

# Model Curriculum

## Cage Culture Fish Farmer

(Option: Basic Seamanship and Navigation)

**SECTOR:** Agriculture and Allied  
**SUB-SECTOR:** Fisheries  
**OCCUPATION:** Aquaculture  
**REF ID:** AGR/Q4916, v1.0  
**NSQF LEVEL:** 4



## Certificate

### CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

**AGRICULTURE SKILL COUNCIL OF INDIA**

for the

**MODEL CURRICULUM**

Complying to National Occupational Standards of

Job Role/ Qualification Pack: 'Cage Culture Fish Farmer' QP No. 'AGR/ Q4916, v1.0 NSQF Level 4'

Date of Issuance: December 16<sup>th</sup> ,2019

Valid up to: December 16<sup>th</sup> ,2023

\* Valid up to the next review date of the Qualification Pack

  
Authorised Signatory  
(Agriculture Skill Council of India)

## TABLE OF CONTENTS

<b>1. Curriculum</b>	<b>01</b>
<b>2. Trainer Prerequisites</b>	<b>09</b>

# Cage Culture Fish Farmer

## CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Cage Culture Fish Farmer”, in the “Agriculture” Sector/Industry and aims at building the following key competencies amongst the learner

<b>Program Name</b>	<b>Cage Culture Fish Farmer</b>		
<b>Qualification Pack Name &amp; Reference ID</b>	AGR/Q4916, v1.0		
<b>Version No.</b>	1.0	<b>Version Update Date</b>	16/12/2019
<b>Pre-requisites to Training</b>	Ability to read and write		
<b>Training Outcomes</b>	<p><b>After completing this programme, participants will be able to:</b></p> <p><b>Compulsory:</b></p> <ul style="list-style-type: none"> <li>• Select the site, type of cage and cage materials required for cage culture fish farming</li> <li>• Fabricate and install the cage</li> <li>• Select and stock the species.</li> <li>• Manage feed, health, hygiene and safety of spawn/ seedlings at various level of growth/ maturity</li> <li>• Maintain and repair the cage</li> <li>• Harvest, market and sell the fish</li> <li>• Maintain personal hygiene and safety</li> </ul> <p><b>Option 1: Basic seamanship and navigation</b></p> <ul style="list-style-type: none"> <li>• Perform mooring and rigging and watch keeping activity.</li> </ul>		

This course encompasses 5 out of 5 Compulsory NOS (National Occupational Standards) and 1 of 1 Optional NOS of “Cage Culture Fish Farmer” Qualification Pack issued by “Agriculture Skill Council of India”.

#### COMPULSORY NOS:

Sr. No.	Module	Key learning outcomes	Equipment Required
1.	<b>Introduction to cage culture fish farming</b>  <b>Theory Duration</b> (hh:mm) 02:00  <b>Practical Duration</b> (hh:mm) 00:00  <b>Corresponding NOS Code</b> Bridge Module	<ul style="list-style-type: none"> <li>Explain the size, scope and importance of cage culture fish farming.</li> <li>State various employment and business opportunities in cage culture fish farming.</li> <li>State the role and responsibilities of a cage culture fish farmer.</li> </ul>	
2.	<b>Basics of cage culture fish farming</b>  <b>Theory Duration</b> (hh:mm) 04:00  <b>Practical Duration</b> (hh:mm) 00:00  <b>Corresponding NOS Code</b> AGR/N4953	<ul style="list-style-type: none"> <li>State the advantages and disadvantages of cage culture.</li> <li>Differentiate between marine, brackish and freshwater cage culture.</li> <li>Describe the different types of cage frames and their application.</li> <li>Describe the various materials that are used for the fabrication of cages and their application.</li> <li>Describe the various shapes of cages and the application of the shapes.</li> <li>State the guidelines, policies and legislation governing cage culture activities in India.</li> </ul>	Sample submerged, submersible, fixed and floating cages of HDPE, GI pipes, LDPE and steel materials of various shapes.
3.	<b>Preparation for cage culture fish farming</b>  <b>Theory Duration</b> (hh:mm) 04:00  <b>Practical Duration</b> (hh:mm) 16:00  <b>Corresponding NOS Code</b> AGR/N4953	<ul style="list-style-type: none"> <li>Describe the criteria for the selection of site.</li> <li>Describe the criteria for the selection of type, shape and size of cage.</li> <li>List the various tools and equipment required for various cage farming activities.</li> </ul>	Cage frames for submerged, submersible, fixed and floating cages made of HDPE, GI pipes, LDPE and steel; PVC pipes, straight, rigid and light bamboo poles, PVC drums to be used as floats, sinkers to help maintain the cage-shape, mooring blocks weighing 40-50

Sr. No.	Module	Key learning outcomes	Equipment Required
			kgs to be used as anchors, etc.
4.	<b>Cage Setup</b>  <b>Theory Duration</b> (hh:mm) 04:00  <b>Practical Duration</b> (hh:mm) 22:00  <b>Corresponding NOS Code</b> AGR/N4953	<ul style="list-style-type: none"> <li>Describe the process of construction and installation of various types of cages used in cage culture.</li> <li>State the considerations to be taken while dragging the cage into the water body, fastening the floats, anchoring the frame, tying the nets and suspending the cage into the water.</li> <li>Demonstrate the installation of a cage in the water body.</li> <li>Identify predators of fish in cage culture.</li> <li>Describe ways protect the culture from various predators.</li> <li>Demonstrate the application of the various measures for protection from predators.</li> </ul>	High density poly Ethylene (HDPE) pipes, Galvanised iron (GI) pipes, PVC pipes, straight, rigid and light bamboo poles, PVC drums to be used as floats, sinkers to help maintain the cage-shape, mooring blocks weighing 40-50 kgs to be used as anchors, anchor ropes, iron chains, shackles, net-cages, hand tool kit, epoxy paint, mechanical filters, Respiratory Masks/ Snorkel, etc.
5.	<b>Selection and stocking of fish species</b>  <b>Theory Duration</b> (hh:mm) 04:00  <b>Practical Duration</b> (hh:mm) 16:00  <b>Corresponding NOS Code</b> AGR/N4954	<ul style="list-style-type: none"> <li>Describe the criteria of selecting species for cage culture.</li> <li>List species of fish that can be bred in marine, brackish and freshwater.</li> <li>List types of authorised agencies for procurement of healthy seeds.</li> <li>Define stocking density.</li> <li>Describe the criteria for selecting the correct method for stocking and maintaining optimum stock density.</li> <li>Demonstrate various methods of stocking fingerlings and maintaining optimum stock density.</li> </ul>	Fertile eggs, storage and cooler room, fumigation chamber, setters, egg candler
6.	<b>Health management of fish species</b>	<ul style="list-style-type: none"> <li>Describe the procedure of maintaining fish in cage culture.</li> <li>Explain the importance of planning and following a feeding schedule for the entire life span of the fish.</li> </ul>	Fertile eggs, storage and cooler room, fumigation chamber,

Sr. No.	Module	Key learning outcomes	Equipment Required
	<p><b>Theory Duration</b> (hh:mm) 08:00</p> <p><b>Practical Duration</b> (hh:mm) 24:00</p> <p><b>Corresponding NOS Code</b> AGR/N4954, AGR/N4918</p>	<ul style="list-style-type: none"> <li>State the nutritional requirements and feeding practices of the common cage culture fish species at various stages of growth.</li> <li>Describe the methods of preparing and storing the feed.</li> <li>Prepare fish feed maintaining the required levels of nutrition, for the common cage culture fish species at various stages of growth.</li> <li>Demonstrate the process of feeding fish.</li> <li>Identify health, stress and disease indicators for effective monitoring of fish health.</li> <li>Demonstrate the process of sampling fish to check their length, weight, health indicators and identify growth stage.</li> <li>Describe the growth enhancement practices that can be adopted for fish in cage culture.</li> <li>State the common sources of bacterial and other contamination of the fish.</li> <li>Describe ways to handle/treat stress and diseases in the culture.</li> <li>Demonstrate the ways to cure diseases identified in culture.</li> <li>Describe the process of labelling and storing medicines and chemicals.</li> </ul>	setters, egg candler, feeding trays / boxes, vaccine, vaccinator, record book, chemicals, cage culture fish samples at various growth stages respiratory masks/ snorkel
7.	<p><b>Cage Maintenance</b></p> <p><b>Theory Duration</b> (hh:mm) 08:00</p> <p><b>Practical Duration</b> (hh:mm) 20:00</p> <p><b>Corresponding NOS Code</b> AGR/N4949</p>	<ul style="list-style-type: none"> <li>Describe the maintenance requirements of cages.</li> <li>List various fouling sedentary and semi-sedentary organisms.</li> <li>Describe the impact of these organisms on the culture.</li> <li>Demonstrate the removal of spoilt organisms, without releasing or harming the culture.</li> <li>Demonstrate the removal of obstructions in the cage, to allow free flow of water currents, without releasing or harming the culture.</li> <li>Demonstrate the ways to repair and replace commonly damaged parts of a cage, without releasing or harming the culture fish.</li> </ul>	Mechanical filters, tubers, power backup, grinder, mixer, pelletiser, weed eradication equipment, respiratory masks/ snorkel, spare parts of cage material for replacement and repair activities.
8.	<p><b>Harvesting of fish</b></p> <p><b>Theory Duration</b> (hh:mm) 04:00</p> <p><b>Practical Duration</b> (hh:mm)</p>	<ul style="list-style-type: none"> <li>Describe the factors impacting fish growth.</li> <li>Describe the indicators of readiness of fish for harvesting.</li> <li>Describe the do's and don'ts to be adhered to during fish harvesting.</li> <li>Demonstrate harvesting of fish in a safe manner.</li> </ul>	PPE, bags, hand nets, cast nets, dip nets, hand gloves, boots, head gear, autoclave, transport vehicle with

Sr. No.	Module	Key learning outcomes	Equipment Required
	16:00 <b>Corresponding NOS Code</b> AGR/N4948	<ul style="list-style-type: none"> <li>Describe the quality parameters for sorting of harvested fish.</li> <li>Describe the methods for sorting and grading based on specified quality criteria.</li> <li>Demonstrate the process of sorting harvested fish based on the specified quality parameters.</li> <li>Demonstrate different ways of grading the sorted fish.</li> <li>Demonstrate the procedure of discarding the damaged and infected fish in compliance with the local legislation.</li> <li>Demonstrate maintenance of records of the harvested fish.</li> </ul>	water storage capacity, oxygen cylinders, ropes, siphoning pipes etc.
9	<b>Storage and transportation of fish</b>  <b>Theory Duration</b> (hh:mm) 04:00  <b>Practical Duration</b> (hh:mm) 08:00  <b>Corresponding NOS Code</b> AGR/N4948	<ul style="list-style-type: none"> <li>Describe the various hazards with respect to the fish produce during storage and transportation.</li> <li>List the equipment and facilities required for storage.</li> <li>List the equipment and facilities required for transportation of fish.</li> <li>Describe the various procedures adopted to protect the harvested fish during storage.</li> <li>Describe the various procedures adopted to protect the harvested fish during transportation.</li> <li>Demonstrate the storage procedures for the harvested fish.</li> <li>Demonstrate the transportation procedures for the harvested fish.</li> <li>State the considerations for safe and timely transportation of fish to the buyers/aggregators.</li> </ul>	PPE, bags, hand nets, cast nets, dip nets, hand gloves, boots, head gear, autoclave, transport vehicle with water storage capacity, oxygen cylinders, ropes, siphoning pipes, etc.
10.	<b>Marketing of fish</b>  <b>Theory Duration</b> (hh:mm) 04:00  <b>Practical Duration</b> (hh:mm) 12:00  <b>Corresponding NOS Code</b> AGR/N4948	<ul style="list-style-type: none"> <li>Identify the demand and market rate for the harvested fish.</li> <li>Identify the fish buyers and aggregators for domestic and international sales.</li> <li>Describe the key principles and groundwork for effective negotiation of the price of harvested fish.</li> <li>Demonstrate how to negotiate the price with the buyer.</li> <li>Describe the procedure and precautions for various methods of taking payment from buyers/aggregators.</li> <li>Discuss the ways to maintain sale records.</li> <li>Prepare sale records using a set of sample data.</li> <li>Calculate the benefit-cost ratio (BCR) ratio for the cage culture operations.</li> </ul>	

Sr. No.	Module	Key learning outcomes	Equipment Required
11.	<p><b>Ensure Safety, hygiene and sanitation practices for culture operations</b></p> <p><b>Theory Duration</b> (hh:mm) 04:00</p> <p><b>Practical Duration</b> (hh:mm) 16:00</p> <p><b>Corresponding NOS Code</b> AGR/N4918</p>	<ul style="list-style-type: none"> <li>State the various health and safety hazards at the cage culture site.</li> <li>Describe the measures for healthy and hygienic conditions during all the stages of fish growth, transportation and marketing.</li> <li>State the common breaches of protection that could occur at the cage culture site.</li> <li>State the measures to prevent cannibalism in the water body.</li> <li>Demonstrate the routine tests for virus infections.</li> <li>Explain the importance of ensuring that all items used in culture activities are decontaminated and clean.</li> <li>State the security threats at cage culture site.</li> <li>State the suitable materials for fencing of the water body to protect fish during fish culture.</li> <li>Demonstrate various security measures for prevention of theft/sabotage.</li> <li>Demonstrate personal hygiene measures for all the activities.</li> </ul>	Respiratory masks, rubber gloves, bandages, adhesive bandage, antiseptic ointment/ liquid, pain relief spray/ ointment, fire extinguisher
	<p><b>COMPULSORY NOS:</b></p> <p><b>Total Duration:</b> (hh:mm) 200:00</p> <p><b>Theory Duration</b> (hh:mm) 50:00</p> <p><b>Practical Duration</b> (hh:mm) 150:00</p>	<p><b>Unique equipment required:</b></p> <p>Sample submerged, submersible, fixed and floating cages of HDPE, GI pipes, LDPE and steel materials of various shapes; Cage frames for submerged, submersible, fixed and floating cages made of HDPE, GI pipes, LDPE and steel; PVC pipes, straight, rigid and light bamboo poles, PVC drums to be used as floats, sinkers to help maintain the cage-shape, mooring blocks weighing 40-50 kgs to be used as anchors; anchor ropes, iron chains, shackles, net-cages, hand tool kit, epoxy paint, mechanical filters, storage and cooler room, fumigation chamber, setters, egg candler, fish seeds/fertile eggs, feeding trays / boxes, vaccine, vaccinator, record book, chemicals, cage culture fish samples at various growth stages, respiratory masks/ snorkel, mechanical filters, tubers, power backup, grinder, mixer, pelletiser, weed eradication equipment, spare parts of cage material for replacement and repair activities; personal protective equipment (rubber hand gloves, boots, head gear), bags, hand nets, cast nets, dip nets, autoclave, transport vehicle with water storage capacity, oxygen cylinders, ropes, siphoning pipes, bandages, adhesive bandage, antiseptic ointment/ liquid, pain relief spray/ ointment, fire extinguisher.</p>	

**OPTIONS (Optional to choose any or all or none)**
**OPTION 1: Basic seamanship and navigation**

Sr. No.	Module	Key learning outcomes	Equipment Required
1.	<b>Basic seamanship and navigation activities</b>  <b>Theory Duration</b> (hh:mm) 10:00  <b>Practical Duration</b> (hh:mm) 20:00  <b>Corresponding NOS Code</b> AGR/N5015	<ul style="list-style-type: none"> <li>• Interpret the various nautical terms related to navigation.</li> <li>• Describe the different types of vessels used in deep sea fishing.</li> <li>• Identify the layout, parts and components of a typical shipping vessel.</li> <li>• Identify safe and unsafe zones in a typical shipping vessel.</li> <li>• Differentiate different types of heaving lines from vessel and berth.</li> <li>• Demonstrate sequence of vessel mooring activities.</li> <li>• Describe sequence of rope work involved and tools/equipment used in mooring.</li> <li>• List the safety procedures to be undertaken during mooring.</li> <li>• Discuss mooring documentation.</li> <li>• Describe the use of knotting, splicing and stoppers in rigging.</li> <li>• Make various rigging knots, bends, hitches and whipping on ends of the rope, and various splices of ropes.</li> <li>• Make and fit building grips like the 'U' of the grip.</li> <li>• Demonstrate rigging and unrigging of safety nets, rat guards, bosun's chair and pilot ladders securely.</li> <li>• Explain the use of blocks and tackles on the vessel to secure the fish and equipment during handling operations.</li> <li>• Operate hand-held radio.</li> <li>• Demonstrate flag, sound, hand and rope signal communication.</li> <li>• Use GPS, radar and maps to locate latitude and longitude position.</li> <li>• Use navigation maps for location identification and route mapping.</li> <li>• Explain the possible weather changes and obstacles in the course.</li> <li>• Demonstrate the preparation of watchkeeping reports.</li> <li>• Explain how to read the ocean currents and waves and the Beaufort scale for estimating the water state.</li> <li>• Demonstrate the use of barometer, thermometer, gyro and magnetic compass and hygrometer.</li> <li>• Demonstrate the use of AIS (automatic identification system)</li> </ul>	Training Kit (Presentations, Trainer Guide) GPS Receiver, sound reception system, navigational lights, ship whistle, daylight signalling lamp, pilot card, voyage plan, forecastle bell, manoeuvrings booklet, black ball shape, transmitting heading device, ship flags, RADAR, ECDIS, NAVTEX.); Communication equipment: (UHF/VHF transceivers, satellite phones and DTH, mobile phones, MF/HF/VHF RT set); fish finding equipment (fishfinder – echo sounder, fathometer, fish arches etc.); long line gear materials and accessories (details of mainline (PA monofilament), branch lines, snap line, swivel, secondary leader, snood wire with hook, light sticks, glow beads, float, float line, flag pole, radio buoys, light

Sr. No.	Module	Key learning outcomes	Equipment Required
			buoys, radar reflectors etc.)
	<b>Option 1:</b> <b>Total Duration:</b> (hh:mm) 30:00  <b>Theory Duration</b> (hh:mm) 10:00  <b>Practical Duration</b> (hh:mm) 20:00	<b>Unique equipment required:</b> GPS Receiver, sound reception system, navigational lights, ship whistle, daylight signalling lamp, pilot card, voyage plan, forecastle bell, manoeuvrings booklet, black ball shape, transmitting heading device, ship flags, RADAR, ECDIS, NAVTEX.); Communication equipment: (UHF/VHF transceivers, satellite phones and DTH, mobile phones, MF/HF/VHF RT set); fish finding equipment (fishfinder – echo sounder, fathometer, fish arches etc.); long line gear materials and accessories (details of main line (PA monofilament), branch lines, snap line, swivel, secondary leader, snood wire with hook, light sticks, glow beads, float, float line, flag pole, radio buoys, light buoys, radar reflectors etc.)	

	<b>GRAND Total Duration</b>  <b>Minimum Duration for the QP= 200 hrs</b> <b>Theory: 50 hrs</b> <b>Practical: 150 hrs</b>  <b>Maximum Duration for the QP= 230 hrs</b> <b>Theory: 60 hrs</b> <b>Practical: 170 hrs</b>	<b>Unique equipment required for the QP:</b> Sample submerged, submersible, fixed and floating cages of HDPE, GI pipes, LDPE and steel materials of various shapes; Cage frames for submerged, submersible, fixed and floating cages made of HDPE, GI pipes, LDPE and steel; PVC pipes, straight, rigid and light bamboo poles, PVC drums to be used as floats, sinkers to help maintain the cage-shape, mooring blocks weighing 40-50 kgs to be used as anchors; anchor ropes, iron chains, shackles, net-cages, hand tool kit, epoxy paint, mechanical filters, storage and cooler room, fumigation chamber, setters, egg candler, fish seeds/fertile eggs, feeding trays / boxes, vaccine, vaccinator, record book, chemicals, cage culture fish samples at various growth stages, respiratory masks/ snorkel, mechanical filters, tubers, power backup, grinder, mixer, pelletiser, weed eradication equipment, spare parts of cage material for replacement and repair activities; personal protective equipment (rubber hand gloves, boots, head gear), bags, hand nets, cast nets, dip nets, autoclave, transport vehicle with water storage capacity, oxygen cylinders, ropes, siphoning pipes, bandages, adhesive bandage, antiseptic ointment/ liquid, pain relief spray/ ointment, fire extinguisher, GPS Receiver, sound reception system, navigational lights, ship whistle, daylight signalling lamp, pilot card, voyage plan, forecastle bell, manoeuvrings booklet, black ball shape, transmitting heading device, ship flags, RADAR, ECDIS, NAVTEX.); Communication equipment: (UHF/VHF transceivers, satellite phones and DTH, mobile phones, MF/HF/VHF RT set); fish finding equipment (fishfinder – echo sounder, fathometer, fish arches etc.); longline gear materials and accessories (details of mainline (PA monofilament), branch lines, snap line, swivel, secondary leader, snood wire with hook, light sticks, glow beads, float, float line, flag pole, radio buoys, light buoys, radar reflectors etc.).  <b>Classroom aids required:</b> LCD Projector, marker, board, presentation software, trainer guide, participant handbook	
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(This syllabus/ curriculum has been approved by [Agriculture Skill Council of India](#))

## Trainer Prerequisites for Job role: “ Cage Culture Fish Farmer” mapped to Qualification Pack: “ AGR/Q4916 v1.0”

Sr. No.	Area	Details
1	<b>Description</b>	The trainer is responsible for educating the trainees in carrying out various activities for cage culture fish farming such as preparation and installation of the cage, fish health management, cage management, harvesting and marketing etc.
2	<b>Personal Attributes</b>	The trainer should have good communication, leadership, observation and practical oriented skills.
3	<b>Minimum Educational Qualifications</b>	10+2
4a	<b>Domain Certification</b>	Certified for Job Role: “ <u>Cage Culture Fish Farmer</u> ” mapped to QP: “ <u>AGR/Q4916, v1.0</u> ”. The minimum accepted score is 80%
4b	<b>Platform Certification</b>	Recommended that the Trainer is certified for the Job Role: “ <u>Trainer</u> ”, mapped to the Qualification Pack: “ <u>MEP/Q2601</u> ”. Minimum accepted as per respective SSC guidelines is 80%.
5	<b>Experience</b>	<ul style="list-style-type: none"> <li>• B.Sc. (Fisheries) with 1 Year of experience in the relevant field Or</li> <li>• B.Sc. (Zoology) with 2 Years of experience in the relevant field Or</li> <li>• Diploma in Fisheries with 3 Years of experience in the relevant field</li> </ul>