

FISH CAGE FARM MANAGEMENT

UNIT CODE: AQ/CU/AM/CR/08/6/B

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Manage Fish Cage Farm

Duration of Unit: 350 hours

Unit Description

This unit specifies the competencies required to apply food safety measures in managing fish cage farm, select a suitable cage farm site, set up the cages and stock them with fingerlings. It also involves managing the stocked fish and maintaining the cages in the lake.

Summary of Learning Outcomes

1. Apply food safety measures in managing fish cage farm
2. Design cage farm layout
3. Set up and configure cages in a water body
4. Stock cages with fish
5. Manage fish feeds and feeding
6. Manage fish stock health
7. Control theft and vandalism, predators and intrusive animals
8. Harvest fish stock
9. Maintain cages and prevent escapes
10. Maintain records

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Apply food safety measures in managing fish cage farm	<ul style="list-style-type: none">• Meaning of food safety• Importance of food safety• Principles of food safety• Prerequisite programmes<ul style="list-style-type: none">• Meaning, importance, categories and establishment of prerequisite programmes• Relevant programmes for fish cage farm management• Hazard analysis for fish cage farm<ul style="list-style-type: none">• Enterprise description	<ul style="list-style-type: none">• Written tests• Oral questioning• Observation• Third Party reports• Project• Practical tests

	<ul style="list-style-type: none"> • Product description • Layout of premises and surrounding environment • Development of flow diagram • Identification of hazards at each step of the flow diagram • Describing the hazard • Significance of hazards • Establishment of the HACCP plan for fish cage farm management <ul style="list-style-type: none"> • Identification of critical control points • Procedures for setting up critical control limits • Establishment monitoring procedures on the control limits • Establishment of corrective actions • Verification procedures • Record keeping • Validation procedures <p>Standards and legislations in food safety on managing fish cage farm</p>	
2. Design cage farm layout	<ul style="list-style-type: none"> • Definition • Cage culture systems <ul style="list-style-type: none"> • Classification of cage culture systems • Types of fish cages <ul style="list-style-type: none"> • Fixed cages • Floating (or surface) cages • Submersible cages • Submerged cages • Parts of a floating fish cage <ul style="list-style-type: none"> • Catwalk (service system) • Cage bag/net • Mooring system 	<ul style="list-style-type: none"> • Written • Oral • Observation • Portfolio of Evidence • Third party report

	<ul style="list-style-type: none"> • Anchoring • Floatation system • Ancillary structures • Common materials for pond construction <ul style="list-style-type: none"> • Wood (Wooden cages) • Steel (Steel made cages) • Plastic (Plastic made cages) • Factors to consider when designing a cage system <ul style="list-style-type: none"> • Frame • Shape • Size • Volume • materials • Basic cage farm layouts and designs – with examples • How to draw a basic cage farm layout plan <ul style="list-style-type: none"> • Factors to consider • Equipment and materials required • Details to be included in the designed plan • Advantages and disadvantages of cages 	
<p>3. Set up and configure cages in a water body</p>	<ul style="list-style-type: none"> • Site selection <ul style="list-style-type: none"> • Importance • Factors affecting site selection • Site selection methods • Location and configuration of cages • How to calculate cage set-up costs • Cage set-up equipment and materials • Steps involved in setting up of fish cages • Factors to consider during cage and farm set-up • Safety measures 	<ul style="list-style-type: none"> • Written tests • Oral presentation • Observation • Projects • Portfolio of Evidence • Third party report

	<ul style="list-style-type: none"> • Use of PPEs in pond construction • Carrying out basic first aid-cuts, blisters, CPR, fractures 	
4. Stock cages with fish	<ul style="list-style-type: none"> • Selection of candidate fish species for cage culture • Fish stocking densities under different culture systems • Sources of fry and fingerlings in Kenya • Factors affecting survival of fry and fingerlings • Practical handling and care of fish • Fish packaging and Transportation <ul style="list-style-type: none"> • Size sorting of fish and fingerlings • Transportation of live fish • Packing of fry and fingerlings • Packing of large fish • Acclimatization and stocking of fish and fingerlings • Post stocking monitoring <ul style="list-style-type: none"> • Behaviour • Handling mortalities 	<ul style="list-style-type: none"> • Oral questioning • Written tests • Practical tests • Projects • Portfolio of Evidence • Third party report
5. Manage fish feeds and feeding	<ul style="list-style-type: none"> • Nutritional requirements of commonly farmed fish • Types of fish feeds • Floating, sinking • Pellets, mash, flakes • Fish feeding methods • Hand feeding (broadcasting) • Automatic feeders • Demand feeders • Feeding rates, frequency and timing • Feed conversion efficiency and calculations (FCR) • Handling and feeding of caged fish • Fish sampling methods • Maintenance of fish feed and feeding records • Fish waste management 	<ul style="list-style-type: none"> • Oral questioning • Written tests • Practical tests • Projects • Portfolio of Evidence • Third party report

	<ul style="list-style-type: none"> • Disposal of solid wastes and cage debris • Disposal of dead fish • Disposal of feed bags and other wastes 	
6. Manage fish stock	<ul style="list-style-type: none"> • Water quality management <ul style="list-style-type: none"> • Physico-chemical parameters • Monitoring of water parameters • Fish sampling techniques • Disease problems in cage culture • Definition of disease • Common fish diseases in cages • Modes of disease transmission • Clinical symptoms of stress and disease in cultured fish • Common fish parasites <ul style="list-style-type: none"> • Ectoparasites • Endoparasites • Mechanical and Biological control of parasites • Common bacterial and viral diseases in cultured fish. • Approved drugs in Cage culture <ul style="list-style-type: none"> • Application methods • Bio-security procedures in a cage farm 	<ul style="list-style-type: none"> • Written tests • Oral presentation • Observation • Projects • Portfolio of Evidence • Third party report
7. Control theft and vandalism, predators and intrusive animals	<ul style="list-style-type: none"> • Fish predators and intrusive animals <ul style="list-style-type: none"> • Difference between predators and intrusive animals • Types of predators and their behaviour • Types and behaviour of intrusive animals • Methods of controlling predators and Intruders • Methods of preventing theft and vandalism 	<ul style="list-style-type: none"> • Written tests • Oral presentation • Observation • Projects • Portfolio of Evidence • Third party report

<p>8. Harvest fish stock</p>	<ul style="list-style-type: none"> • Factors to consider before harvesting fish • Tools, equipment and materials used during fish harvests • Fish sampling techniques • Harvesting procedures <ul style="list-style-type: none"> • Starving of fish • Fish crowding • Harvesting methods • Handling of harvested fish <ul style="list-style-type: none"> • Sorting and grading of fish • Stress minimization • Maintenance of harvesting records • Cleaning, packing and transportation of harvested fish • Handling and storage of equipment, drugs and chemicals 	<ul style="list-style-type: none"> • Oral questioning • Written tests • Practical tests • Projects • Portfolio of Evidence • Third party report
<p>9. Maintain cages and prevent escapes</p>	<ul style="list-style-type: none"> • Preparation of cage management plans • Development of farm security plan <ul style="list-style-type: none"> • Definition • Contents of a farm security plan • Tools, equipment and materials required for cage maintenance • Cleaning of cages, catwalks and other structures • Prevention of waste build-up in cages • Common causes of cage damage <ul style="list-style-type: none"> • Intruders and predators • Vandalism • Wave action • Aquatic weeds – water hyacinth) • Collisions with boats and floating debris • Identification and repairs of cages and other structures 	<ul style="list-style-type: none"> • Oral questioning • Written tests • Practical tests • Projects • Portfolio of Evidence • Third party report

10. Maintain records	<ul style="list-style-type: none"> • Types of records on a fish farm • Factors to consider when designing records • Record storage methods • Use of Counter books • Use of computer software 	<ul style="list-style-type: none"> • Written • Oral • Observation • Portfolio of Evidence • Third party report
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Suggested Methods of Instruction

- Instructor led facilitation of theory
- Demonstration by trainer
- assignment
- Viewing of related videos
- Group discussions
- Project

Recommended Resources

Reference Materials

- Manual standard operating procedures for risk management
- Statutory requirements and standards for establishment of fish cage farm
- Fish stocking plan
- Work place requirements
- FAO guidelines for Fish Management

Tools and equipment

Measuring tape, weighing scale, DO meter, pH meter, ammonia test kits, aeration equipment, dip nets, automatic feeders, demand feeders.

traps and scarecrows, cover net, predator nets, acoustic deterrence devices, visual deterrence devices, pressure washer, scrubbing brush, paint brush,

Materials and supplies

Ropes and strings, liners, pegs, plumbing materials, lime, cement, sand, roofing materials, fencing wire, fittings, assorted screens, netting materials, anti-corrosive paints, screens, containers, twines, disinfectants

Personal protective equipment (PPEs)

Safety goggles, gum boots, helmets, gloves, overalls, first aid kits, mouth piece, life jackets, life ring, dustcoat