

Participant Handbook

Sector
Agriculture and Allied

Sub-Sector
Fisheries

Occupation

Aquaculture

Reference ID: **AGR/Q4904, Version 1.0**
NSQF Level 3



Aquaculture Worker

Published by

Mahendra Publication Pvt Ltd

Plot No. E- 42/43/44, Sector- 7,
Noida - 201301, Uttar Pradesh, India.

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First Edition, March 2016

ISBN 978-1-111-22222-45-7

Printed in India at

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Shri Narendra Modi
Prime Minister of India

“ Skilling is building a better India.
If we have to move India towards
development then Skill Development
should be our mission. ”



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SKILLING CONTENT : PARTICIPANT HANDBOOK

Complying to National Occupational Standards of
Job Role/ Qualification Pack: Aquaculture Worker QP No. 'AGR/Q4904 NSQF Level 3'

Date of Issuance: **Sep 30th 2016**

Valid up to*: **March 31st, 2018**

**Valid up to the next review date of the Qualification Pack or the
'Valid up to' date mentioned above (whichever is earlier)*

Authorised Signatory
(Agriculture Skill Council of India)

Acknowledgements

We are thankful to all organizations and individuals who have helped us in preparation of this Participant manual. We also wish to extend our gratitude to all those who reviewed the content and provided valuable inputs for improving quality, coherence and content presentation of chapters. This handbook will lead to successful roll out the skill development initiatives, helping greatly our stakeholders particularly trainees, trainers and assessors etc. We are thankful to our Subject Matter Expert **Dr. P C Das** who has given the content and helped us in preparation of Participant Handbook.

It is expected that this publication would meet the complete requirements of QP/NOS based training delivery, we welcome the suggestions from users, Industry experts and other stakeholders for any improvement in future.

About this book

An Aquaculture Worker is responsible for carrying out operations at an aqua-farm under the guidance of an aqua farm biologist. An Aquaculture Worker is responsible for providing assistance in maintenance of stock tanks, ensuring proper water intake, water treatment, pond preparation, farming of aquatic organisms, sampling, harvest and effluent treatment. The individual should be laborious and should have inclination to new learnings. Requires clarity and should be result oriented. The individual should also be able to demonstrate skills of using various tools and keep records as required. The trainee will enhance his/her knowledge under the guidance of the trainer in the following skills:

- **Knowledge and Understanding:** Adequate operational knowledge and understanding to perform the required task
- **Performance Criteria:** Gain the required skills through hands on training and perform the required operations within the specified standards
- **Professional Skills:** Ability to make operational decisions pertaining to the area of work.

The handbook incorporates well-defined roles of Aquaculture Worker like assist in performing pond preparation activities, culture of aquatic organisms, and ensures Health & Safety at the Green House etc. An Aquaculture Worker must possess physical strength, ability to understand instructions, good hand strength and stamina to work for long hours.

We wishes all the best for your future in the Aquaculture Sector

Symbols Used



Key Learning Outcomes



Steps



Time



Tips



Notes



Unit Objectives



Exercise

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1. Introduction

Unit 1.1 - Freshwater aquaculture sector in India

Unit 1.2 - Fish farming

Unit 1.3 - Job role of an Aquaculture worker



Key Learning Outcomes

At the end of this module, you will be able to:

- Discuss the freshwater aquaculture sector in India, and its sub-sectors
- Define your Roles and responsibilities
- Demonstrate how aquaculture operations can be performed
- Identify equipment required
- Identify ways of fish farming
- Demonstrate skills required for the job (behavioral, professional, technical and communication)
- Maintain a safe, hygienic and secure working environment

UNIT 1.1: Freshwater Aquaculture Sector In India

Unit Objectives

At the end of this unit, you will be able to:

- Know the freshwater pond resources of the country
- Know importance of aquaculture in supplying fish protein
- Know organizational structure of a fish farm
- Know employment opportunity available in the aquaculture sector

1.1.1 The freshwater sector

Fish production in India comes from three sectors, i.e., the sea or marine water, brackish water and freshwater sectors. Based on the methods of fish being produced the sectors are divided into two, i.e. capture fisheries and culture fisheries. The following table gives a schematic representation of the fish production sectors in the country.

Sectors		Capture	Culture
Inland Sector	Freshwater	Reservoir, river, canal, beels and other natural waters	i. ponds, tanks, small and medium reservoirs ii. Cage culture in river, canal, reservoir
	Brackishwater	Estuary, lake and lagoon	i. Culture in coastal area ii. Cage/pen culture in estuary
Marine Sector		Coastal and deep sea fishing	i. Cage culture of fish ii. Raft culture of sea weeds, mussels and oyster

Table 1.1.1 Freshwater sector - Aquaculture

Freshwater aquaculture resources in the country

Resources	Potential area	Scope
Ponds & Tanks	2.41 million ha	Seed rearing, Grow - out culture
Lakes & Reservoirs	3.15 m ha	Small: Grow - out culture Medium: Seed rearing in cage, Grow - out Large: Fingerling/stunted yearling in cage, cage grow -out culture, Culture based capture
Beels/derelict waters	1.07 m ha	Seed rearing, short term culture
Rivers		Cage aquaculture
Irrigation Canals	0.12 m km	Cage aquaculture

Table 1.1.1 Freshwater Aquaculture resources in the country

1.1.2 Importance of Freshwater Sector

- Fish is the cheapest source of animal protein.
- Demand for fish is increasing in the country.
- India requires 16 million metric tonnes of fish every year by 2025 against the present production of 9.58 million metric tonnes leaving a huge gap between future demand and supply.
- The present total fish production in country is 9.58 million metric tonnes leaving a huge gap between future demand and supply.
- Marine capture fish production has been stagnant over last decades while brackish water aquaculture mainly of prawn farming is mostly export oriented.
- Therefore, freshwater is the only sector to bridge the gap of fish demand and supply in the future.

1.1.3 Present Status of Freshwater Sector in the Country

India is one among the pioneer countries of the world to practice fish culture in ponds and tanks. Indian water has more than 900 freshwater species of fish of which many have culture potential. Approximately two dozen species are at present cultured in the freshwater ponds across the country. The carps form the major cultured group in the Indian ponds contributing approximately 75% of the total aquaculture production of the country. The group mainly consist of the three Indian major carps catla, rohu and mrigal and the three exotic carps silver carp, grass carp and common carp. The group also includes few minor carps which are popula on regional basis. Few of those include fringed lipped carp, kuri, kalbasu, bata, reba, cauvery carp, silver barb, olive barb and few others. Catfish id the second most cultured fish in the freshwater ponds. The group includes stripped catfish, magur, pabda, etc. The other major groups cultured in the freshwater sector are freshwater prawn, anabus, murrel, etc. The average fish production in the country is 2.9 tonnes/ha. With the present total fish production at 9.58 million metric tonnes, India is the second largest fish producer from the aquaculture sector. Of the 2.414 million hactor of potential aquaculture area available in the country, only 65-70% is being used for fish production at present which indicates further scope of expansion of the aquaculture area. Grow-out fish production technologies have been developed to utilize almost all type of water bodies for culture of appropriate fish species. Backed with seven decades of research and strong biodiversity of fish fauna, aquaculture diversification is on the anvil in the country. These also support strong backup to increase the unit area productivity in the ponds (vertical increase in productivity).

1.1.4 Employment Opportunities in Aquaculture Worker Sector

Freshwater fish farming is an upcoming enterprise in the agriculture and allied sector. It is considered one among the most profit making avenues of farming. With a consistent annual growth of above 6% during last few years, the sector is all set to grow further with expansion of the culture area as well as intensification of the farming intensity. Since availability of skilled personnel is the precursor for growth of any sector, more and more trained personnel would be required in the aquaculture sector to cater the man power demand of the expanding culture area as well as the intensified farming operation.

Tips

Do you need a university degree in zoology or ichthyology to become a successful fish farmer?

No, a good practical ability is more important, although a basic understanding of and 'feel' for animal husbandry is essential. If you have no 'feel' for animals, do not become a fish farmer.

Who is an aquaculture worker?

Think about this. Who do you think is responsible for attending the daily routine works of a fish farm such as feeding the fish, exchanging water, applying lime, manures and fertilizers, cleaning the pond area including the dyke, applying chemicals and therapeutics, sampling fish to check the growth? Well, it is the aquaculture worker! It is his/her duty to create a growing environment for the fish and maintain the asthetic condition of the farm.

Notes



A large rectangular area enclosed by an orange border, containing 28 horizontal lines for writing notes.

UNIT 1.2: Fish Farming

Unit Objectives

At the end of this unit, you will be able to:

- Basic information on the freshwater fish farming operations in the freshwater fish culture.
- Drawing water and treat it for use in the fish farm.
- Use lime to correct pH of soil and water.
- Applying organic manure and inorganic fertilizers.
- Identify aquatic weed and apply appropriate methods to eradicate.
- Apply pesticide to eradicate predatory and weed fishes.
- Control aquatic insects in pond prior to seed release.
- Manage nursery, rearing and grow-out ponds prior to seed stocking.

1.2.1 Fish Farming

Farming of fish in the freshwater sector refers to raise the whole life stages of the fish in confinement which includes seed rearing and the grow-out farming. Seed are being produced in the hatchery and further transferred to the seed rearing facility. The technique of seed rearing varies from species to species. For example, carp seeds are generally raised in outdoor concrete or earthen rearing tanks in two phases, i.e. nursery phase to rear the spawn to fry stage (25 mm) and rearing phase to raise the fry to fingerling size (60-100 mm). Seed of catfishes and freshwater prawn are initially reared in indoor tanks followed by outdoor rearing mostly in the tank system. The grow-out farming is carried out to raise the fish seed to marketable size. Both seed rearing and the grow-out culture of fish are carried out with certain principle of farming.

1.2.2 Equipment and Material Needed



Rubber gloves



Protective footwear



Soft-bristled Handbrush



Aquaculture suit



Sickle, Hand held grass cutter



Spades



Water pumps



Weighing balance



Lawn mower



Small boat for feeding



Aerator



Aluminium bucket/mug



Hapa



Drag net

Fig 1.2.2 Types of equipment and material used in fish farming



Water Pump



Weed Cutter



Weed Raker

Fig 1.2.2 Tools and Equipments

1.2.3 Organizational set up of a Fish Farm

A farm is the basic infrastructure required for fish farming, be it for raising seed or the grow-out fish or a combination of both. The farm should have a basic organizational structure to run the fish culture activity smoothly on a day to day basis. Following figure represents a schematic diagram of the organizational structure of a fish farm. The number of personnel in each level depends on the farm area and the dimension of farming operation.

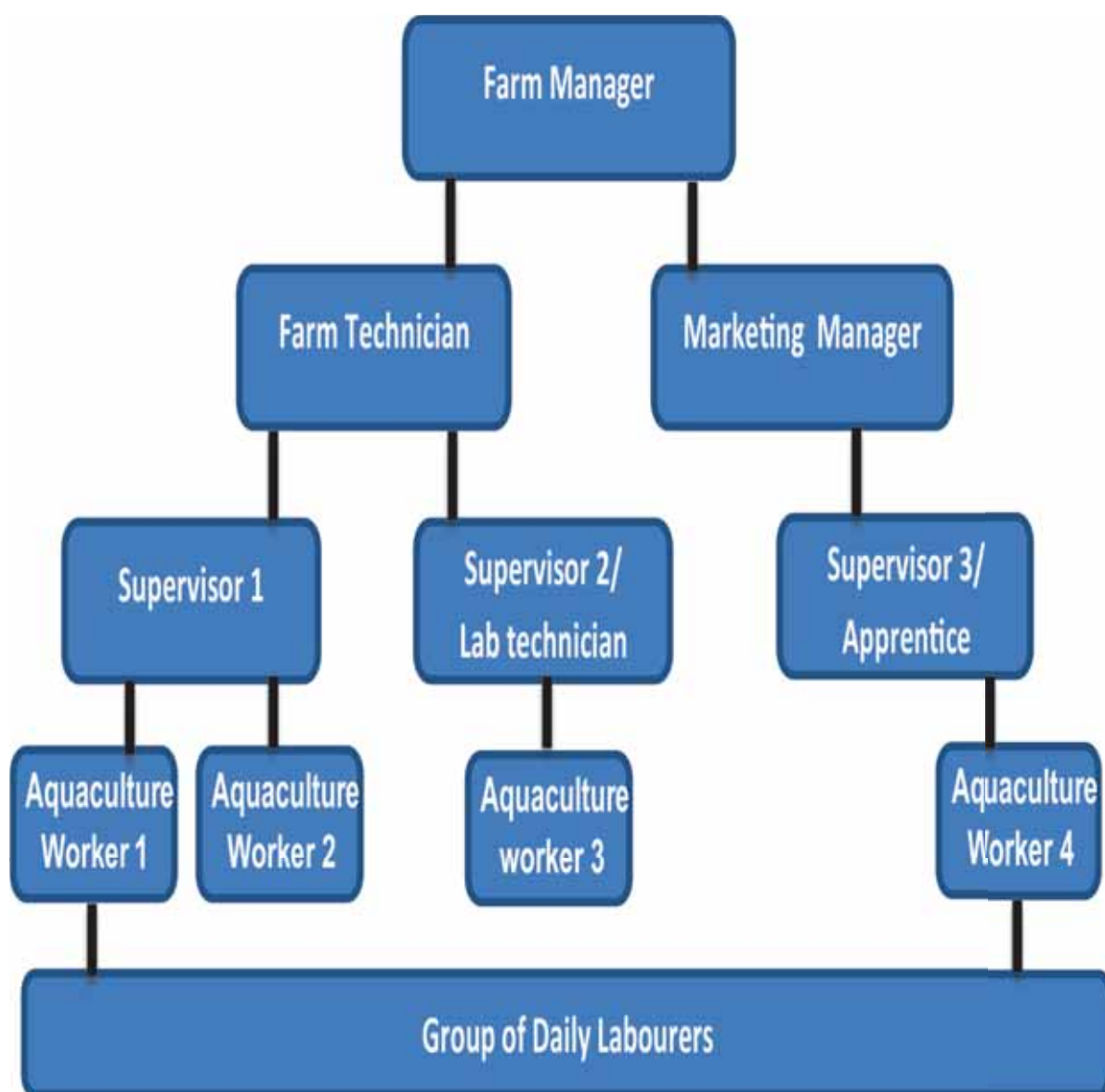


Fig 1.2.2 Hierarchy system

