC-03-L3-V1	Culture Fish in Cage	1. Prepare for cage culture 2. Set up cage 3. Collect and Stock fingerlings 4. Execute feed management 5. Control disease 6. Harvest fish	30
OU- IS -AC-04-L3-V1	Culture Fish in Ponds	1. Evaluate site 2. Prepare pond for culture 3. Collect and Stock fingerlings 4. Execute feed management 5. Control disease 6. Harvest fish	50
OU-AGRI-AC-05-L3-V1	Culture Fish in Tanks	1. Evaluate site 2. Prepare tank for culture 3. Collect and Stock fingerlings 4. Execute feed management 5. Maintain waterparameter 6. Control disease 7. Harvest fish	40
OU-AGRI-AC-06-L3-V1	Culture Fish in Poly Ponds	1. Select site 2. Prepare poly pond for culture	40

		3. Collect and Stock fingerlings 4. Perform feed management 5. Control disease 6. Harvest fish	
Total hours			260

Generic Unit of Competenceis

Unit Code and Title	GU-01-L1-V1: Perform Computations Using Basic Mathematical Concepts
Unit Descriptor	This unit of competency requires the knowledge, skills and attitude to perform computations using basic mathematical concepts in the workplace. It specifically includes the tasks of identifying calculation requirements in the workplace, selecting appropriate mathematical method/concept for the calculation and using appropriate instruments tools to perform calculation.
Nominal Hours	15 Hours
Elements of Competency	Performance Criteria Bold & Underlined terms are elaborated in the Range of Variables Training Components
1. Identify calculation requirements in the workplace	1.1 Job requirements are identified; 1.2 <u>Measurements</u> are selected in accordance with job requirement; 1.3 Calculation requirements are identified from <u>workplace AGRIformation</u> ;
2. Select appropriate mathematical methods for the calculation.	2.1 Mathematical methods are identified; 2.2 <u>Appropriate method</u> is selected to carry out the calculation requirements; 2.3 Tolerance and clearance limits are identified and adjusted according to the job requirements;
3. Use tool/instrument to perform calculations	3.1 Work instructions are confirmed and applied to the job in hand; 3.2 Materials to be measured are identified as per job specification; 3.3 Appropriate <u>tool/ instrument</u> is selected based on materials to be measured;
Range of Variables	
Variable	Range (may include but not limited to)
1. Measurements	1.1 Length 1.2 Width 1.3 Weight 1.4 Volume 1.5 Tolerance
2. workplace Information	2.1 Job Order 2.2 Design 2.3 Working drawing 2.4 Verbal instructions 2.5 Written Instruction
3. Appropriate method	3.1 Addition

	3.2 Subtraction 3.3 Division 3.4 Multiplication 3.5 Conversion 3.6 Percentage and ratio calculation
4. Tool/ Instrument	4.1 Calculator 4.2 Scale 4.3 Measuring tape 4.4 Marker
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical Aspects of Competency	Assessment required evidence that the candidate: 1.1 Identified calculation requirements from workplace AGRIformation 1.2 Selected appropriate method to carry out the calculation requirements 1.3 Selected measurements 1.4 Selected appropriate methods 1.5 Used tool/instrument 1.6 Added numbers 1.7 Subtracted numbers 1.8 Multiplied numbers. 1.9 Divided numbers. 1.10 Completed calculations using appropriate tools/instruments
2. Underpinning Knowledge	2.1. Numerical concept 2.2. Basic mathematical methods such as addition, subtraction, multiplication and division and percentage. 2.3. Mathematical language, symbols and terminology. 2.4. Measuring units
3. Underpinning Skills	3.1 Interpreting numerical concept 3.2 Interpreting mathematical methods such as addition, subtraction, multiplication and division and percentage. 3.3 Interpreting mathematical language, symbols and terminology. 3.4 Interpreting measuring units.
4. Underpinning Attitudes	4.1. Commitment to occupational health and safety 4.2. Environmental concerns 4.3. Eagerness to learn 4.4. Tidiness and timeliness 4.5. Respect for rights of peers and seniors in workplace 4.6. Communication with peers and seniors in workplace

5. Resource Implications		5.1. Work place 5.2. Materials relevant to the proposed activity 5.3. All tools, equipment, material and documentation required. 5.4. Relevant specifications or work instructions
6. Methods of Assessment	of	Assessment methods may include but not limited to: 6.1. Written Test 6.2. Demonstration 6.3. Oral Questioning 6.4. Portfolio
7. Context of Assessment	of	7.1 Competency assessment must be done in a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by an NSDA certified/ nominated assessor
Accreditation Requirements Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.		

Unit Code and Title	GU-04-L1-V1: Work in the Team Environment
Unit Descriptor	This unit covers the knowledge, skills and attitudes (KSA) to work in the team environment. It includes the tasks of defining team role and scope, identifying individual role and responsibility. participating in team discussions and working as a team member.
Nominal Hours	15 Hours
Elements of Competency	Performance Criteria <u>Bold & Underlined</u> terms are elaborated in the Range of Variables
1. Define team role and scope	1.1. Role and objectives of the team are defined; 1.2. Team structure, responsibilities and reporting relations are identified from team discussions and other external sources.
2. Identify individual role and responsibility	2.1 Individual roles and responsibilities of <u>team members</u> are identified; 2.2 Reporting relationships among team members are defined and clarified; 2.3 Reporting relationships external to the team are defined and clarified;
3. Participate in team discussions	3.1 Ideas related to team plans are contributed; 3.2 Recommendations for improving team work are put forward.
4. Work as a team member	4.1. Effective forms of communication are used to interact with team members; 4.2. Communication channels are followed; 4.3. OHS practices are followed.
Range of Variables	
Variables	Range (may include but not limited to):
1. Sources of Information	1.1 Standard operating procedures 1.2 Job description 1.3 Operations manual 1.4 Organizational structure
2. Team Members	2.1 Coach/mentor 2.2 Supervisor/manager 2.3 Peers/colleagues 2.4 Employee representative
3. Workplace context	3.1 National laws and statutes 3.2 Standard operating procedures 3.3 Workplace rules and regulations
Evidence Guide	

The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	
1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 Defined team role and scope 1.2 Identified individual role and responsibility 1.3 Participated in team discussions 1.4 Worked as a team member
2. Underpinning knowledge	2.1 Team structure, role and responsibility 2.2 Individual members' roles and responsibilities 2.3 Communication flow and reporting structures 2.4 Team planning 2.5 Interpersonal communication skills 2.6 Team meeting procedures 2.7 Ohs practices
3. Underpinning skills	3.1 Identifying the role and responsibility of the team 3.2 Identifying roles and responsibilities of individual members 3.3 Participating in team discussions 3.4 Working as a team member
4. Underpinning Attitudes	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace 4.6 Communication with peers and seniors in Workplace
5. Resource implications	5.1 Pens 5.2 Telephone 5.3 Computer 5.4 Writing materials 5.5 Online communication
6. Methods of assessment	Assessment methods may include but not limited to: 6.1. Demonstration 6.2. Oral questioning 6.3. Written test 6.4. Portfolio
7. Context of assessment	7.1 Competency assessment must be done in a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by a NSDA certified/nominated assessor
Accreditation Requirements Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to	

conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

Unit Code and Title	GU-15-L4-V1: Develop Entrepreneurship Skills
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to develop entrepreneurship skills. It specially includes the task of recognizing concept of entrepreneurship, functions of entrepreneur explaining role of entrepreneur in economic development, planning for business and marketing, explaining small business and Interpreting reasons of failure and success in small business.
Nominal Hours	25 Hours
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables
1. Recognize concept of Entrepreneurship	1.1 Entrepreneurship is defined; 1.2 Advantages of entrepreneurship is discussed; 1.3 Strength, Weakness, Opportunity and Threat (SWOT) is analyzed for business; 1.4 Methods of operating salon in profitable manner is discussed; 1.5 Importance of controlling expenses and cost saving methods is discussed; 1.6 The units of sale for different types of services are Identified; 1.7 Future prospects of business are Identified.
2. Explain functions of Entrepreneur	2.1 Important aspects of business including selection business place, services to render & monetary matters are discussed; 2.2 Different business situation and importance of compiling data regarding clients, income, expenses are discussed; 2.3 Goals for sales of business is identified; 2.4 Source and way of financing in small business is identified; 2.5 Method for building a professional team is discussed.
3. Explain role of Entrepreneur in Economic Development	3.1 Plan to play vital role to boost economy by creating and providing new job opportunities are discussed; 3.2 Method to develop hiring plan as per need of business and importance of depositing contributions in government departments are discussed; 3.3 Methods to generate maximum profits and expansion plan of business is discussed;
4. Plan for Business and marketing	4.1 Business plan is prepared as per market demands; 4.2 Areas of business or services which are more profitable and popular in clients are identified; 4.3 Services and products offered by the competitors is analyzed and business strategy is made accordingly; 4.4 Estimate of finance is prepared for required business;

	4.5 Methods for attaining knowledge of current market trends are discussed.
5. Explain small business	5.1 Small business is defined; 5.2 Money management and cash flows are explained; 5.3 Importance of customer satisfaction is discussed; 5.4 Customers comfort policies is explained; 5.5 Importance of maintenance of record of purchases, sales, inventory and list of regular customers are explained; 5.6 Branding of business is explained; 5.7 Methods to build team of honest workers on long term basis are explained.
6. Interpret reasons of failure and success in small business	6.1 Fields of business causing loss is identified; 6.2 Key factor for selection of proper suitable location of business place easily accessible is discussed for customers; 6.3 Factors annoying customers by action of workers are Identified; 6.4 Control of utility bills especially turning off extra lights and ACs when client is not in service discussed; 6.5 Importance to make purchases of best items keeping in view quality, quantity and prices are explained; 6.6 Communicate with the customers in effective conversation and good relations are discussed; 6.7 Time schedule is prepared for self-workers and services.
Range of Variables	
Variables	Range (may include but not limited to):
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical Aspects of Competency	Assessment required evidence that the candidate: 1.1 Recognized concept of entrepreneurship 1.2 Functioned of entrepreneur 1.3 Explained role of entrepreneur in economic development 1.4 Planned for business and marketing 1.5 Explained small business 1.6 Interpreted reasons of failure and success in small business
2. Underpinning Knowledge	2.1 Cost saving methods. 2.2 Factors for forecasting of future market trends 2.3 Planning techniques for rates and location identification for better business opportunities. 2.4 Importance of client's data and skills for efficient financial controls of business. 2.5 Techniques for increasing sales of business 2.6 Importance of team building.

	2.7 Importance of appropriate and suitable work 2.8 Force for the business, prevailing labor laws and prevailing taxes levied on the business. 2.9 Important factors for expansion plan according to demand and supply position prevailing in market. 2.10 Market trends 2.11 Profitable and popular services of business. 2.12 Procedure of implementation of business and marketing plan 2.13 Capital requirements for business. 2.14 Possible sources of finance 2.15 Techniques of money management. 2.16 Importance of customer's satisfaction and demands of clients 2.17 Importance of customer's comfort level in terms of prices and services. 2.18 Techniques of maintaining records of purchases, sales and client's data. 2.19 Major fields of business causing loss. 2.20 Importance of easily accessible location for setting up business. 2.21 Importance of good behavior of workers with the customers. 2.22 Methods of cost saving steps in salon. 2.23 Method of purchases of materials competitively and cost efficiently 2.24 Importance of pleasant communication skills. 2.25 Importance of time management and the role of proper time
3. Underpinning Skills	3.1 Applying skills of communicating 3.2 Applying skills of literacy and numeracy 3.3 Analyzing business environment 3.4 Planning for own business 3.5 Using the effective tools to make presentations 3.6 Identifying business places 3.7 Identifying target customers 3.8 Maintaining business plan 3.9 Handling business promoting media and equipment
4. Required Attitudes	4.1 Commitment to occupational health and safety 4.2 Promptness in carrying out activities 4.3 Sincere and honest to duties 4.4 Environmental concerns 4.5 Eagerness to learn 4.6 Tidiness and timeliness 4.7 Respect for rights of peers and seniors in workplace 4.8 Communication with peers and seniors in workplace

5. Resource Implications		5.1 Workplace (actual or simulated) 5.2 Fire extinguisher 5.3 Uninterrupted power supply 5.4 Internet facilities 5.5 Adequate Surveillance devices 5.6 Manuals, catalogs and magazine 5.7 Competency Based Learning Materials (CBLM)Internet facilities
6. Methods Assessment	of	Assessment methods may include but not limited to: 6.1 Written test 6.2 Demonstration 6.3 Oral questioning 6.4 Portfolio
7. Context Assessment	of	7.1 Competency assessment must be done in a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by NSDA certified/ nominated assessor
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Sector Specific Unit of Competencies

Unit Code and Title	SU-AGRI-03-L3-V1: Apply Safety Measures Based on Aquaculture Operations
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to apply safety measures in farm operations. It specifically includes the tasks of following OSH procedure, using aquacultural tools, equipment and materials safely, following biosecurity measure for safety and maintaining cleanliness and store tools and equipment.
Nominal Hours	15 Hours
Elements of Competency	Performance Criteria <u>Bold & Underlined</u> terms are elaborated in the Range of Variables
1. Follow OSH procedure	1.1 <u>Personal protective equipment (PPE)</u> is collected and worn as required; 1.2 PPE is maintained to keep them operational and compliant with OSH regulations; 1.3 <u>Hazards</u> and risks are identified and controlled; 1.4 Incidents arising from hazards and risks are reported to relevant person; 1.5 Workplace <u>emergency procedures</u> are followed; 1.6 First aid procedures is applied during emergency situations.
2. Use aquaculture tools, equipment and materials safely	2.1 Necessary <u>tool and equipment</u> are identified and collected as per work requirement; 2.2 Tools and equipment are used as per workplace procedure following OSH; 2.3 <u>Materials</u> are selected and used as per work requirement; 2.4 Tools and equipment are handled in safe manner.
3. Follow biosecurity and biosafety	3.1 Fencing is applied to protect external intervention; 3.2 Personal hygiene is maintained to work in different ponds as per workplace standard; 3.3 Harmful (Shading and leaf falling) trees are not planted around the pond; 3.4 Equipments are used in different ponds after proper disinfection; 3.5 Water leakaging is controlled on dykes and from one pond to other ; 3.6 Fry/Fingerlings are cured and acclimatized before stocking them in pond; 3.7 Water inlet and outlet facilities are provided to supply and drain water following effluent compliance.
4. Maintain cleanliness and store tools and equipment	4.1 Used tools and outfit are cleaned and stored in hygienic and designated areas; 4.2 Unused materials are properly labeled and stored according to manufacturers recommendation;

	4.3 <u>Waste materials</u> are disposed according to manufacturers' guidelines, government and farm requirements.
Range of Variables	
Variables	Range (may include but not limited to):
1. Personal Protective Equipment (PPE)	1.1 Hand Gloves 1.2 Safety boots 1.3 Face mask 1.4 Goggles 1.5 Apron
2. Hazards	2.1 Chemical hazards 2.2 Biological hazards 2.3 Physical Hazards 2.4 Mechanical and Electrical Hazard 2.5 Mental hazard 2.6 Ergonomic hazard
3. Emergency procedures	3.1 Fire fighting 3.2 Earthquake 3.3 Flash flood 3.4 Lightening 3.5 Medical and first aid 3.6 Isolation 3.7 Decontamination
4. Tools and equipment	4.1 Tools ▪ Spade ▪ Hose pipes ▪ Filter net ▪ Water screen nets ▪ Harvesting nets (Cast, Seine, Push) ▪ Measuring tape ▪ Measuring Scale ▪ Knife/cutter ▪ Salinometer ▪ Thermometer ▪ Water pH meter ▪ Soil pH meter ▪ DO meter ▪ TDS meter ▪ Hardness meter ▪ Water testing kit ▪ Alkalinity meter ▪ Bucket ▪ Basket

	▪ Mug ▪ Belcha ▪ Shovel ▪ Cutting pliers ▪ Scissor ▪ Calculator ▪ Weighing scale (kitchen) ▪ Weighing scale (commercial) ▪ Garvage bins 4.2 Equipment ▪ Different types of net ▪ Airetor ▪ Submersible water pumb ▪ Irrigation water pump ▪ Generator ▪ Control panel ▪ Auto feeder ▪ Boat ▪ Secchi disc
5. Materials	5.1 Bamboo 5.2 Rod 5.3 Polythene 5.4 Net 5.5 Rope 5.6 Geobag 5.7 Geomembrane liner 5.8 Geotextile fabrics 5.9 Fertilizers 5.10 Different types of Lime 5.11 Clip board 5.12 Record Keeping board 5.13 Probotics 5.14 Prebiotics 5.15 Plastic pipe/PVC pipe 5.16 Pplythine pipe
6. Environmental issues	6.1 Soil Erosion 6.2 Landslide 6.3 Pesticide and Herbicide Use 6.4 Loss of Biodiversity 6.5 Greenhouse Gas Emissions 6.6 Over-extraction of Water 6.7 Land Degradation 6.8 Waste Generation

	6.9 Excessive rain 6.10 Less rain 6.11 Temperature fluctuation 6.12 Discharged waste water
7. Waste materials	7.1 Animal manure 7.2 Waste polythene liner and nets 7.3 Garveges 7.4 Used packing bags and cans 7.5 Unused farm chemicals and fertilizers 7.6 Expired reagents 7.7 Dead fish 7.8 Dead animals 7.9 Pond bottom sludge/black soil
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	
1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 Followed OSH procedure 1.2 Used aquacultural tools, equipment and materials safely 1.3 Followed biosecurity measures for safety 1.4 Maintained cleanliness and store tools and equipment
2. Underpinning knowledge	2.1 Define OSH 2.2 Work safety procedures 2.3 Emergency procedures 2.4 Different types of hazards 2.5 PPE and there uses 2.6 Personal hygiene practices 2.7 OSH awareness 2.8 Contingency measures 2.9 Good Aquaculture practices 2.10 List of tool and equipment 2.11 Use of aquaculture tools and equipment 2.12 Necessity of using fencing 2.13 Aquaculuture waste materials 2.14 Safe handling of tools and equipment 2.15 Biosecurity measures
3. Underpinning skills	3.1 Using PPE 3.2 Identifying hazards 3.3 Responding to emergency procedure 3.4 Handling tools and equipment safely 3.5 Following biosafety procedure 3.6 Maintaining personal hygiene

	3.7 Communication skills 3.8 Presentation skills 3.9 Problem solving skills 3.10 Keeping record
4. Required attitude	4.1 Commitment to occupational health and safety 4.2 Sincere and honest to duties 4.3 Promptness in carrying out activities 4.4 Environmental concerns 4.5 Eagerness to learn farm operation 4.6 Tidiness and timeliness 4.7 Respect of peers and seniors in workplace 4.8 Communicate with peers and seniors in workplace
5. Resource implications	5.1 Workplace/Farm 5.2 Tools, equipment and facilities appropriate to the process or activity. 5.3 Materials relevant to the proposed activity. 5.4 Outfits appropriate in applying safety measures. 5.5 Internet facilities 5.6 Record book 5.7 Manuals, catalogs and magazine 5.8 Competency Based Learning Materials (CBLM)
6. Methods of assessment	Assessment methods may include but not limited to: 6.1 Written test 6.2 Demonstration 6.3 Oral questioning 6.4 Portfolio
7. Context of assessment	7.1 Competency assessment must be done in a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by a NSDA certified/nominated assessor.
Accreditation Requirements Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.	

Unit Code and Title	SU-AGRI-04-L3-V1: Interpret Technology System of Aquaculture
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to use farm tools and equipment. It specifically includes the tasks of preparing for work, interpreting aquaculture technology system, identifying aquaculture technology equipment and performing preventive maintenance
Nominal Hours	25 Hours
Elements of Competency	Performance Criteria <u>Bold & Underlined</u> terms are elaborated in the Range of Variables
1. Prepare for aqua-farming	1.1 <u>Personal protective equipment (PPE)</u> is collected and used as required; 1.2 <u>Hazards</u> and risks are identified and controlled;
2. Interpret aquaculture technology system	2.1 Aquaponic system is interpreted for growing fish along with fruits and vegetable as biproduct by reusing water; 2.2 Poly pond bottom clean race way system is interpreted to protect fish from disease and multi yield increased production ; 2.3 Poly pond Bottom clean filtration race way system/Aquaculture Biological Filtration System (ABFS) is interpreted; 2.4 Amonia Removing system from BFT and converting process to microbial protin is interpreted; 2.5 Recirculating Aquaculture System (RAS) is explained; 2.6 Culture of fishes by <u>mechanical and biological system</u> with reusing water is explained; 2.7 In Pond Raceway System (IPRS) is interpreted to culture fishes; 2.8 Culture of fishes in continus flowing water under contolled condition in IRRS is explained.
3. Identify aquaculture technology equipment	3.1 Instructional manual of the technology is carefully read prior to operation; 3.2 <u>Technology equipment</u> is identified and defective equipment are reported in accordance with farm procedure; 3.3 Frist aid procedures is applied during emergency situations.
4. Perform Preventive maintenance	4.1 Schedule of preventive maintenance is interpreted; 4.2 Equipment are cleaned immediately after use in line with standard procedures;

	4.3 Routine check-up and maintenance are performed as per schedule; 4.4 Tools and equipment are stored in designated areas according to farm procedures.
Range of Variables	
Variables	Range (may include but not limited to):
1. Personal Protective Equipment (PPE)	1.1 Hand Gloves 1.2 Safety boots 1.3 Goggles 1.4 Face mask 1.5 Apron 1.6 Feet and hand washing facilities
2. Hazards	2.1 Chemical hazards 2.2 Biological hazards 2.3 Physical hazards 2.4 Mechanical and electrical hazard 2.5 Mental hazard 2.6 Ergonomic hazard
3. Mechanical, biological system	3.1 Echo trap 3.2 Drum filter 3.3 Protien skimmer 3.4 Degasing unit 3.5 Ozen Generator 3.6 UV filter 3.7 K1 media 3.8 K3media 3.9 K5 media 3.10 Oxygen Generator 3.11 Oxygen cone 3.12 CaCO ₃ 3.13 Probiotic 3.14 NaCl 3.15 Molases 3.1 Imhopcon
4. Aquaculture technology equipment	4.1 Centrifugal and sub mersible pump 4.2 Eccentric pump 4.3 Compressor 4.4 Blower (Ring blower and root blower) 4.5 Rotary drum filter 4.6 Mechanical filter 4.7 Biological filter 4.8 Oxygen concentrator 4.9 Air supply difusser/Air stone

	4.10 Oxygen cone 4.11 Paddle wheel airator 4.12 Turbine airator 4.13 Control Pannel board
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	
1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 Prepared for work 1.2 Interpreted aquaculture technology system 1.3 Identified aquaculture technology equipment 1.4 Maintained Preventive maintenance
2. Underpinning knowledge	2.1 OSH 2.2 Work safety procedures 2.3 Different types of hazards 2.4 Necessity of Personal hygiene 2.5 Advantage and disadvantages of aquaphonic and biofloc system 2.6 Safe handling of tools and equipment 2.7 Necessity of preventive maintenance 2.8 Different types and uses of aquaculture technology system 2.9 Functions of aquaculture technology equipment 2.10 Use of Mechanical and biological system
3. UsUnderpinning skills	3.1 Handling tools and equipment 3.2 Interpreting maintenance schedule 3.3 Applying techniques of lubricant and grease 3.4 Identifying aquaculture technology equipment 3.5 Identifying hazard 3.6 Controlling hazard 3.7 Maintaining cleanliness 3.8 Communication skills 3.9 Presentation skill 3.10 Computation skill 3.11 Keeping record
4. Required attitude	4.1 Commitment to occupational health and safety 4.2 Sincere and honest to duties 4.3 Promptness in carrying out activities 4.4 Environmental concerns 4.5 Eagerness to learn farm operation 4.6 Tidiness and timeliness 4.7 Respect of peers and seniors in workplace

	4.8 Communicate with peers and seniors in workplace
5. Resource implications	5.1 Workplace/Farm 5.2 Tools, equipment and facilities appropriate to the process or activity. 5.3 Materials relevant to the proposed activity. 5.4 Outfits appropriate in applying safety measures. 5.5 Equipment for water and fish health test 5.6 Internet facilities 5.7 Record book 5.8 Manuals, catalogs and magazine 5.9 Competency Based Learning Materials (CBLM)
6. Methods of assessment	Assessment methods may include but not limited to: 6.1 Written test 6.2 Demonstration 6.3 Oral questioning 6.4 Portfolio
7. Context of assessment	7.1 Competency assessment must be done in a training center or in an actual or simulated workplace after completion of the training module 7.2 Assessment should be done by a NSDA certified/nominated assessor
Accreditation Requirements Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.	

Occupation Specific Unit of Competencies

Unit Code and Title	OU-AGRI-AC-01-L3-V1: Conduct Pre-Operational Aquaculture Activities
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to a Conduct Pre-Operational Aquaculture Activities. It specifically includes the tasks of selecting site for aquaculture operation, facilitating water source for aquaculture, monitoring suitability of water, preparing pre operational facilities and securing facilities
Nominal Hours	50 Hours
Elements of Competency	Performance Criteria <u>Bold & Underlined</u> terms are elaborated in the Range of Variables
1. Select site	1.1 <u>Types of site</u> and ponds are interpreted for fish culture; 1.2 Scope of easy communication is assessed for easy accessibility of raw materials, tools and equipment; 1.3 Accessibility of market is assessed for easy delivery of aquaculture products; 1.4 Source of availability of cheap labour and <u>utilities</u> are identified; 1.5 Agreement is signed for leasing and rental land; 1.6 Social and <u>environmental conditions</u> are interpreted.
2. Facilitate water source for aquaculture	2.1 Source of water is identified; 2.2 Water quality is tested to identify <u>parameter</u> as per standard procedure; 2.3 Volume of water to be required is determined in accordance to standard procedures; 2.4 <u>Water sources</u> are selected as per requirement; 2.5 <u>Types of species</u> are determined on the basis of water parameter.
3. Monitor suitability of water and soil	3.1 Normal mortality is determined and differentiated from initial disease outbreak; 3.2 Mortalities are counted and documented daily in accordance to organizational standard procedures; 3.3 Mortalities are collected and placed in appropriate freezer for post mortem analysis;
4. Prepare aquaculture infrastructure facilities	4.1 Necessary tools and equipemt are identified and collected as per requirement; 4.2 Pond preparation is conducted in accordance to standard procedures; 4.3 Tanks are cleaned and disinfected following standard procedures; 4.4 Net cages and frames are brushed and repaired as per

	requirement; 4.5 Inlet water is filtered by screening.
5. Secure facilities	5.1 Facilities are checked for fish <u>predators</u> and trespassers; 5.2 Fish predators and trespassers are prevented to enter the aquaculture facilities; 5.3 Preventive structures are installed during extreme weather; 5.4 Basic post-operative checking of tools and equipment is conducted in accordance with manufacturer's manual; 5.5 Tools, and equipment are cleaned and stored according to approved practices.
Range of Variables	
Variables	Range (may include but not limited to):
1. Types of sites	1.1 Own site 1.2 Rental site 1.3 Government land on lease
2. Utilities	2.1 Water source 2.2 Power supply 2.3 Labour 2.4 Transportation 2.5 Storage facilities 2.6 Weather forecasting 2.7 Protective netting
3. Environmental conditions	3.1 Light intensity 3.2 Rain 3.3 Temperature 3.4 Season 3.5 Photoperiodism 3.6 Affect of harmful trees
4. Water parameter	4.1 Water pH value 4.2 Water turbidity 4.3 Total Dissolve Solid (TDS) 4.4 Water temperature 4.5 Alkalinity 4.6 Hardness 4.7 Iron 4.8 Dissolved oxygen 4.9 Ammonia (Nitrate and Nitrite) 4.10 Dissolved chlorine 4.11 Calsium, phosphorus 4.12 Dissolved carbondioxide 4.13 Dissolved hydrogen sulphide

	4.14 Salinity
5. Water source	5.1 Flow-through 5.2 Drain and fill 5.3 Underground 5.4 Rain water
6. Nature of aquaculture	6.1 Monoculture ▪ Tilapia ▪ Indegenous Sing, magur and shol fish ▪ Pabda ▪ Golsha ▪ Thai sarputi ▪ Pangus ▪ Thai koy ▪ Tengra ▪ Shrimp ▪ Prawn 6.2 Polyculture ▪ Ruhi ▪ Katla ▪ Mrigal ▪ Silver carup ▪ Common Carp ▪ Grass carp ▪ Black carp ▪ Bighead carp ▪ Puti
7. Tools	7.1 Spade 7.2 Filter net 7.3 Measuring tape 7.4 Meter scale 7.5 Scissors 7.6 Knife 7.7 Hygrometer 7.8 Thermometer 7.9 p ^H meter 7.10 Basket 7.11 Bucket 7.12 Belcha 7.13 Shovel 7.14 Cutting pliers 7.15 Mattock 7.16 Auger 7.17 Rain gauge

	7.18 Hectare counter 7.19 Graduated cylinder 7.20 Planimeter 7.21 Anemometer
8. Equipments	8.1 Different types of net 8.2 Airtor 8.3 Different type of pump ▪ Submersible water pump ▪ Irrigation water pump ▪ Mud pump 8.4 Hose pipe 8.5 Weighing scale 8.6 Generator 8.7 Control panel 8.8 Auto feeder 8.9 Boat 8.10 Secchi disc
9. Screening	9.1 Use different mesh size net 9.2 Use drum filter 9.3 Weaving net 9.4 Bamboo and net
10. Predators	10.1 Birds 10.2 Frogs 10.3 Man 10.4 Rat 10.5 Snake 10.6 Predator fish
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	
1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 Selected site for aquaculture operation 1.2 Changed water of aquaculture facility 1.3 Monitored and collect mortalities 1.4 Prepared aquaculture facilities 1.5 Secured facilities
2. Underpinning knowledge	2.1 Types of sites 2.2 Use of tools and equipment 2.3 Importance of easy communication 2.4 Utilities 2.5 Types of species 2.6 Preventive structures 2.7 Environmental conditions

	2.8 Soil conditions 2.9 Water parameter 2.10 Water source 2.11 Predators 2.12 Culture facilities
3. Underpinning skills	3.1 Identifying and controlling hazards 3.2 Using different meters to test water parameter 3.3 Handling tools and equipment safely 3.4 Communication skills 3.5 Presentation skills 3.6 Problem solving skills 3.7 Applying process of water exchange procedure 3.8 Applying water purification procedure 3.9 Maintaining facilities 3.10 Computation skills 3.11 Keeping record
4. Required attitude	4.1 Commitment to occupational health and safety 4.2 Sincere and honest to duties 4.3 Promptness in carrying out activities 4.4 Environmental concerns 4.5 Eagerness to learn farm operation 4.6 Tidiness and timeliness 4.7 Respect of peers and seniors in workplace 4.8 Communicate with peers and seniors in workplace.
5. Resource implications	5.1 Workplace/Farm 5.2 Tools, equipment and facilities appropriate to the process or activity 5.3 Materials relevant to the proposed activity 5.4 Outfits appropriate in applying safety measures. 5.5 Internet facilities 5.6 Record book 5.7 Manuals, catalogs and magazine 5.8 Competency Based Learning Materials (CBLM)
6. Methods of assessment	Assessment methods may include but not limited to: 6.1 Written test 6.2 Demonstration 6.3 Oral questioning 6.4 Portfolio
7. Context of assessment	7.1 Competency assessment must be done in a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by a NSDA certified/nominated assessor.

Accreditation Requirements

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Unit Code and Title	OU-AGRI-AC-02-L3-V1: Prepare and Maintain Aquaculture Facilities
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to Prepare and maintain aquaculture facilities It specifically includes the tasks of evaluating site, drawing the lay-out plan, carrying-out installation of facilities and maintaining facilities
Nominal Hours	50 Hours
Elements of Competency	Performance Criteria <u>Bold & Underlined</u> terms are elaborated in the Range of Variables
1. Evaluate site	1.1 Species <u>Site</u> is identified on the basis of aquaculture requirement; 1.2 Land area and project budget is determined to suite the size, shape and materials to be used; 1.3 Soil and water parameter are determined as per standard procedure; 1.4 <u>Water source</u> is identified to determine volume flow rate; 1.5 <u>Topography</u> is measured using a transit to establish the zero datum, level for water supply and drainage system; 1.6 Water is analyzed for determining parameter using different testing kits and meters; 1.7 Natural food is determined by plankton sampling and microscopic examination to establish the feeding requirement; 1.8 Tide level of the area is read to establish type of material and depth of facilities;
2. Draw and design the lay-out plan	2.1 Size and shapes of site are determined on the basis of seasons, water availibiliy and species to be cultured; 2.2 The number and size of compartments is determined based on the available area of the land; 2.3 Dikes crown and base is confirmed based on the tide level, typhoon and flooding history of the area; 2.4 Markers/strings are placed as guide to the layout; 2.5 Materials for frame and type to be used are determined based on the site selection; 2.6 Mesh size of net is determined based on available fingerling size in the area and species of fish; 2.7 Number of <u>water pumps</u> and well/water resource to be used and its location is determined; 2.8 Other culture facilities are planned and laid- out .
3. Carry-out construction and installation of facilities	3.1 Construction resources (materials and manpower) are identified and collected; 3.2 Site is prepared as per dimensions mentioned in planning and layout; 3.3 Major and other support farm facilities are installed;

	3.4 Necessary <u>gears, Equipment and machineries</u> are positioned according to work requirement; 3.5 <u>Life support system</u> is appropriately installed 3.6 Posts are positioned according to work site requirements; 3.7 Mooring system is checked and installed according to the standard procedure.
4. Maintain facilities	4.1 Netting materials are made up and attached to floats and sinkers; 4.2 Net is inspected for damage; 4.3 Net are set-up to fit the frame; 4.4 Bottom of net is checked if it is in proper place; 4.5 Preventive maintenance is conducted according to maintenance schedule; 4.6 Damaged or faulty facilities are repaired or replaced as per requirement; 4.7 Necessary gears, equipment and machinery are stored in prescribed location; 4.8 Necessary maintenance record are kept and reported to the proper personnel;
Range of Variables	
Variables	Range (may include but not limited to):
1. Site	1.1 Pond 1.2 Tank 1.3 Cage
2. Water sources	2.1 Shallow well 2.2 Irrigation 2.3 Natural waters ▪ Lake ▪ Lagoon ▪ Impoundments ▪ River ▪ Rain
3. Topography	3.2. Flat 3.3. Sloping 3.4. uneven
4. Size and shapes	4.1 Length 4.2 Height 4.3 Depth 4.4 Width 4.5 Round 4.6 Square 4.7 Rectangular 4.8 Eliptrical
5. Water pums	5.1 Centrifugal pumps

	5.2 Submersible pumps 5.3 Air pumps 5.4 Water circulating pumps 5.5 Diaphragm pumps 5.6 Positive displacement pumps
6. Materials	6.1 Tanks ▪ Earthen ▪ Cement ▪ Fiberglass ▪ Canvass ▪ Plastic 6.2 Cages Frames ▪ Bamboo ▪ G.I. Pipe ▪ PVC Pipes 6.3 Net Mesh ▪ Size 22 ▪ Size 20 ▪ Size 17 ▪ Size 14 6.4 Pond ▪ Cemented Dike ▪ Geomembrane liner ▪ Earthen
7. Gears, equipment and machinery	7.1 Different types of net 7.2 Airetor 7.3 Different types of pumps 7.4 Hose pipe 7.5 Weighing scale 7.6 Generator 7.7 Control panel 7.8 Auto feeder 7.9 Boat 7.10 Sechi disc 7.11 Mechanical Filter 7.12 Compressor 7.13 Diffuser 7.14 Aeration Bags or Tanks 7.15 Water Quality Sensors 7.16 Disinfection Equipment
8. Life support system	8.1 Aeration line 8.2 Water Line 8.3 Drainage Line

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency

1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 Evaluated site 1.2 Drawn the lay-out plan 1.3 Carried-out installation of facilities 1.4 Maintained facilities
2. Underpinning knowledge	2.1 Nets 2.2 Frames 2.3 Drainage system 2.4 Necessity of fencing 2.5 Types of site 2.6 Water sources 2.7 Topography 2.8 Materials and manpower 2.9 Life support system 2.10 Dikes crown and base 2.11 Markers/strings 2.12 Mesh size 2.13 Types of water pumps and their uses 2.14 Use of floats and sinkers 2.15 preventive maintenance
3. Underpinning skills	3.1 Handling tools and equipment 3.2 Communication skills 3.3 Presentation skills 3.4 Problem solving skills 3.5 Computation skills 3.6 Applying techniques to identify water sources 3.7 Using materials and manpower 3.8 Following the process of installation of facilities 3.9 Applying the techniques of maintaining facilities
4. Required attitude	4.1 Commitment to occupational health and safety 4.2 Sincere and honest to duties 4.3 Promptness in carrying out activities 4.4 Environmental concerns 4.5 Eagerness to learn farm operation 4.6 Tidiness and timeliness 4.7 Respect of peers and seniors in workplace 4.8 Communicate with peers and seniors in workplace
5. Resource implications	5.1 Workplace/Farm 5.2 Tools, equipment and facilities appropriate to the process or activity. 5.3 Materials relevant to the proposed activity.

	5.4 Outfits appropriate in applying safety measures 5.5 Internet facilities 5.6 Record book 5.7 Manuals, catalogs and magazine 5.8 Competency Based Learning Materials (CBLM)
6. Methods of assessment	Assessment methods may include but not limited to: 6.1 Written test 6.2 Demonstration 6.3 Oral questioning 6.4 Portfolio
7. Context of assessment	7.1 Competency assessment must be done in a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by a NSDA certified/nominated assessor.
Accreditation Requirements Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.	

Unit Code and Title	OU-AGRI- AC-03-L3-V1: Culture Fish in Cage
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to culture fish in cage. It specifically includes the tasks of preparing for cage culture; setting up cage, collecting and stocking fingerlings, feeding fish, controlling disease and harvesting fish
Nominal Hours	30 Hours
Elements of Competency	Performance Criteria <u>Bold & Underlined</u> terms are elaborated in the Range of Variables
1. Prepare for cage culture	1.1 PPE is collected and worn as per work requirement; 1.2 Necessary <u>tools, equipment and materials</u> are identified and collected as per work requirement; 1.3 Site is assessed to culture fish based on several <u>factors</u>; 1.4 Site is selected and assured on the basis of site assessment; 1.5 Nature of fishes are selected for culture.
2. Set up cage	2.1 Identify and collect cages as per volume of <u>species</u>; 2.2 Necessary <u>attachments</u> are identified and collected; 2.3 Setup cage with attachment as per standard procedure.
3. Collect and Stock fingerlings	3.1 Species are selected for culture as per site requirement; 3.2 <u>Finger lings' quality</u> is selected as per requirement; 3.3 Finger lings are transported to the site on the basis of maintaining <u>physical conditions</u>; 3.4 Physical conditions are tested and necessary measures are taken before release into the pond; 3.5 Fish fingerlings or juveniles are introduced into the pond; 3.6 Stocking density is monitored to prevent overcrowding, which can lead to poor growth and health issues.
4. Execute feed management	4.1 Feeding schedule is determined as per <u>requirement</u>; 4.2 Feed is collected as per type of Species ; 4.3 Feed is stored in the designated place in according to manufacturer instruction; 4.4 Feed is provided on the basis of schedule and weather ; 4.5 Observation of feeding waste is carried out ; 4.6 Sampling weight is carried out to observe growth rate as per feeding.
5. Control disease	5.1 Identify <u>disease</u> on the basis of external and internal symptoms; 5.2 Regular health checking is carried out; 5.3 Water quality is tested if needed; 5.4 Balance food is provided to reduce disease;

	5.5 <u>Anti pathogenic</u> measure is taken in case of external and internal injury as per requirement and standard procedure ; 5.6 Severe Affected fishes are isolated from the cage.
6. Harvest fish	6.1 <u>Harvesting indices</u> of different fishes are properly determined based on aquaculture manual; 6.2 Different <u>harvesting methods</u> are identified; 6.3 Appropriate <u>harvesting tools</u> is used to collect fish; 6.4 <u>Processing</u> of fish is done for marketing and consuming; 6.5 Tools are kept in store as per workplace procedure; 6.6 Record keeping of harvesting is done for marketing; 6.7 Cost effect analysis is done to identify profit or loss of project.
Range of Variables	
Variables	Range (may include but not limited to):
1. Tools, equipment and materials	1.1 Tools ▪ Hand saw ▪ Hammer ▪ Cutter ▪ Measuring tape ▪ Net cleaning nozzle 1.2 Equipment ▪ Nets and Seines ▪ Sorting and Grading Bins ▪ Cage ▪ Scoop net ▪ Weighing machine ▪ Signal light ▪ Plastic Drum 1.3 Materials ▪ Bamboo ▪ Rope ▪ Angle ▪ GI pipe
2. Factors	2.1 Climatic requirement 2.2 Water source 2.3 Accessibility 2.4 Water flow 2.5 Facilities/amenities 2.6 Socio-economic condition 2.7 Water quality

	▪ DO ▪ p^H level ▪ Hardness ▪ Ammonia level
	2.8 Aquatic vegetation
3. Species	3.1 Saline water species ▪ Mullet ▪ Shrimps ▪ Sea bass (Coral) ▪ Telapia 3.2 Fresh water species ▪ Telapia ▪ Pangas ▪ Thai sharputi ▪ Common carp ▪ Minor carps
4. Attachmement	4.1 Post 4.2 Anchor 4.3 Float 4.4 Red flag 4.5 Restriction indicator
5. Finger lings' quality	5.1 Following proper inbreeding system 5.2 Age and weight of parents 5.3 Age of fingerlings 5.4 Size and shape of fingerlings 5.5 Physical appearence
6. Physical conditions	6.1 Water temperature maintain for quality of fingerlings 6.2 Proper oxygen level 6.3 Proper amonia level 6.4 p ^H value 6.5 Proper density 6.6 Counting 6.7 Timing of transportation 6.8 Types of carrying media ▪ Oxynetted Polybag ▪ Drum
7. Requirement	7.1 Growing stages 7.2 Nutritional value 7.3 Body weight 7.4 Quantity 7.5 Quality 7.6 Size
8. Disease	8.1 Epizotig Ulcratic Syndrome (EUS)

	8.2 Fins and gills rott 8.3 Dropsy 8.4 Argulosis 8.5 Anchor disease
9. Anti pathogenic	9.1 Benzal Konium Choloride (BKC) 9.2 Potasium per manganet (KMnO ₄) 9.3 Salt 9.4 Formaldehyde 9.5 Coper Sulphate (CuSO ₄) 9.6 Potas alam (Phitkhery)
10. Harvesting Indices	10.1 Desirable marketable size of the fish attained 10.2 Physical appearance 10.3 Age 10.4 Weight
11. Harvesting methods	11.1 Manual 11.2 Mechanized
12. Harvesting Tools and equipment	12.1 Scoop net 12.2 Push net 12.3 Baskets or plastic crates 12.4 Platic drums 12.5 Hand gloves
13. Processing	13.1 Cleaning 13.2 Sorting 13.3 Carrying 13.4 Grading 13.5 Icing 13.6 Packaging
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	
1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 Prepared for cage culture 1.2 Set up cage 1.3 Collected and stocked fingerlings 1.4 Fed fish 1.5 Controled disease 1.6 Harvested fish
2. Underpinning knowledge	2.1 OSH 2.2 Hazards and types of hazards 2.3 Control hazard 2.4 Safe use of necessary tools, equipment and materials 2.5 Factors of site selection 2.6 Different species

	2.7 Necessary attachment for setting cage 2.8 Fingerlings and their quality 2.9 Requirement for feeding schedule 2.10 feed and feed nutrition 2.11 FCR calculation 2.12 Affect of weather for feeding 2.13 Procedure of feeding of different species 2.14 Different disease of species 2.15 Effect of water quality on fish culture 2.16 Procedure to control disease 2.17 Effect of antipathogenic measure 2.18 Procedure of using antipathogenic 2.19 Procedure to increase test of species 2.20 Harvesting indices 2.21 Harvesting methods 2.22 Post harvest handling 2.23 Harvesting tools and equipment 2.24 Fish processing 2.25 Necessity of cost analysis
3. Underpinning skills	3.1 Handling tools and equipment 3.2 Communication skills 3.3 Problem solving skills 3.4 Computation skills 3.5 Applying the techniques of selecting and collecting fingerlings 3.6 Applying the process of feeding fish 3.7 Controlling disease of species 3.8 Controlling quality of water 3.9 Applying the checking process of growth rate of fish 3.10 Processing fish after harvesting
4. Required attitude	4.1 Commitment to occupational health and safety 4.2 Sincere and honest to duties 4.3 Promptness in carrying out activities 4.4 Environmental concerns 4.5 Eagerness to learn farm operation 4.6 Tidiness and timeliness 4.7 Respect of peers and seniors in workplace 4.8 Communicate with peers and seniors in workplace
5. Resource implications	5.1 Workplace/Farm 5.2 Materials relevant to the proposed activity. 5.3 Outfits appropriate in applying safety measures 5.4 Quality water 5.5 Fish harvesting gears and nets

	5.6 Equipment for water and fish health test 5.7 Internet facilities 5.8 Record book 5.9 Manuals, catalogs and magazine 5.10 Competency Based Learning Materials (CBLM)
6. Methods of assessment	Assessment methods may include but limited to: 6.1 Written Test 6.2 Demonstration 6.3 Oral questioning 6.4 Portfolio
7. Context of assessment	7.1 Competency assessment must be done in a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by a NSDA certified/nominated assessor.
Accreditation Requirements Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.	

Unit Code and Title	OU-AGRI- AC-04-L3-V1: Culture Fish in Ponds
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to culture fish in ponds. It specifically includes the tasks of evaluating site, preparing pond for culture, collecting and stocking fingerlings, executing feed management, control disease and harvesting fish
Nominal Hours	50 Hours
Elements of Competency	Performance Criteria <u>Bold & Underlined</u> terms are elaborated in the Range of Variables
1. Evaluate site	1.1 Species site is identified on the basis of <u>factors</u> of aquaculture requirement; 1.2 Land area size and project budget is determined to suite the size, shape and materials to be used; 1.3 Topography is measured using a transit to establish the zero datum, level for water supply and drainage system; 1.4 Reliable and clean water source is ensured to sound growth of species; 1.5 Controlling factors of leakage of water is identified and necessary measures are taken; 1.6 Dike condition is checked for the safety and stability of the dike structure; 1.7 Defect of water inlet and outlet is checked to take preventive measure and to ensure required water parameter in accordance with the standard procedure.
2. Prepare pond for culture	2.1 Methods of pond construction are interpreted; 2.2 Water of pond is dried and treated as per requirement; 2.3 Dike is repaired for the safety and stability of the dike structure; 2.4 Unexpected weed and plants are removed as per requirement; 2.5 Preditory fishes are removed to protect species; 2.6 Liming and fertilization is provided for initial feeding of fry and fingerlings; 2.7 Natural food is determined by plankton sampling and microscopic examination to establish the feeding requirement; 2.8 Soil and water is analyzed for determining parameter using different testing kits and meters.
3. Collect and Stock fingerlings	3.1 Species are selected for culture as per site requirement; 3.2 <u>Finger lings' quality</u> is selected as per requirement; 3.3 Finger lings are transported to the site on the basis of maintaining <u>physical conditions</u>;

	3.4 Physical conditions are tested and necessary measures are taken before release into the pond; 3.5 Water temperature of poly bags is adjusted by keeping in a tank along with fingerlings ; 3.6 Fish fingerlings or juveniles are introduced s into the pond; 3.7 Stocking density is monitored to prevent overcrowding, which can lead to poor growth and health issues; 3.8 Liming and fertilization is ensured during cultural period for <u>plankton growth</u>.
4. Execute management feed	4.1 Observation is carried out to check the physical conditions and mortality of fingerlings afte 6 to 12 hours; 4.2 Feed Conversion Ration (FCR) is analyzed on the basis of volume of fish; 4.3 Feeding schedule is determined as per requirement 4.4 <u>Feed</u> is collected as per <u>type of Species</u> ; 4.5 Feed is stored in the designated place in according to manufacturer instruction; 4.6 Feed is provided to the species on the basis of schedule, weather and standard procedure; 4.7 Observation of feeding waste is carried out ; 4.8 Sampling weight is carried out to observe grwth rate as per feeding.
5. Control disease	5.1 <u>Diseases</u> are identified on the basis of external and internal symptom; 5.2 Regular health chedking is carried out; 5.3 Water qulity is tested if needed; 5.4 Balance food is provided to reduce disease; 5.5 <u>Anti pathogenic</u> measure is taken in case of external and internal injury as per requirement and standard procedure ; 5.6 Severe Affected fishes are isolated from the pond.
6. Harvest fish	6.1 <u>Harvesting indices</u> of different fishes are properly determined based on aquaculture manual; 6.2 Different <u>harvesting methods</u> are identified; 6.3 Partial harvest and restockings are done on the basis of growth rate; 6.4 Appropriate <u>harvesting tools and equipment</u> is used to collect fish; 6.5 <u>Processing</u> of fish is done for marketing and consuming; 6.6 Tools are kept in store as per workplace procedure; 6.7 Record keeping of harvesting is done for marketing;

	6.8 Cost effect analysis is done to identify profit or loss of project.
Range of Variables	
Variables	Range (may include but not limited to):
1. Tools, equipment and materials	1.1 Tools ▪ Cutter ▪ Spade ▪ Water screens ▪ Different types of harvesting nets ▪ Sampling nets ▪ Plastic drums ▪ Measuring tape ▪ Water depth measuring tools ▪ Logbooks or digital tools for recording data on feeding, water quality, and other relevant parameters ▪ Rakes and shovels for routine pond maintenance ▪ Thermometers ▪ pH meters (pH papers) ▪ Water testing kits ▪ Secchi disk ▪ Feed monitoring tray 1.1 Equipment ▪ Cast net and sienes ▪ Sorting and grading bins ▪ Cage ▪ Scoop net ▪ Weighing machine ▪ Plastic drum ▪ Submersible water pumb ▪ Irrigation water pump ▪ Hose pipe ▪ Small boat ▪ Secchi disc ▪ Mechanical filter ▪ Aerators ▪ Water circulatory pumps ▪ Aeration bags or tanks ▪ Water quality sensors ▪ Disinfection equipment ▪ Secchi disk for water clarity measurement ▪ Feeders

	1.1 Materials ▪ Spade ▪ Baskets ▪ Screening nets ▪ Fish grading tray ▪ Soil for pond embankment construction ▪ Liners or clay for pond lining (to prevent water seepage) ▪ Fish feed ▪ Testing kits for pH, dissolved oxygen, ammonia, nitrite, and nitrate levels ▪ First aid kit
2. Factors	2.1 Climatic requirement 2.2 Topography 2.3 Accessibility 2.4 Water supply 2.5 Water quality 2.6 Drainage 2.7 Facilities/amenities 2.8 Socio-economic condition 2.9 Soil ▪ Type ▪ Depth ▪ P^H level
3. Finger lings' quality	3.1 Following proper inbreeding protection system 3.2 Age and weight of parents 3.3 Age of fingerlings 3.4 Size and shape of fingerlings 3.5 Physical appearance
4. Physical conditions	4.1 Water temperature maintain for quality of fingerlings 4.2 Proper oxygen level 4.3 Proper ammonia level 4.4 Ph value 4.5 Proper stocking density 4.6 Curing and acclimatization before stocking 4.7 Counting 4.8 Timing of transportation 4.9 Types of carrying media ▪ Oxynetted Polybag ▪ Drum
5. Plankton growth	5.1 Types of plankton ▪ Phyto plankton

	▪ Zoo plankton 5.2 Banthos and periphytons ▪ Insect and insect larvae ▪ Annalidis ▪ Gstrapods ▪ Moss 5.3 Plankton measurement ▪ By Hand ▪ Glass system ▪ Secchi disc system 5.4 Banthos measurement ▪ Bottom soil screening ▪ Megnifying glass system
6. Requirement	6.1 Growing stages 6.2 Nutritional value 6.3 Body weight 6.4 Quantity of fish 6.5 Quality of fish 6.6 Size of fishes
7. Feed	7.1 Natural feed 7.2 Supplimentary feed ▪ Plant based feed ▪ Animal based feed 7.3 Formulated feed ▪ Floating feed ▪ Sinking feed ▪ Crumble feed ▪ Granular 7.4 Live feed
8. Type of Species	8.1 Saline water species ▪ Coral ▪ Shrimps ▪ Mugil ▪ Bata 8.2 Fresh water species ➤ Indian major carp ▪ Ruhi ▪ Catla ▪ Mrigel ▪ Caliboush ➤ Exotic fish ▪ Silver carp

	▪ Bighead carp ▪ Grass carp ▪ Black carp ▪ Telapia ▪ Pangas ▪ Thai sarputi ▪ Common carp ▪ Thai koy ▪ Vietnumi koy/shoel ➤ Indeginous/ Cat fish ▪ Sings ▪ Magur ▪ Pabda ▪ Gholsha ▪ Tengra ▪ Mola fish ▪ Deshi Sharputi ▪ Boal ▪ Chitol ▪ Prawn ▪ Foli
9. Disease	9.1 Epizotig ulcratic syndrome (eus) 9.2 Fins and gills rot 9.3 Dropsy 9.4 Argulosis 9.5 Anchor disease 9.6 Antena and rostrum broken 9.7 External fouling 9.8 Sapronegnia 9.9 Soft shell 9.10 Monodon baculo virus (mbv) 9.11 White spot syndrome virus (wssv) 9.12 Early mortality syndrome vius (ems) 9.13 Tail rotten
10. Anti paracite pathogenic measure	10.1 Benzal onium Choloride (BKC) 10.2 Potasium per manganet (kmno) 10.3 Salt 10.4 Formaldehyde 10.5 Coper Sulphate (cuso ₄) 10.6 Potas alam (Phitkhery)
11. Harvesting Indices	11.1 Desirable size of the fish attained 11.2 Physical appearance

	11.3 Age 11.4 Weight
12. Harvesting methods	12.1 Manual 12.2 Mechanized
13. Harvesting Tools	13.1 Different types of nets (cast net, sein net etc.) 13.2 Baskets or plastic crates 13.3 Hand gloves 13.4 Plastic Drum 13.5 Fish grading trays 13.6 Different types of trap 13.7 Angling
14. Processing	14.1 Cleaning 14.2 Sorting 14.3 Carrying 14.4 Grading 14.5 Icing 14.6 Packaging
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	
1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 Evaluated site 1.2 Prepared pond for culture 1.3 Collected and Stocked fingerlings 1.4 Provided Feed to fish 1.5 Controlled disease 1.6 Harvested fish
2. Underpinning knowledge	2.1 OSH 2.2 Hazards and types of hazards 2.3 Control hazard 2.4 Safe use of necessary tools, equipment and materials 2.5 Factors of site selection 2.6 Topography 2.7 Pond purification system 2.8 Predatory fishes 2.9 Natural food 2.10 Different types of species 2.11 Finger lings' quality 2.12 Physical conditions of fingerlings transportation 2.13 Fingerlings and their quality 2.14 Plankton growth 2.15 Benthic flora and fauna assessment 2.16 Feed Conversion Ratio (FCR)

	2.17 Requirement for feeding schedule 2.18 Nutritional value of feed 2.19 Feeding system of different species 2.20 Affect of weather on feeding 2.21 Different types disease of fishes 2.22 Effect of water quality on fish culture 2.23 Process to improve platability fis as food 2.24 Procedure of disease control 2.25 Effect of antipathogenic measure 2.26 Procedure of using antipathogenic 2.27 Maturity indices 2.28 Harvesting methodes 2.29 Harvesting tools 2.30 Fish processing 2.31 Necessity of cost analysis
3. Underpinning skills	3.1 Handling tools and equipment 3.2 Communication skills 3.3 Problem solving skills 3.4 Computation skills 3.5 Using different measureing tools 3.6 Applying the techniques of preparing ponds 3.7 Applying the techniques of selecting and collecting fingerlings 3.8 Applying the process of feeding fish 3.9 Applying the techniques of controlling dieasease 3.10 Applying the process of controlling the quality of water 3.11 Checking growth rate of fish 3.12 Processing fish after harvesting
4. Required attitude	4.1 Commitment to occupational health and safety 4.2 Sincere and honest to duties 4.3 Promptness in carrying out activities 4.4 Environmental concerns 4.5 Eagerness to learn fish farm operation 4.6 Tidiness and timeliness 4.7 Respect of peers and seniors in workplace 4.8 Communicate with peers and seniors in workplace
5. Resource implications	5.1 Workplace/Farm 5.2 Materials relevant to the proposed activity. 5.3 Outfits appropriate in applying safety measures 5.4 Quality water 5.5 Fish harvesting gears and nets 5.6 Equipment for water and fish health test

	5.7 Internet facilities 5.8 Record book 5.9 Manuals, catalogs and magazine 5.10 Competency Based Learning Materials (CBLM)
6. Methods of assessment	Assessment methods may include but limited to: 6.1 Written Test 6.2 Demonstration 6.3 Oral questioning 6.4 Portfolio
7. Context of assessment	7.1 Competency assessment must be done in a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by a NSDA certified/nominated assessor.
Accreditation Requirements Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.	

Unit Code and Title	OU-AGRI- AC-05-L3-V1: Culture Fish in Tanks
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to culture fish in tanks. It specifically includes the tasks of evaluating site, preparing tank for culture, collecting and ing fingerlings, executing feed management, maintaining water quality, controlling disease and harvesting fish
Nominal Hours	40 Hours
Elements of Competency	Performance Criteria <u>Bold & Underlined</u> terms are elaborated in the Range of Variables
1. Evaluate site	1.1 Species Site is identified on the basis of <u>factors</u> of aquaculture requirement; 1.2 Land area size and project budget is determined to suite the size, shape and materials to be used; 1.3 Reliable and clean water source is ensured.
2. Prepare tank for culture	2.1 <u>tank culture type</u> is selected; 2.2 Design or sketches of tank is done as per planning ; 2.3 Tank is prepared by hiring the necessary source according to design or sketches; 2.4 Water of tank is dried and purified as per requirement; 2.5 Liming is provided for maintaining water quality; 2.6 Source of water is analyzed to determin parameter using differen testing kits and meters .
3. Collect and Stock fingerlings	3.1 Species are selected for culture as per site requirement; 3.2 Finger lings’ quality is selected as per requirement; 3.3 Finger lings are transported to the site on the basis of maintaining <u>physical conditions</u> ; 3.4 Physical conditions are tested and necessary measures are taken before release into the tank; 3.5 Water temperature of poly bags is adjusted by keeping in the tank along with fingerlings ; 3.6 Fish fingerlings or juveniles are introduced into the tank after sanitizing with salt or potassium; 3.7 Stocking density is monitored to prevent overcrowding, which can lead to poor growth and health issues.
4. Execute feed management	4.1 Observation is carried out to check the physical conditions and mortality of fingerlings afte 6 to 12 hours; 4.2 Feed Conversion Ration (FCR) is analyzed on the basis of volume of fish; 4.3 Feeding schedule is determined as per requirement ; 4.4 <u>Feed</u> is collected as per <u>type of species</u> ;

	4.5 Feed is provided on the basis of schedule, weather and standard procedure; 4.6 Observation of feeding waste is carried out; 4.7 Sampling weight is carried out to observe growth rate as per feeding.
5. Maintain waterparameter	4.1 Liming is ensured during cultural period to control water quality; 4.2 TDS is increased by adding salt as per species and instruction manual; 4.3 Range of Amonia is controlled by probiotic, biological filter and bottom cleaning as per instruction manual; 4.4 Oxygen level is maintained as per species and instruction manual; 4.5 Water is treated by using <u>mechanical process</u> as per instructional manual.
6. Control disease	5.1 Identify <u>disease</u> on the basis of external and internal symptoms; 5.2 Regular health checking is carried out; 5.3 Water quility is tested with testing kits and different meter; 5.4 Balance food is provided to reduce disease; 5.5 <u>Anti pathogenic</u> measure is taken in case of external and internal injury as per guide line and standard procedure ; 5.6 Severe affected fishes are isolated from the tank as per standard procedure.
7. Harvest fish	6.1 <u>Harvesting indices</u> of different fishes are properly determined based on aquaculture manual; 6.2 Different <u>harvesting methods</u> are identified applied; 6.3 Appropriate <u>harvesting tools and equipment</u> are used to collect fish; 6.4 <u>Processing</u> of fish is done for marketing and consuming; 6.5 Tools are kept in store as per workplace procedure; 6.6 Keeping record of harvesting is done for marketing; 6.7 Cost effect analysis is done to identify profit or loss of project.
Range of Variables	
Variables	Range (may include but not limited to):
1. Tools, equipment and materials	1.1 Tools ▪ Cutter ▪ Measuring tape ▪ Ph meters

	▪ Ammonia test kits, nitrate and nitrite test kits ▪ Dissolved oxygen meters ▪ Small nets and scoops ▪ Tools for sorting and grading 1.2 Equipment ▪ Net ▪ Basket ▪ Scoop net ▪ Weighing machine ▪ Automatic feeders, hand feeders, or feeding trays. ▪ Different types of pumps ▪ Mechanical and biological filters ▪ Generator ▪ Aerators ▪ Air stones ▪ Diffusers ▪ Siphons or vacuum systems ▪ Sensors or devices to monitor and control temperature and humidity in indoor facilities. ▪ Heaters or chillers to regulate water temperature 1.3 Materials ▪ PVC pipes of different dia. ▪ Nets ▪ Aeration pipes ▪ Air stones ▪ Fish feed ▪ Testing kits for ph, dissolved oxygen, ammonia, nitrite, and nitrate levels ▪ First aid kit ▪ Foot baths, hand sanitizers
2. Factors	2.1 Climatic requirement 2.2 Tank slopes 2.3 Location ▪ Indoor ▪ Outdoor ▪ Industrial 2.4 Accessibility 2.5 Water supply 2.6 Power supply 2.7 Drainage 2.8 Facilities/amenities

	2.9 Socio-economic condition 2.10 Tank types ▪ Circular ▪ Oval ▪ Rectangular ▪ Square
3. Tank culture type	3.1 Tank bottom clean system 3.2 Recirculating Aquaculture System (RAS) 3.3 Aquaphonic system 3.4 Biofloc system
4. Planning	4.1 Space 4.2 Volume of production 4.3 Volum of water requirement 4.4 Types of species
5. Finger lings' quality	5.1 Following proper inbreeding system 5.2 Strong and disease free 5.3 Age and weight of parents 5.4 Age of fingerlings 5.5 Size and shape of fingerlings 5.6 Physical appearence
6. Physical conditions	6.1 Water temperature maintaining 6.2 Water depth and quality maintaining 6.3 Proper oxygen level 6.4 Proper amonia level 6.5 Ph value 6.6 Proper density 6.7 Counting 6.8 Timing of transportation 6.9 Types of carrying media ▪ Polybag ▪ Drum
7. Requirement	7.1 Growing stages 7.2 Nutritional value 7.3 Body weight 7.4 Quantity of fishes 7.5 Quality fishes 7.6 Size of fishes
8. Feed	8.1 Supplimentary feed 8.2 Formulated feed ▪ Floating feed ▪ Sinking feed
9. Type of species	9.1 Saline water species ▪ Mulletts

	▪ Coral ▪ Shrimps 9.2 Fresh water species ➤ Exotic fish ▪ Telapia ▪ Pangas ▪ Thai koy ▪ Vietnumi koy/shoel ➤ Indeginous/ cat fish ▪ Foly fish ▪ Sings ▪ Magur ▪ Pabda ▪ Ghulsha ▪ Tengra ▪ Deshi sharputi ▪ Prawn ▪ Chitol ▪ Deshi koy
10. Mechanical process	10.1 Using mechanical filter 10.2 Using compressor or air-blower 10.3 Using air diffuser
11. Disease	11.1 Epizotig Ulcratic Syndrome (EUS) 11.2 Fins and gills rot 11.3 Dropsy 11.4 Argulosis 11.5 Anchor disease 11.6 External fouling 11.7 Sapronegnia
12. Anti pathogenic	12.1 Benzal onium Chloride (BKC) 12.2 Potasium per manganet (KMnO₄) 12.3 Salt 12.4 Formaldehyde 12.5 Coper Sulphate (CuSO₄) 12.6 Potas alam (Phitkhery)
13. Hrvesting Indices	13.1 Desirable size of the fish attained 13.2 Physical appearance 13.3 Age 13.4 Weight
14. Harvesting methods	14.1 Manual 14.2 Mechanized
15. Harvesting Tools and equipment	15.1 Different types of nets 15.2 Baskets or plastic crates

	15.3 Hand gloves 15.4 Drum
16. Processing	16.1 Cleaning 16.2 Sorting 16.3 Carrying 16.4 Grading 16.5 Icing 16.6 Packaging
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	
. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 Evaluated site 1.2 Prepared tank for culture 1.3 Collected and Stock fingerlings 1.4 Provided feed to fish 1.5 Maintained water quality 1.6 Controlled disease 1.7 Harvested fish
2. Underpinning knowledge	2.1 OSH 2.2 Hazards and types of hazards 2.3 Control hazard 2.4 Safe use of necessary tools, equipment and materials 2.5 Factors of site selection 2.6 Water quality 2.7 Finger lings' quality 2.8 Physical conditions of fingerlings transportation 2.9 Action of lime for water quality 2.10 Different species 2.11 Fingerlings and their quality 2.12 Requirement for feeding schedule 2.13 Nutrition value of feed 2.14 Methods of feeding of different species 2.15 Affect of weather for feeding 2.16 Mechanical process of increasing water quality 2.17 Different disease of species 2.18 Effect of water quality on fish culture 2.19 Procedure to control disease 2.20 Effect of antipathogenic measure 2.21 Procedure of using antipathogenic 2.22 Methods of reducing the bad smell of cultured fish 2.23 Maturity indices 2.24 Harvesting methods

	2.25 Harvesting tools 2.26 Fish processing 2.27 Necessity of cost analysis
3. Underpinning skills	3.1 Handling tools and equipment 3.2 Communication skills 3.3 Problem solving skills 3.4 Computation skills 3.5 Using different measuring tools 3.6 Applying the techniques of selecting and collecting fingerlings 3.7 Applying the process of feeding fish 3.8 Applying the techniques of controlling disease 3.9 Applying the process of quality control of water 3.10 Checking growth rate of fish 3.11 Processing fish after harvesting
4. Required attitude	1.1 Commitment to occupational health and safety 4.1 Sincere and honest to duties 4.2 Promptness in carrying out activities 4.3 Environmental concerns 4.4 Eagerness to learn fish farm operation 4.5 Tidiness and timeliness 4.6 Respect of peers and seniors in workplace 4.7 Communicate with peers and seniors in workplace
5. Resource implications	5.1 Workplace/Farm 5.2 Materials relevant to the proposed activity. 5.3 Outfits appropriate in applying safety measures 5.4 Quality water 5.5 Fish harvesting gears and nets 5.6 Equipment for water and fish health test 5.7 Internet facilities 5.8 Record book 5.9 Manuals, catalogs and magazine 5.10 Competency Based Learning Materials (CBLM)
6. Methods of assessment	Assessment methods may include but limited to: 6.1 Written Test 6.2 Demonstration 6.3 Oral questioning 6.4 Portfolio
7. Context of assessment	7.1 Competency assessment must be done in a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by a NSDA certified/nominated assessor.

Accreditation Requirements

Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

Unit Code and Title	OU-AGRI- AC-03-L3-V1: Culture Fish in Poly Ponds
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to culture fish in poly ponds. It specifically includes the tasks of selecting site, preparing poly pond for culture, collecting and stocking fingerlings, executing feed management, controlling disease and harvesting fish
Nominal Hours	40 Hours
Elements of Competency	Performance Criteria <u>Bold & Underlined</u> terms are elaborated in the Range of Variables
1. Select site	1.1 Species site is selected on the basis of <u>factors</u> of aquaculture requirement; 1.2 Land area size and project budget is determined to suite the size, shape and materials to be used; 1.3 Topography is measured using a transit to establish the zero datum, level for water supply and drainage system; 1.4 Source of qualitative water is ensured; 1.5 Necessary tools, equipment and materials are identified and collected as per requirement of poly pond culture.
1. Prepare poly pond for culture	2.1 Water of pond is dried and repaired as per requirement of poly pond; 2.2 Unexpected weed and plants are removed as per requirement; 2.3 Bottom pit is prepared in centre of pond as per <u>standard measurement</u> to collect sludge/black soil; 2.4 Preserver of sludge/black soil removal and water treatment are kept outside the pond; 2.5 HDPE liner is laid inside the pond surface as per standard procedure; 2.6 Equipment are installed in accordance with the requirement; 2.7 Water is analyzed for determining parameter using differen testing kits and meters; 2.8 Water is loaded as per standard depth.

2. Collect and Stock fingerlings	3.1 Species are selected for culture as per site requirement; 3.2 Finger lings’ quality is selected and collected as per requirement; 3.3 Finger lings are transported to the site on the basis of maintaining <u>physical conditions</u>; 3.4 Physical conditions are tested and necessary measures are taken before release into the pond; 3.5 Water temperature of poly bags containing fingerlings and juveniles is adjusted in accordance with the temperature of water of pond; 3.6 Fish fingerlings or juveniles are introduced into the pond after sanitizing with salt or potassium; 3.7 Stocking density is monitored to prevent overcrowding, which can lead to poor growth and health issues; 3.8 Liming is ensured during cultural period for increasing pH value of water.
3. Execute management feed	4.1 Observation is carried out to check the physical conditions and mortality of fingerlings after 6 to 12 hours; 4.2 Feed Conversion Ratio (FCR) is analyzed on the basis of volume of fish; 4.3 Feeding schedule is determined as per requirement; 4.4 Feed is collected as per <u>types of species</u>; 4.5 Feed is provided on the basis of schedule, weather and standard procedure; 4.6 Observation of feeding waste is carried out; 4.7 Sampling weight is carried out to observe growth rate as per feeding.
4. Control disease	5.1 Identify <u>disease</u> on the basis of external and internal symptoms; 5.2 Regular health checking is carried out; 5.3 Water quality is tested with testing kits and different meter; 5.4 Balance food is provided to reduce disease; 5.5 <u>Anti pathogenic</u> measure is taken in case of external and internal injury as per guide line and standard procedure; 5.1 Severe affected fishes are isolated from the poly pond as per standard procedure.
5. Harvest fish	6.1 <u>Harvesting indices</u> of different fishes are properly determined based on the manual; 6.2 Different <u>harvesting methods</u> are identified and applied;

	6.3 Partial harvest and restockings are done on the basis of growth rate; 6.4 Processing of fish is done for marketing and consuming; 6.5 Used harvesting tools and equipment are stored in a designated place; 6.6 Record keeping of harvesting is done for marketing; 6.7 Cost effect analysis is done to identify profit or loss of project.
Range of Variables	
Variables	Range (may include but not limited to):
1. Factors	2.1 Climatic requirement 2.2 Topography 2.3 Accessibility 2.4 Water supply 2.5 Drainage 2.6 Facilities/amenities 2.7 Socio-economic condition 2.8 Soil ▪ Type ▪ Depth ▪ p^H level
2. Tools, equipment and materials	2.1 Tools ▪ Cutter ▪ Measuring tape ▪ Spade ▪ pH meters ▪ dissolved oxygen meters ▪ Small nets and scoops ▪ Tools for sorting and grading ▪ Water depth measuring tools ▪ Logbooks or digital tools for recording data on feeding, water quality, and other relevant parameters ▪ Thermometers a. Equipment ▪ Cast and Siene Nets ▪ Sorting and grading bins ▪ Cage ▪ Scoop net ▪ Weighing machine ▪ Plastic drum ▪ Hose pipe

	▪ Small boat ▪ Mechanical filter ▪ Compressor ▪ Diffuser ▪ Aeration bags or tanks ▪ Water quality sensors ▪ Disinfection equipment ▪ Secchi disk for water clarity measurement ▪ Life jackets or personal flotation devices ▪ Automatic feeders, hand feeders, or feeding trays. ▪ Different types of pumps ➢ Submersible pump ➢ Centrifugal pump ➢ Mud pump ▪ Mechanical and biological filters ▪ Welding machine ▪ Generator ▪ Padel wheel airator ▪ Control board ▪ Turbine airator 2.2 Materials ▪ Hdpe liner ▪ Rope ▪ Angle ▪ Gi pipe ▪ Fish feed ▪ Testing kits for ph, ▪ Dissolved oxygen, ▪ Ammonia, ▪ Nitrite, and nitrate levels ▪ First aid kit
3. Standard measurement	3.1 Dike slope 1:2 3.2 Slope of pond bottom 1' from dike to pit 3.3 Depth of pit 2' 3.4 Size of pit is 1/10 ratio of pond bottom area
4. Finger lings' quality	4.1 Following proper inbreeding system 4.2 Age and weight of parents 4.3 Age of fingerlings 4.4 Size and shape of fingerlings 4.5 Physical appearance
5. physical conditions	5.1 water temperature maintain for quality of fingerlings 5.2 Proper oxygen level

	5.3 Proper Amonia level 5.4 pH value 5.5 Proper density 5.6 Counting 5.7 Timing of transportation 5.8 Types of carrying media ▪ Oxynetted polybag ▪ Drum
6. Feed	6.1 Supplimentary feed ▪ Plant source feed ▪ Animal source feed 6.2 Formulated feed ▪ Floating feed ▪ Sinking feed ▪ Cramble feed
7. Type of Species	7.1 Saline water species ▪ Coral ▪ Shrimps ▪ Mugil ▪ Bata 7.2 Fresh water species ▪ Indian major carp ➤ Ruhi ➤ Catla ➤ Mrigel ➤ Caliboush ▪ Exotic fish ➤ Silver carp ➤ Bighead carp ➤ Grass carp ➤ Black carp ➤ Telapia ➤ Pangas ➤ Thai sarputi ➤ Common carp ➤ Thai koy ➤ Vietnumi koy/shoel ▪ Indeginous/ Cat fish ➤ Sings ➤ Magur ➤ Pabda ➤ Gholsha ➤ Tengra

	➤ Mola fish ➤ Deshi sharputi ➤ Boal ➤ Chitol ➤ Prawn
8. Requirement	8.1 Growing stages 8.2 Nutritional value 8.3 Body weight 8.4 Quantity 8.5 Quality 8.6 Size
9. Disease	9.1 Epizotig Ulcratic Syndrome (EUS) 9.2 Fins and gills rot 9.3 Dropsy 9.4 Argulosis 9.5 Fungul diseases 9.6 Viral diseases 9.7 Anchor disease 9.8 Antena and rostrum broken 9.9 External fouling 9.10 Sapronegnia
10. Anti pathogenic	10.1 Benzal onium Choloride (BKC) 10.2 Potasium per manganet (KMnO ₄) 10.3 Salt 10.4 Formaldehyde 10.5 Coper Sulphate (CuSO ₄) 10.6 Potas alam (Phitkhery)
11. Harvesting Indices	11.1 Desirable size of the fish attained 11.2 Physical appearance 11.3 Age 11.4 Weight
12. Harvesting methods	12.1 Manual 12.2 Mechanized
13. Harvesting Tools and Equipment	13.1 Different types of nets (cast net, sein net etc.) 13.2 Grading tray 13.3 Baskets or plastic crates 13.4 Hand gloves 13.5 Drum 13.6 Different types of traps 13.7 Angling
14. Processing	14.1 Cleaning 14.2 Sorting

	14.3 Carrying 14.4 Grading 14.5 Icing 14.6 Packaging
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	
1. Critical aspects of competency	1.1 Assessment required evidence that the candidate: 1.2 Select site 1.3 Prepare poly pond for culture 1.4 Collect and Stock fingerlings 1.5 Provide Feed to fish 1.6 control disease 1.7 Harvest fish
2. Underpinning knowledge	2.1 OSH 2.2 Hazards and types of hazards 2.3 Control hazard 2.4 Safe use of necessary tools, equipment and materials 2.5 Factors of site selection 2.6 Methods of polypond construction 2.7 Advantages of polypond system 2.8 Topography 2.9 Pond purification system 2.10 Predatory fishes 2.11 Type of species 2.12 Fingerlings and their quality 2.13 Physical conditions of fingerlings transportation 2.14 Feed Conversion Ratio (FCR) 2.15 Requirement for feeding schedule 2.16 Nutrition value of feed 2.17 Feeding system of different species 2.18 Methods to reduce bad smell of fishes 2.19 Effect of weather for feeding 2.20 Different disease of species 2.21 Effect of water quality on fish culture 2.22 Procedure to control disease 2.23 Effect of antipathogenic measure 2.24 Procedure of using antipathogenic 2.25 Harvesting indices 2.26 Harvesting methods 2.27 Fish processing 2.28 Necessity of cost analysis

3. Underpinning skills	3.1 Handling tools and equipment 3.2 Communication skills 3.3 Problem solving skills 3.4 Computation skills 3.5 Using different measuring tools 3.6 Applying the techniques of preparing ponds 3.7 Applying the techniques of selecting and collecting fingerlings 3.8 Applying the process of feeding fish 3.9 Applying the techniques of controlling disease 3.10 Applying the process of controlling the quality of water 3.11 Checking growth rate of fish 3.12 Processing fish after harvesting
4. Required attitude	4.1 Commitment to occupational health and safety 4.2 Sincere and honest to duties 4.3 Promptness in carrying out activities 4.4 Environmental concerns 4.5 Eagerness to learn farm operation 4.6 Tidiness and timeliness 4.7 Respect of peers and seniors in workplace 4.8 Communicate with peers and seniors in workplace
5. Resource implications	5.1 Workplace/Farm 5.2 Materials relevant to the proposed activity. 5.3 Outfits appropriate in applying safety measures 5.4 Quality water 5.5 Fish harvesting gears and nets 5.6 Equipment for water and fish health test 5.7 Internet facilities 5.8 Record book 5.9 Manuals, catalogs and magazine 5.10 Competency Based Learning Materials (CBLM)
6. Methods of assessment	Assessment methods may include but limited to: 6.1 Written Test 6.2 Demonstration 6.3 Oral questioning 6.4 Portfolio
7. Context of assessment	7.1 Competency assessment must be done in a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by a NSDA certified/nominated assessor.

Accreditation Requirements

Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

References

- a. Competency standard on Aquaculture of Australia with web address <https://www.Training.gov.au>
- b. Competency standard on Aquaculture of Philippine with web address <https://www.tesda.gov.ph>
- c. Syllabus on Agriculture and Aquaculture of Directorate of Youth Development.

Development of Competency Standard

The Competency Standards for National Skills Certificate Level-3 in Aquaculture is developed by NSDA on 17 - 22 January, 2024.

List of members in the development workshop:

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Validation of Competency Standard

The Competency Standards for National Skills Certificate Level-3 in Aquaculture is validated by NSDA on 30 January, 2024.

List of members in the validation workshop:

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