

MANAGE FISH CAGE FARM

UNIT CODE: AQ/OS/AT/CR/08/6/B

UNIT DESCRIPTION

This unit specifies the competencies required to manage fish cage farm. It involves conducting fish cage farm site Food safety risk assessment, developing fish cage farm site food safety risk management plan, designing cage farm layout, setting up and configure cages in a water body, stocking cages with fish, managing fish feeds and feeding, managing fish stock health, controlling theft and vandalism, predators and intrusive animals, harvesting fish stock, maintaining cages and prevent escapes, and evaluating fish cage farm set up.

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Conduct fish cage farm site food safety risk assessment	1.1 Fish cage farm site and riparian land <i>hazards</i> are identified and documented. 1.2 Possible <i>sources</i> of physical, chemical and microbial contamination are identified based on <i>use of the riparian land</i> . 1.3 Level of risk is assessed and established as per manual standard operating procedures
2. Develop fish cage farm site food safety risk management plan	2.1 <i>Preventive measures</i> for fish cage farm site hazards are established as per identified source of contamination and manual standard operating procedures 2.2 Standard operating procedures for correcting and preventing fish cage farm site risks are developed based on the identified risks/ <i>hazards</i> . 2.3 Fish cage farm site food safety status is evaluated based on statutory requirements and standards 2.4 Risk is communicated as per policies for internal and external communication 2.5 Approval and certification of fish cage farm site is sought from relevant certification bodies based on <i>statutory requirements</i> and standards
3. Design cage farm layout	3.1 Baseline survey is conducted to select cage farming site based on its suitability and food safety risk assessment

	<p>3.2 Cage management plan is prepared in compliance with food safety risk management plan and environmental regulations</p> <p>3.3 Fish cages and <i>ancillary farm structures</i> are designed in accordance with scale of operation, environmental considerations</p> <p>3.4 Cages set up costs are worked out based on client's budget.</p> <p>3.5 <i>Tools, equipment, materials</i> and <i>supplies</i> are identified and gathered based on job requirements.</p> <p>3.6 <i>Statutory requirements</i> are established and necessary <i>permits</i> acquired from relevant authorities.</p>
4 Set up and configure cages in a water body	<p>4.1 <i>PPEs</i> are identified and gathered as per task requirement</p> <p>4.2 Safety precautions are adhered to in line with Occupational Safety and Health Policy Guidelines.</p> <p>4.3 <i>Tools, equipment and materials</i> are assembled in line with task requirement</p> <p>4.4 Cages are assembled onshore according to instructions in the user manual</p> <p>4.5 Assembled cages are set up at the approved site following design specifications</p> <p>4.6 Ancillary structures are constructed or installed based on the farm design specifications</p> <p>4.7 Predator control devices are installed as per best management practices</p>
5 Stock cages with fish	<p>5.1 <i>Stocking plan</i> is prepared as per the capacity of the culture units to be stocked</p> <p>5.2 Number of required fingerlings is calculated based on number and size of cages, and stocking densities</p> <p>5.3 Stocking order of cages is determined based on the stocking plan</p> <p>5.4 Fingerlings are sourced from approved hatcheries</p> <p>5.5 Fingerlings are transported to the cage farm under controlled temperatures and aeration.</p> <p>5.6 Fingerlings are quarantined in specially designated tanks onshore</p> <p>5.7 Fingerlings are acclimatized based on water temperatures inside respective cages</p> <p>5.8 Fingerlings are gently released in to cages as per the stocking plan</p> <p>5.9 Stocked cages are monitored for fingerling stress and mortalities through direct observations</p>
6 Manage fish feeds and feeding	<p>6.1 Tools, equipment and materials are assembled in line with task requirement</p> <p>6.2 Fish feeding schedule is developed based on the cultured fish species</p>

	<p>6.3 Fish are fed as per the feeding schedule using appropriate method</p> <p>6.4 Fish feed consumption is monitored and appropriate actions taken based on prevailing weather conditions and fish behavior</p> <p>6.5 Feeding ration adjustments are calculated based on results from periodic fish sampling and weight measurements</p> <p>6.6 Feeds supplies are handled and stored according to manual of standard operating procedures</p> <p>6.7 Accurate feeding, fish biomass and inventory records are maintained according to work place requirements</p> <p>6.8 A comprehensive stress-management program is developed and implemented</p> <p>6.9 Water quality parameters are monitored and remedial measures undertaken in accordance with target species optimum ranges</p>
7 Manage fish stock health	<p>7.1 Fish are checked for signs of stress and disease based on physical appearance and behavioral changes</p> <p>7.2 Remedial measures for stressed and diseased fish are undertaken as per Food and Agriculture Organization (FAO) guidelines</p> <p>7.3 Water quality parameters are monitored and remedial measures undertaken in accordance with target species optimum ranges</p> <p>7.4 Biosecurity measures are put in place to prevent disease outbreaks in compliance with Public Health Act (CAP 242)</p> <p>7.5 Biosecurity plan and biosecurity agreements with neighboring cage farms developed based on the Animal Diseases Control Act (CAP 364) and Kenya Veterinary Policy (2015)</p> <p>7.6 Drugs and chemicals are handled, stored, and disposed of according to standard operating procedures</p>
8 Control theft and vandalism, predators and intrusive animals	<p>8.1 <i>Fish predators and intrusive animals</i> are identified</p> <p>8.2 <i>Control measures</i> for predators and intrusive animals are put in place</p> <p>8.3 Measures are put in place to minimize theft and vandalism</p>
9 Harvest fish stock	<p>9.1 <i>Harvesting plan</i> is prepared as per the identified market demand</p> <p>9.2 <i>Harvesting tools, equipment and materials</i> are assembled in line with task requirement</p> <p>9.3 Harvesting of fish is carried out using appropriate equipment and techniques</p> <p>9.4 Harvested fish is sorted according to size and species</p>

10 Maintain cages and prevent escapes	<p>10.1 Maintenance tools, equipment and materials are assembled as per the task requirements</p> <p>10.2 Cages are checked at intervals for signs of damage, tear and wear, and repairs or replacements done.</p> <p>10.3 Farm security plan is developed and implemented</p> <p>10.4 Cages are secured using appropriate anchoring techniques</p> <p>10.5 Cages are cleaned onshore using appropriate cleaning techniques</p>
11 Maintain records	<p>11.1 Different types of records are maintained based on the scale of the farm</p> <p>11.2 Records are reviewed regularly to provide insights into opportunities for improved operations</p>
12. Evaluate fish cage farm set up	<p>12.1 Fish cage farm set up is evaluated based on food safety standards</p> <p>12.2 Fish cage farm set up is approved for compliance to statutory requirements by relevant authorities</p>

RANGE

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

Variable	Range
1. Hazards may include but not limited to:	<ul style="list-style-type: none"> • Physical • Chemical <ul style="list-style-type: none"> ○ Bio-accumulation of heavy metals ○ Agricultural chemicals ○ Industrial chemicals • Microbial <ul style="list-style-type: none"> ○ Viruses ○ Bacteria ○ Parasitic worms and protozoa • Naturally occurring toxins
2. Sources of hazards may include but not limited to:	<ul style="list-style-type: none"> • Soil erosion/ Runoff • Toxic aquatic plants • Fecal matter • Industrial effluents • Agricultural effluents

3. Use of riparian land may include but not limited to:	<ul style="list-style-type: none"> • For animal feeding or domestic animal production; • As a waste disposal site (garbage or toxic industrial waste) • As a sanitary waste management site • For mining activities, oil or gas extraction • For former agricultural activities
4. Preventive measures may include but not limited to:	<ul style="list-style-type: none"> • Establish cages in recommended sites • Personnel hygiene and health
5. Statutory requirements may include but not limited to:	<ul style="list-style-type: none"> • Compliance to standards and regulations • Kenya Fisheries Service • County Government • The Fisheries Management and Development Act No.35 of 2016. • The Codex Alimentarius Food Hygiene Basic Texts; • The Food Drugs and Chemical Substances Act Cap. 254 of the Laws of the Kenya; • The Pest Control Products Act, Cap. 346 of the Laws of Kenya; • The Public Health Act, Cap. 242 of the Laws of Kenya; • The Environmental Management and Co-ordination Act, 1999.
6. Ancillary structure may include but not limited to:	<ul style="list-style-type: none"> • Supplementary aeration, dip nets, screens, automatic feeders, demand feeders, screens, containers, ramps
7. PPEs may include but not limited to:	<ul style="list-style-type: none"> • Safety goggles, gum boots, helmets, gloves, dust coats, first aid kits, industrial mouth piece, life jackets
8. Tools, equipment and materials may include but not limited to:	<ul style="list-style-type: none"> • Measuring tape, weighing scale, DO meter, pH meter, ammonia test kits, Supplementary aeration, dip nets, screens, automatic feeders, demand feeders, screens, containers.
9. Stocking plan may include but not limited to:	<ul style="list-style-type: none"> • Species of fish, stocking density, source of fingerlings, stocking schedule
10. Fish predators and intrusive animals may include but not limited to:	<ul style="list-style-type: none"> • Birds, mammals, reptiles, amphibians, invertebrates,

11. Control measures may include but not limited to:	<ul style="list-style-type: none"> traps and scarecrows, cover net, twines, Predator nets, acoustic deterrence devices, visual deterrence devices, dogs as a deterrent
12. Harvesting plan may include but not limited to:	<ul style="list-style-type: none"> Quantities to harvest Time of harvest Size to harvest Culture unit to harvest Partial or complete
13. Harvesting tools, equipment and materials may include but not limited to:	<ul style="list-style-type: none"> Seine net, scoop net, buckets, laundry baskets, weighing scale, perforators, boat
14. Maintenance tools, equipment and materials may include but not limited to:	<ul style="list-style-type: none"> Scrubbing brush, paint brush, anti-corrosive paints, pressure washer
15. Records may include but not limited to:	<ul style="list-style-type: none"> Feeding, inventory, fish movements, operations (stocking/harvesting), chemical use, water quality (e.g. Temperature and Dissolved Oxygen)

REQUIRED SKILLS AND KNOWLEDGE

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

Required Skills

The individual needs to demonstrate the following skills:

- Use of tools and equipment
- Food safety risk assessment and communication
- Training skills
- Measuring
- Fish handling
- Record keeping
- Fish feeding
- Predator control
- Fish harvesting
- Communication
- Basic first aid
- Numeracy
- Swimming and diving
- Conflict resolution

Required Knowledge

The individual needs to demonstrate knowledge of:

- Codes of Practice
- Hazard Analysis Critical Control Points (HACCP)
- Food Safety Hazards in Aquaculture
- Good aquaculture practices
- Good hygiene practices
- Safety precautions
- Principles of food hygiene
- National legislations and regulations
- Types of tools, equipment and PPEs
- Fish disease
- Basic fish biology
- Fish feeds and feeding methods
- Water quality parameters
- Fish predators and intrusive animals
- Aquatic weeds
- First aid
- Ecology

EVIDENCE GUIDE

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

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Developed fish cage farm site food safety risk management plan 1.2 Conducted baseline survey to select cage farming site based on specified factors. 1.3 Prepared Cage management plan in compliance with NEMA regulations 1.4 Designed fish cages and ancillary farm structures in accordance with scale of operation, environmental considerations 1.5 Worked out cages set up costs based on client's budget 1.6 Set up assembled cages at the selected site following design specifications 1.7 Installed predator control devices as per best management practices 1.8 Prepared stocking plan as per the capacity of the culture units to be stocked
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	<p>1.9 Calculated number of required fingerlings based on number and size of cages, and stocking densities</p> <p>1.10 Quarantined fingerlings are in specially designated tanks onshore</p> <p>1.11 Acclimatized fingerlings based on water temperatures inside respective cages</p> <p>1.12 Developed fish feeding schedule based on the cultured fish species</p> <p>1.13 Fed fish as per the feeding schedule using appropriate method</p> <p>1.14 Calculated feeding ration adjustments based on results from periodic fish sampling and weight measurements</p> <p>1.15 Undertook remedial measures for stressed and diseased fish as per Food and Agriculture Organization (FAO) guidelines</p> <p>1.16 Put in place biosecurity measures to prevent disease outbreaks in compliance with Public Health Act (CAP 242)</p> <p>1.17 Put in place <i>Control measures</i> for predators and intrusive animals</p> <p>1.18 Carried out harvesting of fish using appropriate equipment and techniques</p> <p>1.19 Checked cages at intervals for signs of damage, tear and wear, and repairs or replacements done</p> <p>1.20 Cleaned cages onshore using appropriate cleaning techniques Maintained Different types of <i>records</i> based on the scale of the farm</p>
<p>2. Resource Implications</p>	<p>The following resources must be provided:</p> <p>2.1 Workplace or assessment location</p> <p>2.2 PPEs</p> <p>2.3 Tools, materials and equipment</p> <p>2.4 Writing materials</p> <p>2.5 Calculator</p>
<p>3. Methods of Assessment</p>	<p>Competency may be assessed through:</p> <p>3.1 Observation</p> <p>3.2 Oral questioning</p> <p>3.3 Projects</p> <p>3.4 Written tests</p> <p>3.5 Portfolio of Evidence</p> <p>3.6 Interview</p> <p>3.7 Third party report</p>

4. Context of Assessment	Competency may be assessed: 4. 1 On-the-job 4. 2 Off-the –job 4. 3 During Industrial attachment
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

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