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Facilitator Guide

Sector
Agriculture

Sub-Sector
Fisheries

Occupation
Aquaculture

Reference ID: **AGR/Q4904,** Version **3.0**
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Aquaculture Worker

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

Shri Narendra Modi
Prime Minister of India

Acknowledgements

We are thankful to all organizations and individuals who have helped us in preparation of this Facilitator Guide. 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 Facilitator Guide 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 for the content and helping us in preparation of this Facilitator Guide.

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 Guide

This Trainer guide is intended to empower the trainer/facilitator to prepare the participant to become 'Aquaculture Worker' as per the Qualification Pack (QP).

The objective of the guide is to provide an approach map for interacting with the trainees undergoing training on the job role. The aim of the course is to provide both theoretical and practical knowledge to the trainees, and also to guide them.

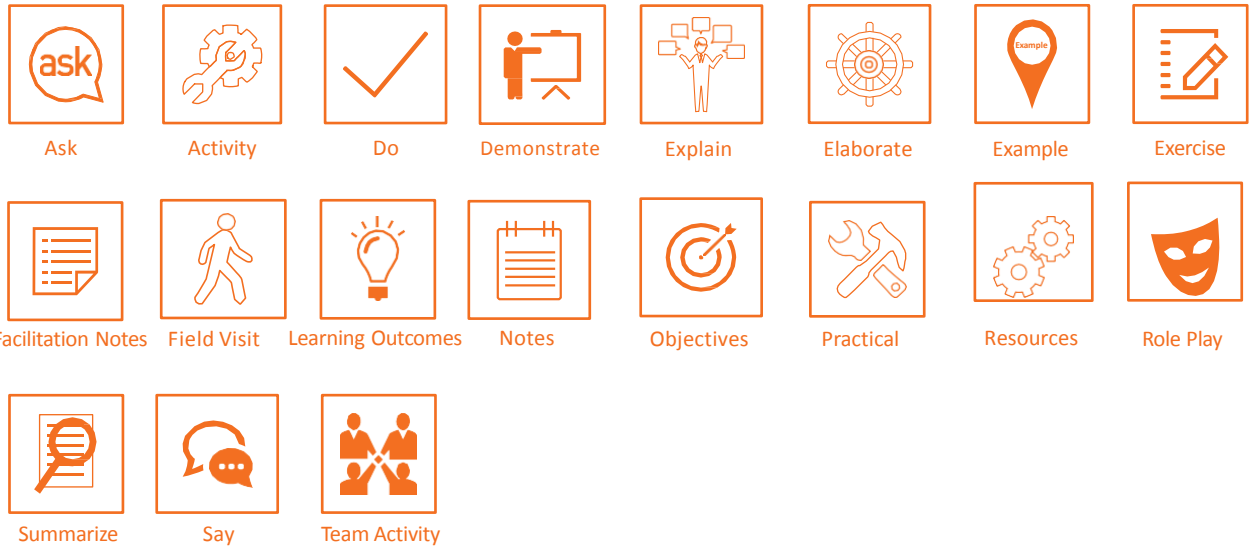
The guide is neither a substitute nor complete road map, but an aid to help you to pass on the knowledge on all the aspects to the trainees in a systematic manner. It is expected that the trainer is fully conversant with all the contents of the handbook. The guide is just to indicate that how to proceed for covering a topic and includes some additional information that may be necessary for the trainer to develop better comprehension.

Facilitator with the help of this guide will be able to build among participants:

- **Knowledge and Understanding:** Satisfactory operational learning and comprehension to play out the required chore
- **Performance Criteria:** Pick up the required aptitudes through hands on preparing and play out the required operations inside the predetermined measures
- **Professional Skills:** Capacity to settle on operational choices relating to the zone of work

The guide will also help them learn more by field visits and providing hands on training. It is expected that irrespective of the region, knowledge on all aspects of Aquaculture Worker farming will be imparted to trainees.

Symbols Used



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1. Introduction to the Role of An Aquaculture Worker

Unit 1.1 - Fresh Water Aquaculture Sector in India

Unit 1.2 - Fish Farming

Unit 1.3 - Job Role of An Aquaculture Worker

Bridge Module

Key Learning Outcomes

After the completion of this module, the participant will be able to:

1. Describe the size and scope of the Agriculture industry and its sub-sectors.
2. Discuss the role and responsibilities of an Aquaculture Worker.
3. Identify various employment opportunities for an Aquaculture Worker.

UNIT 1.1: Freshwater Aquaculture Sector in India

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Explain the freshwater pond resources of the country
2. Explain importance of aquaculture in supplying fish protein
3. Explain organizational structure of a fish farm
4. Explain employment opportunity available in the aquaculture sector

Resources to be Used

- Available objects such as a white board, duster etc.
- Power point slides, Pictures / posters e.g. that can depict various role of Aquaculture.
- Assignments included in participants' manual.
- Video film to show capture and culture of fishes in brackish water and marine water bodies.
- Teaching aids such as posters and charts to depict freshwater resources of India
- Smart class room equipped with Projector and laptop, etc.,

Say

- Welcome the participants and thanks everyone for their participation in this training program.

Ask

- How many of you have visited sea shore, river, lakes etc.
- Is there any difference in the water of sea & river?
- Name few rivers of the country.
- Name some states where you find sea shore.

Explain

- Introduce participants to definition of Aquaculture and explain the Aquaculture equation as mentioned in participant manual.
- Explain different categories of Aquatic animals and poultry with examples and pictures. Explain their role in livelihood, human health and nutrition.
- Explain various groups of Aquatic animals (e.g. fish, crustaceans, Molluscs, aquatic plants, algae, and other aquatic organisms).

Elaborate

- Fresh water sector
- Importance of fresh water sector
- Present status of fresh water sector in the country
- Employment opportunitiies in Aquaculture worker sector

Team Activity

Purpose: Knowledge enhancement, effective communication.

Methodology: Group discussion and stage presentation for about 20- 30 minutes.

Expected outcome:

- Confidence building
- Group involvement
- Knowledge enhancement

Divide the participants into groups and ask them to discuss among themselves on the topic that has been taught in the class. Now call one volunteer from each group and ask him to summarize the topic and appreciate everyone.

Say

- Thank everyone for their participation.

Notes for Facilitation

- Help participants to complete all the tasks included in the participant manual.
- A thorough understanding of the meaning of Aquaculture will help in inculcating serving attitudes and create awareness of 'people' dimensions associated with Pond care and development.
- While describing the role and importance of Aquaculture help participants to develop a sense of pride amongst themselves as would-be service providers of a sector that is important to country's economy, social and cultural well-being.

Exercise

Key Solutions to PHB Exercises

1. Aquaculture continues to increase in volume and value of output in many countries of the world, filling the gap between the supply and demand for fish and fishery products, improving nutrition, and contributing to the household economy, particularly in rural areas. Refer unit 1.1.
2. Aquaculture workers breed and raise fish and cultivate mussels, oysters and other forms of aquatic life, for sale or delivery on a regular basis to wholesale buyers, marketing organizations or at markets.

UNIT 1.2: Fish Farming

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Explain basic information on freshwater fish farming operations in freshwater fish culture
2. Draw water and treat it for use in the fish farm
3. Use lime to correct pH of soil and water
4. Apply organic manure and inorganic fertilizers
5. Identify aquaculture weed and apply appropriate methods to eradicate
6. Apply pesticide to eradicate predatory and weed fishes
7. Control aquaculture insects in pond prior to seed release
8. Manage nursery, rearing and grow-outponds prior to seed stocking

Resources to be Used

- Available objects such as a white board, duster, flip chart board / paper etc.
- Assignments / class work included in participants' manual.
- Equipment, raw material nets etc. used in fish culture i.e. pre-stoking, stocking and post-stocking (refer participant hand book of aquaculture worker).
- Models of hatchery and nets (nursery net, hand net, plankton net, cast net and gill net)
- Specimens of cultivable fishes, fish seed (fry, fingerlings), eggs (fertilized and unfertilized eggs).

Say

- Greet the participants and recall the previous session learning outcomes.

Ask

- Who will explain the difference between agriculture farming and fish farming?
- How many of you eat fishes. Do you know their names?
- Who has seen a fish farm?

Explain

- Explain importance of fish farming.
- Enlist fishes which are used in farming to meet the market demand for table fish
- Explain nutritional value of fish.

Elaborate

- With the help of PHB and audio visual aids, elaborate:
- Fish farming
- Equipment and material needed
- Organisational set-up of a fish farm

Activity

Purpose: To acquaint about the equipments . This activity may be planned for 15-20 minutes.

Methodology : Group discussion

- Divide students into 2 or 3 groups.
- Ask them to do activities given in participant manual like specifying each equipment name and its purpose.
- Taking clue from the equipment, groups should discuss amongst themselves the functioning of each equipment.
- Each participant should memorize the equipment

Say

- Thank everyone for their participation.
- Describe the objective of all the above activities.
- Review presentation of each group and add your comment with additional information / corrections – etc.

Do

- Take trainees to the workshop to show models, nets and other equipment used at the fish farm.
- Show model of hatchery, explain its components, use and operation.
- Start the discussion in the class after getting answers from students about fishes, farming, agriculture, etc.

Notes for Facilitation

- Help the participants to complete all the exercises mentioned in the participant handbook.
- Encourage participants of group discussion to ask questions so that they can clear their doubts.
- Trainees may record and understand the setup, role and responsibilities of workers, supervisors, managers etc. appointed to take up fish cultures operation.

Exercise

Key Solutions to PHB Exercises

1. Equipments for Aquaculture:

   (a) Rubber gloves (b) Aquaculture suit (c) Water pumps (d) Aerator (e) Small boat for feeding, etc. Refer section 1.2.2.

2. Freshwater aquaculture refers to raising and breeding aquatic animals (fish, shrimp, crab, shellfish, etc.) and plants for economic purposes by the use of ponds, reservoirs, lakes, rivers, and other inland waterways (including brackish water), which play an important role in the aquaculture industry.

UNIT 1.3: Job Role of an Aquaculture Worker

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Explain his roles and responsibilities on farm

Resources to be Used

- Video films of fish farm operation for fish farming.
- Slides in power point presentation showing specific creative images showing every small activity
- Teaching learning materials i.e. teaching aid and reference materials about fish farm operation to take stock of human resource requirement and duties of different personnel at various levels of operation.

Say

- Greet the participants and revise the key learnings of previous session discussion.

Elaborate

- Job role of an aquaculture worker

Team Activity

Purpose : To recall the topic. This may be plan for 30-40 minutes.

Methodology : Group Discussion

Procedure

- Divide the class into three teams.
- Give sufficient time for teams to refer to the text in participant handbook related to roles of Aquaculture Worker.
- Facilitate team members to discuss amongst them.
- After this, each team will take their turn and sit in circle for a discussion on any one from amongst the topics.
- Ensure that the other teams listen to any particular discussion and note down key points.
- No team should choose the same topic.
- At the end of three rounds of discussion ask each team to suggest other teams' pointers that they may have missed while discussing on their chosen topic.
- The group making maximum suggestions to others should be awarded with appreciation.

Say

- Sum up the key learning of above group discussion topics and relate it to the role and responsibility of Aquaculture Worker.
- Please describe the Assessment criteria of the job role by explaining the Principal components under each NOS as per the qualification pack.

Do

- Show or discuss the operation of nets and sailing of a boat.
- Enlist persons at a fish farm assigned different duties. However, these days' multi skilled persons are given preference.
- Organize group Activity to show case different activities at a fish farm under taken by scientists, supervisors, and field assistants.
- Make an organizational plan of a fish farm and depict different activities and cadre of people or multi skilled persons handling various farm activities

Notes for Facilitation

- Encourage participants of group discussion to ask questions so that they can clear their doubts (if any) on future job role.
- Assist participants to streamline their thought process while discussing the above question. E.g. Preventive service is good because it is less costly; animals retain their productivity etc.
- You can invite representative of any organization who employs Aquaculture Worker to speak on 'expectations from trainees'.
- Indicate briefly the option for career progression and career mobility of Aquaculture Worker completing training under NSQF framework e.g. an Aquaculture Worker can further study to become Aquaculture Technician. He /she can work anywhere in India or even seek employment outside the country.

Exercise

Key Solutions to PHB Exercises

1. Andhra Pradesh- highest demand for Pulasa fish.

   Tamil Nadu

   Kerala- Almost 905 species of fish are found in the inland & marine waters of Kerala.
2. Marine Invertebrate Research Hatchery Manager, Hatchery Manager, Aquaculture Extension Specialist, etc .

Notes

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2. Assistance in Culture Unit Preparation Activities

Unit 2.1 - Drawing and Storage of Water

Unit 2.2 - Water Treatment

Unit 2.3 - Apply Organic Manure

Unit 2.4 - Eradicate Predatory and Weed Fish

Unit 2.5 - Pond Fertilization

Unit 2.6 - Aquatic Insects Control and Treatment

AGR/N4919

Key Learning Outcomes

After the completion of this module, the participant will be able to:

1. Explain various pre-stocking and pond preparation activities carried out in freshwater aquaculture system.
2. Explain the importance of using appropriate fertilizers/manures for the optimum growth of plankton.
3. State the consequences of improper usage of chemicals.
4. Describe various water treatment methods/ processes.
5. Explain the importance of optimum and sustainable utilisation of water resources.
6. Describe the process of drawing water from the source to fill the reservoir.
7. Describe the process for pumping treated water into the culture pond from the reservoir after treatment.
8. Explain the importance of recycling and disposing of different types of waste as per the applicable regulatory requirements.

UNIT 2.1: Drawing and Storage of Water

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Explain the importance of water storage
2. Undertake water storage

Resources to be Used

- Power point slides, Pictures / videos /posters /.g. that depict various of water storage
- Pictures of local fish farm to demonstrate/locate nearby water resources to draw water in the farm for storage.
- Model of fish farm showing drawing and storage of water, with details of network of pipelines.
- Pictures of local fish farm to demonstrate/locate nearby water resources to draw water in the farm for storage

Say

- Good day and welcome all the participants to the training session. Recall the key points of previous session discussion.

Elaborate

- Elaborate the following topics with the help of participant handbook, audio visual aids etc.
  - ✓ Drawing and Storage of water
  - ✓ Pre-stocking and pond preparation activities in freshwater aquaculture system

Ask

- Ask participants to go through the participant handbook.
- Ask participants if they can demonstrate the water pumping into the pond.

Demonstrate

- Demonstrate various parts of water pump.
- Show various types and samples of water.

Explain

- Importance of water storage and give a short introduction to next chapter by stressing the importance of water treatment.

Activity

Production : To perceive the given topic . Time may be plan for 20-30 minutes.

Methodology : Pen and Paper activity

- Make groups of 2 or 3 students .
- Ask participate to write the points involved in management of pre-stocking pond.
- Address any queries of the participants.
- At the end of the activity students able to manage the pond.

Notes for Facilitation

- Give assignment to participants to collect water samples from different sources of water such as canals, river, lake, reservoirs and ponds of fish farm. Compare water quality parameter such as DO, NO2, NO3, phosphates, pH, turbidity, total dissolved solids, etc. Mark the parameters suitable for fish culture and mention the water body sampled.
- Organize practical sessions for water analysis for hands on experience.
- Trainees may be guided to make a layout plan for inlet and outlets at the farm from drawing water and expelling water during flooding.

Exercise

Key Solutions to PHB Exercises

1. The pre-stocking pond management of drainable ponds, which can be dried, is as follows.
   Draining and drying, Ploughing, Liming, Filling with water and fertilization, etc. Refer section 2.1.2.
2. It reduces soil erosion and flood hazards by collecting rainwater and reducing the flow of storm water to prevent urban flooding.

UNIT 2.2: Water Treatment

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Apply chlorine for water treatment
2. Apply lime for correcting pH
3. Explain about turbidity and pH

Resources to be Used

- Available objects such as a white board, duster etc.
- Slides in power point presentation showing specific images (Refer participant manual for images)
- Chlorine and Bleaching powder.

Explain

- Explain the process to control Turbidity in the reservoir.
- Clearly explain the steps of Lime preparation.

Elaborate

- Water treatment
- How to control turbidity ?
- Chlorination to treat water
- pH Correction
- Steps to apply lime
- Pump the treated water to culture ponds from the reservoir

Demonstrate

- Demonstrate testing of pH of the water sample by using pH strip.
- Measure turbidity to show the trainees and why it is harmful?
- Demonstrate the method of using hydrated lime and gypsum to reduce turbidity.
- Demonstrate and calculate the dose of cow dung to control clay, turbidity.
- Demonstrate process of chlorination of water

Activity

Purpose : To acquaint students about Pump the treated water to culture ponds from the reservoir

Materials required: Pen/Pencil, Notebook, Checklist.

Procedure:

- Ask the participants to make a list of different steps involved in this process
- All the participants submit their sheet to the teacher.
- Ask any one of the participants to write the points on white board
- Then the teacher will discuss those points with the participants and clarify their doubts.

Say

- Wasn't the activity brainstorming? I hope you all like it.
- Thankyou everyone for their participation
- Discuss responses of the participants regarding the discussion.

Notes for Facilitation

- Guide participants to collect samples of water and undertake test for pH, dissolved oxygen and pathogens. Make notes as whether or not the water is suitable for fish culture.

Exercise

Key Solutions to PHB Exercises

1. 4-5 days
2. yes, after proper treatment of water , water can be used for farming

UNIT 2.3: Apply Organic Manure

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Explain when to use organic manures
2. Explain benefits of using organic fertilizers in the pond

Resources to be Used

- Cow dung
- Containers such as buckets, small cement or iron tanks for making slurry.
- Gloves

Ask

- Who will tell, what is organic manure?
- How it is made?

Elaborate

- Apply organic manure if required

Notes for Facilitation

- Assist all groups to understand the topic clearly through visualization.
- Encourage the participants to maintain their own records.
- Keep some exercises handy for the activity.
- Constantly motivate each student to participate.
- Address the queries of the participants and clear all the doubts participants.
- Trainees should be given practical to make slurry of cow dung and administer in fish pond.
- Observe trainees for self-hygiene and use of safety measure.

Exercise

Key Solutions to PHB Exercises

1. Manures are the organic materials derived from animal, human and plant residues which contain plant nutrients in complex organic forms.
2. Cow dung is applied @12-15 ton/ha/year. The basal manuring is done at 3-5 ton/ha depending on the richness of organic matter in the pond bottom.

UNIT 2.4: Eradicate Predatory and Weed Fish

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Identify the common predatory and weed fish
2. Explain the methods to eradicate predatory and weed fish

Resources to be Used

- Live specimens of weed and predatory fishes in local areas.
- Equipment required for removal of weed and predatory fishes, such as hooks, lines and nets, measures, weighing machines, buckets etc.
- Raw materials and chemicals as per method to be used such as mahua oil cake, tea seed cake derris, bleaching powder, urea and anhydrous ammonia.
- Video film on operation of removal of weed and predatory fishes.
- Teaching aids such as charts & posters showing different weed fishes, predatory fishes, equipment's etc.
- Illustrations of operations involved.

Say

- Greet the participants and revise the key learnings of previous session discussion.

Ask

- What do you know about predatory and weeds fishes?
- What harm is expected by the presence of predatory & weed fishes in the pond.
- Name a predatory and a weed fish
- Should any chemical be used to eradicate these fishes? If not then what alternative method can be used.

Explain

- Eradicate predatory and weed fish using various methods

Team Activity

Purpose : To perceive the topics . The tentative time will be 1 hour.

Methodology : Quiz

Procedure :

- Divide the class into two groups.
- In turns ask the quiz questions to the groups.
- If the answer is incorrect pass the questions to other group.
- Share the answer if the groups are not able to answer.
- Congratulate the participants who answered correctly.

Do

- Encourage the students to actively participate in the activity.
- Encourage the non-participants to open up and speak up.
- Share your own thoughts and viewpoints related to the topic.

Notes for Facilitation

- Undertake those activities of removal of these fishes repeatedly which trainees are expected to undertake as assistant.
- Organize visit to fish farm and local water bodies along with fishermen to catch fishes. Then the catch may be analyzed for various economically important fishes, weed fishes and predatory fishes.
- Engage trainees in various chemical and biological control operations used for eradicating these fishes.
- Organize frequent demo of various operations and preserving predatory and weed fishes.
- Equip the laboratory with equipment, raw materials, chemicals and specimen of predatory and weed fishes.

Exercise

Key Solutions to PHB Exercises

1. Predatory fish are hyper carnivorous fish that actively prey upon other fish or aquatic animals and the weed fish compete with carp for food, space and oxygen. Refer unit 2.4 in PHB.
2. Control methods are Drying/ Hooks and line/ Neng, Mahua oil cake (saponin), Tea seed cake (saponin), etc.

UNIT 2.5: Pond Fertilization

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Explain the need and time of pond fertilization
2. Know the types of inorganic fertilizers used in aquaculture

Resources to be Used

- Teaching aids to show case principles of pond fertilization
- Acquaintance with inorganic fertilizers used in pond fertilization
- Samples of oil cakes of ground nut and mahua and superphosphate.
- Illustration to show doses and method of application of inorganic fertilizers.
- Plankton nets
- Buckets
- Mugs

Ask

- Can any one of you tell difference between fertilization used in an agriculture crop field and fish pond.
- Who will tell what fertilizer is and what is its use in our agriculture field or fish pond.

Elaborate

- Fertilize the pond with inorganic fertilizer to get desired plankton growth.

Notes for Facilitation

- Participants may be asked to collect information on types of oil cakes give more growth of phytoplankton.
- Set up an experiment to show the efficiency of different oil cakes.
- Organize visit to a fish farm to actually see the application of fertilizers and growth of plankton in rearing and grow out ponds.
- Trainees should be guided to maintain a record of administering manure and fertilizers with respect to time, dose and growth of plankton and fish seeds

Exercise

Key Solutions to PHB Exercises

1. By increasing the availability of major nutrients, fertilizers promote the development of planktonic algae, which provide food for many fish .

UNIT 2.6: Aquatic Insects Control and Treatment

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Prevention of water insects before starting fish farming
2. Know the types of inorganic fertilizers used in aquaculture

Resources to be Used

- Specimen of aquatic insects
- Chart posters of illustration of aquatic insect and netting operation
- Drag net
- Kerosene oil
- Buckets
- Soap oil

Ask

- Can anyone tell that why aquatic insects should be removed from nursery and rearing pond.
- Do you think that these insects can be netted out or not? If not then what safe method of without using chemicals they can be removed.

Elaborate

- How to control aquatic insects prior to seed stocking.

Team Activity

Purpose: Knowledge enhancement, effective communication.

Methodology: Group discussion and stage presentation for about 20- 30 minutes.

Expected outcome:

- Confidence building
- Group involvement
- Knowledge enhancement

Divide the participants into groups and ask them to discuss among themselves on the topic that has been taught in the class. Now call one volunteer from each group and ask him to summarize the topic and appreciate everyone.

Say

- Thank everyone for their participation.
- Describe the objective of above activity.
- Review the presentation of each group and enrich the same with your comments/valuable information/corrections etc.

Notes for Facilitation

- Organize visit to show actual operation of drag net and method of eradicating aquatic insects
- Prepare teaching aids such as collage, posters etc. to show aquatic insects and method of their control
- Video film may also be used to show operation of drag net to catch insects.
- Trainees may be asked to collect aquatic insects by hand nets,
- Trainees should preserve and arrange specimen in the laboratory with proper labeling.
- Trainees should be given schedule of stocking of fish seeds so that they may plan to remove aquatic insects from the ponds

Exercise

Key Solutions to PHB Exercises

1. The different methods followed for insect control in nursery ponds are as follows.
   - 1 day before stocking- Soap –oil- Vegetable oil (56 l) + Soap (18 kg) per hectare, etc. For more refer section 2.6.1.
2. An agricultural inorganic fertilizer may contain several types of nutrients: primary nutrients: nitrogen (N), phosphorus (P) and potassium (K), etc. For more details refer unit 2.6.

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3. Assistance in Stocking, Post Stocking, Harvesting and Post-Harvest Processing

Unit 3.1 - Sampling and Netting Operation

Unit 3.2 - Supplementary Feeding

Unit 3.3 - Manures and Fertilizers

Unit 3.4 - Aeration and Water Replenishment

Unit 3.5 - Periodic Checking

Unit 3.6 - Harvesting

Unit 3.7 - Eradicate Aquatic Weeds

Unit 3.8 - Stocking

AGR/N4920

Key Learning Outcomes

After the completion of this module, the participant will be able to:

1. Describe the standard procedure for acclimatisation of seeds.
2. Explain the process and techniques for seed stocking.
3. List various activities involved in post-stocking culture operations.
4. Describe the netting process for removing unwanted and harmful organisms from the pond.
5. Explain the standard procedure for feeding supplementary feed to fish.
6. Describe the process of split feeding.
7. Explain how to detect abnormal behaviour patterns, lesions and parasites in the fish.
8. Explain the procedure for periodic soil, water, and fish sampling.
9. State various practices for feeding and rearing fish to harvestable size.
10. Describe the process of partial harvesting.
11. State the guidelines for handling fish between harvest and transportation.
12. Describe the appropriate method of packing the harvested fish.
13. State different feed types and routines for feeding different species.
14. State various safety and hygiene protocols to be followed during stocking and post-stocking operations.
15. Explain various practices for harvesting and post-harvest care of the fish produce.
16. Describe the process of applying lime, manure and fertilizers.
17. Explain the use of aerator pumps to maintain the required level of dissolved oxygen in the pond water.
18. Explain the importance of inclusion of all genders and People with Disability (PwD) at the workplace.
19. Explain the benefits of resource optimisation.

UNIT 3.1: Sampling and Netting Operation

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Know the right time of sampling
2. Know the method of sampling
3. Identify different nets used for different types of sampling
4. Recognize the different types of aquatic weeds

Resources to be Used

- Available objects such as a participant handbook, white board, duster, flip chart board/paper etc.
- Slides in power point presentation showing relevant images.
- Samples of soil, water and record of fish growth every fortnight
- Nets for fish samples of appropriate mesh size.
- Core sampler, Polythene bags, Water sampling bottles
- Permanent marker pen for numbering and labeling the water sample bottles and soil sample bags regarding data, location and collected by.
- Tray or racks for keeping soil and water sample bags and bottles.

Say

- Greet the participants and recall the previous session learning outcomes.

Elaborate

- Carry out periodic soil water and fish sampling and netting operation
- Gender neutral behaviour

Activity

Purpose : Knowledge enhancement . Time may be plan for 20-30 minutes.

Methodology : Pen and Paper activity

- Ask each participants to write down soil sampling, water sampling, fish sampling.
- Ask 4-5 participants to stand randomly and share the findings among their peers.

Demonstrate

- Soil sampling method using core sampler
- Model record sheet to be maintained by Aquaculture Workers for inspection of his / her supervisor.
- Mobile devices and process of reading sampling, data entry and transmission

Practical

- Assist participants to do netting and take record.
- Assist participants to practice use of mobile devices or work sheet for data collection.

Notes for Facilitation

- Teaching aids should be prepared such as charts and tables for soil & water quality desirable parameters
- Organize visit to nearby fish farm to see netting of fishes to check their growth and diseases, soil and water sampling operations.
- Table must be put in the laboratory regarding symptoms, treatment and control of fish diseases.
- Model fishing nets and samplers for soil and water must be put in the lab.
- Guidance must be provided to trainees with respect to procurement of soil water analysis reagents, glass ware, chemical kits etc.
- Assignment may be given to trainees to collect samples of water and soil.
- Trainees may be asked to compile information on occurrence of fish diseases in nearby pond fishes. The observations may include symptoms, prevention, control and treatment.

Exercise

Key Solutions to PHB Exercises

1. Nets for fish samples , Core sampler, Polythene bags, Water sampling bottles, Tray or racks , etc.

UNIT 3.2: Supplementary Feeding

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Know the feed requirements of fish at different stages
2. Know the different feeding methods

Resources to be Used

- Supplementary feed, ground nut and mustard oil cake and rice bran, formulated feed.
- Feeding trays, bags or other feed broadcasters.
- Teaching aid for tubular presentation of preparation, application and doses or quantity of feed to be broadcasted.
- Video film to show preparation and broad casting of feed.

Say

- Greet the participants and revise the key learnings of previous session discussion.

Elaborate

- Supplement dietary supplements at the right time and place and in the right amount as prescribed by the technician
- Follow the instructions of the technician for feeding by spraying, if any

Role Play

- Request few volunteers to enact a scene of history taking in village setting with following role play e.g. complaining farmer, Aquaculture Worker (lead role), ailing fish, other healthy fish, technician and neighbors. Place some noticeable things within the environment e.g. few cans of pesticide in one corner of the farm.
- (At the end of the play, comment on observed positive and negative points, re-emphasize the need of careful listening of complain, creature approach, looking into detail of environment etc.)

Notes for Facilitation

- Trainer must organize the visit to a fish farm to give demonstration and exposure to real situation of post stocking operation, specially feeding of fish seeds.
- Teaching aids i.e. tabular presentation of feeding schedule and quantity of feed.
- Participation of trainees must be encouraged specially in fish sampling for estimating quantity of feed, in administrating feed in bags and broadcasting in nursery pond. Also an exposure must also be given for procurement of feed ingredients.

Exercise

Key Solutions to PHB Exercises

1. Fish can be grouped into four main categories, according to the type of food which they prefer under natural conditions. Refer unit 3.2.
2. Most fish farmers use complete diets, typically made up of the following components and percentage ranges: protein, 18-50 percent; lipids, 10-25 percent; carbohydrate, 15-20 percent; ash, <8.5 percent; phosphorus, <1.5 percent; water, <10 percent; and trace amounts of vitamins and minerals.

UNIT 3.3: Manure and Fertilizers

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Apply different types of minerals used in aquaculture

Resources to be Used

- Teaching learning materials with illustration of pond measurement to calculate water volume and dose of manure and inorganic fertilizers
- Video film to show application of lime, manure and fertilizers
- practical's may be organized at the fish farm

Say

- Greet the participants and revise the key learnings of previous session discussion.

Elaborate

- Application of manures, fertilizers and treatments as recommended by the technician
- Sprinkle lime in the pond, slope from time to time

Ask

- Amongst trainees who will explain difference between manure, fertilizers and therapeutics
- Why there is need to apply lime, manure, fertilizers, therapeutics in fish pond.

Practical

- Assist participants to show how to apply lime based on the slope of pond.

Do

- Measure the depth of water, calculate water volume and then calculate quantity of fertilizers /manure to be applied in the fish pond.
- Demonstrate application of manure, lime and fertilizers.
- Organize visit to a farm to observe steps for application of manure and fertilizers in the fish pond.
- Apply lime in the pond as per need.

Notes for Facilitation

- It is suggested that this unit may be taught at the fish farm along with practical of calculation of doses as per water volume, application of fertilizers, manure and lime
- Model of a pond may be used to show calculation of water volume.

Exercise

Key Solutions to PHB Exercises

1. Soil acidity can be corrected easily by liming the soil, or adding basic materials to neutralize the acid present. Alkaline soils are neutralized with the addition of elemental sulfur, iron sulfate or aluminum sulfate.

UNIT 3.4: Aeration and Water Replenishment

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Know the methods of aeration of water
2. Know the right quantity of water to be replenish and when

Resources to be Used

- Basic model of aerators
- Illustration of different types of aerators or air diffusers, inlet structure and filtration system
- Practical's may be organized at the fish farm

Say

- Greet the participants and revise the key learnings of previous session discussion.

Elaborate

- Ensure proper aeration and water replenishment in the culture pond

Activity

Purpose: To acquaint about proper aeration and water replenishment. This activity may be planned for 15-20 minutes.

Methodology : Pen and per activity

- Ask the participants to list out factors to ensure proper replenishment in the culture pond.
- Ask any one of the participants to pin point the factors on white board.
- Ask the other participants to discuss amongst themselves and ask any queries realised to the topic.

Ask

- What is an aerator and its function in a fish pond
- Where and why aerator is used.
- In which circumstances water replenishment is done in the pond.
- What if water has been exchanged still aerator will be needed.
- Tell something about emergency situation when water exchange and/or replenishment is required.

Notes for Facilitation

- Organization of visit to a fish farm or establishing linkage with a fish farm
- Prepare or procure teaching learning materials for an understanding of structure of aerator and its installation in the fish pond, to acquaint trainees with working principle of aerator, air diffusion, water replenishment and water depth in the pond, dyke height, etc.
- A farm technician may also be invited to take these sessions
- Provide opportunity for hands on experience at the fish farm

Exercise

Key Solutions to PHB Exercises

1. More than four aerators. Refer unit 3.4.

UNIT 3.5: Periodic Checking

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Explain the importance of periodic checkups in aquaculture
2. Undertake appropriate action if any abnormality is found

Resources to be Used

- Specimens of fishes with indicators of disease such as fishes having lesions, red patches, etc.
- Video film to show abnormal behavior or developing lesion/red patches as indicators of different fish diseases.
- Teaching aids such as charts or collages showing symptoms of diseases, their control, treatment and prophylactic measures, if any.
- Nets and gears, farm implements such as brush, cutter, sickle, spade, pipes, aerator, sampling containers & nets, feed bag.

Elaborate

- Note unusual behavior, if any, in the pond or presence of parasites, lesions on body, etc. and report it to the technician
- Take care of farm implements, nets and gears, cleaning of pond, dyke and slope, periodic pond activity, etc.
- Remove dead and Moriband fish from the pond

Field Visit

Purpose: To perceive the knowledge about periodic checking.

Methodology: Field visit and the time varies according to the location, it may be 1-2 hours.

Expected outcome:

- Confidence building
- Knowledge enhancement

Procedure

- Organize a visit of the participants to nearby village with good population of fishes. They should interact with a select group of village elders and farmers to list season wise diseases of pond fishes.
- On return they should visit local outlet and collect any published pictorial disease calendar or atlas of diseases of pond fishes.
- A volunteer should be asked to record and present learning of the class as a whole including that of information in collected publications.

Summarize

- Sum up the session with appreciation for active and patient learning of the participants.

Notes for Facilitation

- Organize visit or establish linkage to fish farm for technical and practical sessions and hands on experience.
- Provide teaching learning materials viz charts, table, to do list, periodic checking schedule, etc.
- Video session for practical and training.

Exercise

Key Solutions to PHB Exercises

1. pond, pump, accessories, aerators, sampling containers, net, feedbag, etc. Refer unit 3.5.

UNIT 3.6: Harvesting

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Explain the desired size of fish in partial harvesting
2. Ensuring minimum handling of fish

Resources to be Used

- Available objects such as a white board, duster etc.
- Slides in power point presentation pictorially explaining harvesting procedures and steps.
- Specimens or live fish of bigger size which is recommended for harvesting.
- Fish catch of mixed sizes to enable understanding and selection of right size of fish.
- Nets & gears for harvesting
- Buckets, jars & beakers to check and select desirable size of fish.

Say

- Greet the participants and revise the key learnings of previous session discussion.

Explain

- What is a partial harvesting?

Elaborate

- How one can involve in minimum handling during harvest till marketing.
- Tips taken during Transportation

Activity

Purpose : To enhance the knowledge about the partial harvesting.

Methodology: Visit a nearby fish farm and observe all the methods.

Tentative time : 1-2 hrs. or it may be depends on the distance of location.

Material required: Checklist, notebook, pen/pencil

Procedure:

- Divide the participants into groups of 2 or 4 and ask them to visit the fish farm with their respective groups.
- See all the parameters that we have learn and write them on your sheet.
- All the group participants will have their own observation and then everyone will discuss in their group.
- All the participants submit their sheet to the teacher.
- Ask any one of the participants to pin point the factors on white board.
- Then the teacher will discuss those points with the participants and clarify their doubts.

Ask

- What do you think how big a fish could be sold in the market as table fish?
- Think about what process will enable selection of desired size of the fish.
- What will happen if you touch fishes harshly and put them in nets in hurry and roughly.

Do

- Organize visit to fish farm to get exposure and hands experience of harvesting of fish.
- Undertake netting of fishes to observe for desirable size.
- Undertake selection of marketable fishes from the catch.
- Demonstrate and give instructions for safe handling of fishes during harvesting
- Demonstrate packing of fishes for market.
- Demonstrate cleanliness, good self hygiene measures, keeping the catch in clean place, maintain hygienic conditions in the boat, and at the landing centre.
- Demonstrate correct method of harvesting using right mesh size, and netting in desired way.

Notes for Facilitation

- Providing opportunity at the fish farm to participate in the netting operation, removing fishes from the net, collect the catch in the boat, safe handling, and self hygiene and safety measures.
- Send trainees to the market to observe various sizes, hygienic conditions, healthy fishes fetching high price and demand /supply of fishes
- Attach trainees to fish farms during harvesting season to obtain hands on experience.
- Engage farm technician to discuss and demonstrate harvesting.

Exercise

Key Solutions to PHB Exercises

1. To reduce the rate of distress in fishes, it is beneficial to handle them as little as pssible. For more refer unit 3.6.

UNIT 3.7: Eradicate the Aquatic Weeds

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Explain the different methods of removing wild weeds from water
2. Identify the tools and uses of various equipment for removing weeds from water
3. Recognize different types of Aquatic weeds

Resources to be Used

- Available objects such as a white board, duster, flip chart board / paper etc.
- Any available video and PowerPoint showing specific weeds.
- Weed samples of a fish pond.
- Teaching aids such as charts / posters showcasing methods of eradication to acquaint trainees with pre- stocking preparations.
- Charts/posters of pictures of various tools and equipment required for eradication of aquatic weeds.
- Laboratory equipped with all equipment used for eradication of weeds.
- Video films on eradication of aquatic weeds
- Stationery items such as pencil, color pens, eraser, drawing papers etc. sketch pens to sketch different weeds equipment viz sickle, rakes, hooks, nets, and ropes used in mechanical /manual methods.

Say

- Greet the participants and revise the key learnings of previous session discussion.

Ask

- Why weeds should be removed from the fish pond.
- Do you think all types of weeds should be removed from the pond?
- If you know aquatic weeds, name a few as per their location of presence in the pond i.e. weeds of the margin, floating ones and emerging from the pond etc.

Activity

Purpose: To acquaint about the chemical and biological methods to control weeds. This activity may be planned for 15-20 minutes.

Methodology : Pen and per activity

- Ask the participants to list out chemical and biological methods.
- Ask any one of the participants to pin point the methods on white board.
- Ask the other participants to discuss amongst themselves and ask any queries realised to the topic.

Summarize

- Sum up the session with appreciation for active and patient learning of the participants.

Notes for Facilitation

- Ask the participants if they require any kind of help.
- Give project to trainees to collect information on the presence of different kinds of weeds in nearby water bodies and fish pond.
- Make a survey to collect information on various methods used by local fish farmers in the vicinity.
- Give an assignment to trainees to collect different kinds of weeds, label them and preserve them as specimen to keep in the laboratory.

Exercise

Key Solutions to PHB Exercises

1. Aquatic weeds are unwanted and undesirable vegetation that reproduce and grow in water.
2. Excessive growths can lead to fish stunting and overpopulation.

UNIT 3.8: Stocking

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Explain different stages of growth and rearing of fish
2. Know the proper amount of fish stocking for different species of fish

Resources to be Used

- Teaching aids viz charts & table showing different stages of fish seeds and stocking ratio respectively.
- Pictures or video of composite fish culture
- Live fish seeds viz. spawn, fry fingerling.
- Beaker, bucket, nursery hapa, at the fish farm
- Raw Materials like paper, pen, color, pencil, eraser, picture of fish seeds and ponds for making collage, charts etc.

Say

- Greet the participants and revise the key learnings of previous session discussion.

Elaborate

With the help of relevant learning materials and PHB, elaborate:

- Storage of seed after acclimatization process and in proper quantity and species ratio
- Seed stocking
- Stocking density
- Post stocking pond management
- Handling of fish
- Packaging
- Post harvest technology in fish

Ask

- Do you know what fish seeds are and how old they are?
- Why there should be certain ratio of different sps. To be stocked.
- Why different varieties of fish seeds are stocked together.
- What is acclimatization?

Demonstrate

- Demonstrate process of taking out fish seeds from hatchery or nursery ponds/rearing pond.
- Demonstrate to check pH and temperature of water of bag & pond.
- Demonstrate the procedure of acclimatization.
- Demonstrate how spawn, fry and fingerlings are released in respective ponds, show step wise procedure of stocking through video film or through collage or poster viz unloading seed bag and keep in the pond under shade, add pond water in the bag, check temperature and pH of packed water, mixing of pond water in the bag, lower the seed bag in the pond and start releasing the fish seeds in the pre-selected pond.

Notes for Facilitation

- Teaching aids should be prepared such as charts and tables for soil & water quality desirable parameters
- Organize visit to nearby fish farm to see netting of fishes to check their growth and diseases, soil and water sampling operations.
- Table must be put in the laboratory regarding symptoms, treatment and control of fish diseases.
- Model fishing nets and samplers for soil and water must be put in the lab.
- Guidance must be provided to trainees with respect to procurement of soil water analysis reagents, glass ware, chemical kits etc.
- Assignment may be given to trainees to collect samples of water and soil.
- Trainees may be asked to compile information on occurrence of fish diseases in nearby pond fishes. The observations may include symptoms, prevention, control and treatment.

Exercise

Key Solutions to PHB Exercises

1. Early morning or late evening
    - At least 10 to 15 minutes after the aquarium light turns on.
    - Early in the morning

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4. Assistance in Maintaining the Water System, Waste Disposal System, Tools and Equipment

Unit 4.1 - Maintaining the Water and Waste Disposal Systems

AGR/N4964

Key Learning Outcomes

After the completion of this module, the participant will be able to:

1. Explain the importance of arranging for an alternative water supply before the repair and maintenance of the water system.
2. Describe the process of cleaning the water pipes and carrying out repair and maintenance of the water system.
3. Explain how to disconnect and reconnect the water supply system before and after maintenance.
4. Explain the use of the relevant repair and maintenance tools, equipment and materials.
5. Describe the process of carrying out repair and maintenance of the waste disposal system, aerator, water pump and other aquaculture equipment.
6. Explain how to replace any faulty equipment.
7. Describe the process of testing the aquaculture equipment for the correct functioning after repair and maintenance.

UNIT 4.1 : Maintaining the Water and Waste Disposal System

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Explain the importance of arranging for an alternative water supply before the repair and maintenance of the water system
2. Describe the process of cleaning the water pipes and carrying out repair and maintenance of the water system.
3. Explain how to disconnect and reconnect the water supply system before and after maintenance.
4. Explain the use of the relevant repair and maintenance tools, equipment and materials.
5. Describe the process of carrying out repair and maintenance of the waste disposal system, aerator, water pump and other aquaculture equipment.
6. Explain how to replace any faulty equipment.
7. Describe the process of testing the aquaculture equipment for the correct functioning after repair and maintenance.

Resources to be Used

- Available objects such as a white board, duster, flip chart board/paper etc.
- Slides in power point presentation showing relevant images.

Say

- Greet the participants and appreciate the participants for their participation. Before beginning the session, recapitulate the previous session discussion.

Elaborate

- Maintenance of water supply system
- Different types of pipes
- Operations and maintenance of water supply system

Activity

Purpose : To recall different types of pipes used for water supply in fish ponds. It may be planned for 15-20 minutes.

Methodology: Pen and paper activity

Procedure :

- Divide the participants into 2 or 3 groups.
- Ask the participants to enlist the different types of pipes and get a volunteer out from every group one by one to write the points on the board.
- Then discuss those points with the participants.

Say

- Sum up key learnings of the above discussion.

Notes for Facilitation

- Display relevant pictures, slides or videos related to the topic.
- Encourage more participants to involve in group discussion and group activity.
- Facilitate the students if they face any kind of problem.

Exercise

Key Solutions to PHB Exercises

1. Learning by doing. Refer unit 4.1.
2. A sedimentation tank in wastewater treatment removes particles from the water. Refer section 4.1.2.

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5. Assistance in Health, Hygiene and Safety in Culture Operations

Unit 5.1 - Safety Measures

Unit 5.2 - Practice Good Personal Hygiene

Unit 5.3 - Hygiene Measures

Unit 5.4 - Manage Water Quality

Unit 5.5 - Clean the Pond Site

Unit 5.6 - Keep Fish Healthy

Unit 5.7 - Use Clean Harvest Equipments and Containers

AGR/N4955

Key Learning Outcomes

After the completion of this module, the participant will be able to:

1. Describe the process of regular maintenance of dykes or fences of culture pond.
2. State various practices used to protect the aquaculture farm from various threats poachers, natural threats, preying birds and organisms.
3. Explain the importance and process of carrying out regular cleaning of the culture pond or tank to remove sludge, algae, uneaten feed, etc.
4. State the recommended disinfectants for water bodies and the process of applying them.
5. Describe the process of identifying and removing predators/ preying organisms from the culture pond or tank.
6. Describe the process of sampling the cultured organisms to identify any problems such as parasites, pathogens, infections, etc.
7. List the signs of stress/ disease such as phenotypic disorders and spots/ lesions in the cultured organisms.
8. Describe the process of identifying, quarantining and treating the disease organisms.
9. List the signs of improvement in the quarantined organisms.
10. Explain the importance of removing the dead or moribund organisms from the water body promptly and disposing them safely.
11. State the recommended practices to protect the cultured organisms from air/ water/ fomite-borne contamination and diseases during and after harvesting.
12. Describe the basic safety checks to be undertaken before operating any tools and equipment.
13. List the PPE required for various aquaculture operations.
14. Describe the common first aid procedures to be followed in case of emergencies.

UNIT 5.1: Safety Measures

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Practice good safety and hygiene
2. Clean the pond appropriately
3. Remove weeds, rubbish chemical containers and old equipments from pondsite

Resources to be Used

- Teaching aids: Pics of fish farm and drawing of layout, illustration of a pond with dykes, fixing of net in the pond to prevent fish to escape, filter nets on the inlet to stop entry of undesirable fishes.
- Table may be prepared on a chart to enlist observations to keep vigil and undertake actions for safety of the farm in regular day and in emergency situation.
- Pictures of handling emergency situations such as flooding, mass mortality of fishes, poaching and use of bird scary devices.

Say

- Greet the participants and recall the previous session learning outcomes.

Elaborate

- Ensure suitable measures for protection from natural calamities such as flood, protect dyke from erosion or break
- Ensure protection and prevent escape of the cultured organisms
- Identify common predators and preying organisms in water bodies
- Restrict entry of unauthorized persons into the premises
- Be fully aware of the dosage, toxicity level and method of application of chemicals/ medicine used for fish culture
- Ensure all chemicals are adequetly labeled and stored safely
- Undertake basic safety checks before operation of any equipments

Demonstrate

- Demonstrate use of safety measure such as apron, hand gloves, boots, etc.
- Demonstration of using webbings of bamboo to prevent escape of fishes.

Field Visit

Purpose : To enhance the knowledge on safety measures.

Methodology : Field visit and the time varies according to the location, it may be 2 hours.

- Arrange a visit to fish farm to explain safety measures in reference to preparations and precautions against natural calamities such as floods, fire, breaking or erosion of dykes and over flowing of pond water, prevent loss of fish crop due to flooding, entry of unwanted fishes.
- Ask the participants to interact with farmer regarding the safety measures.
- Prepare list of do's and don'ts for the farm for display at the farm.

Notes for Facilitation

- Preparation of teaching/training aids.
- Preparation or procuring of desired models.
- Establish linkages with the fish farm for conducting practical and hands on experience.
- Display of charts, posters, collages, showing good practices to be followed with respect to safety measures.
- Prepare chart of safety measures in handling chemicals and for dosage, toxicity level method of application of chemicals/ medicines.
- Procure and display basic safety checks and guidelines to carry out regular inspection to prevent spread of diseases.

Exercise

Key Solutions to PHB Exercises

1. 10 safety and hygiene practices
    - Take Regular shower.
    - Wash your hands frequently
    - Maintain oral hygiene practices.
    - Trim your nails and wash your hairs.
    - Clean your nose and ears.
    - Wear fresh and warm clothes.
    - Food hygiene is important too.
    - Flushing toilets after every use.
    - Keeping rooms clean.
    - Proper cleaning of utensils clothes.

UNIT 5.2: Practice Good Personal Hygiene

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Practice good safety and hygiene
2. Clean the pond appropriately
3. Remove weeds, rubbish chemical containers and old equipments from pondside

Resources to be Used

- Self learning materials and teaching aids to explain factors responsible for personal hygiene and practices to be undertaken for maintaining hygienic conditions.
- Apron/working uniform, gloves, soap, towels, boots,etc.

Say

- Greet the participants and before beginning the session, recapitulate the previous session discussions.

Ask

- What do you understand by personal hygiene and maintaining hygienic conditions at the work place?
- Who will tell, what hygienic conditions are to be followed during netting, eradication of weeds, aquatic insects, cleaning of hatchery, handling and disposal of dead fishes, cleaning of nets, equipment and fishing boat.

Explain

- Practice good personal hygiene
- Health and environment safety

Activity

Purpose: To understand the need for personal hygiene
Methodology: Discussion for 15 minutes.
Expected Outcome: Participants have to list the external parts of the body that need to be kept clean and healthy, while explaining why it is needed.

- Put up the power point slide and start a discussion around the subject – what is personal hygiene and why it is needed.

Do

- During the activity, encourage the participants to ask questions and have active participation.
- At the end of the activity, clarify the doubts the participants.
- Provide your own expert advice and opinion regarding the topic.

Notes for Facilitation

- Prepare teaching aids and learning resource material
- Make an inventory of regulations for maintaining hygienic environment.
- Prepare strategy to enact regulations about sanitation and hygiene strictly.
- Organise a field visit to a commercial aquaculture farm to show these practices.
- Procure norms/regulations of national and international organizations and display the same at the workshop and fish farm, such as WHO.
- Prepare slogans to put at the farm such as given by WHO;

A) Practice good personal hygiene B) Clean the pond site C) Manage water quality
D) Keep fish healthy E) Use clean harvest equipment and containers.

Exercise

Key Solutions to PHB Exercises

1. Decaying debris, fish waste, and uneaten fish food accumulate quickly on your pond's floor. Make sure you clean out your pond regularly to avoid a spike in your water's ammonia levels.
2. Learning by doing. Refer section 5.2.1.

UNIT 5.3: Hygiene Measures

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Use toilet or latrine to urinate and defecate.
2. Wash and dry hands with a clean, dry towel after toileting, diapering a child and contact with animals.
3. Cover cuts and sores when working around fish ponds.
4. Wash hands and change clothes after working around the ponds and harvesting fish.

Resources to be Used

- Available objects such as a white board, duster, flip chart board / paper etc.
- Slides in power point presentation.

Elaborate

- Identify a quarantined area and implement protocols of quarantine
- Be aware of the potential for bacterial and other contamination from human handling
- Practice good personal hygiene

Practical

- Take participants to slightly contaminated pond and show them important points to follow the quarantine measure

Activity

Purpose: To perceive the topic and time will be 20 minutes.

Methodology : Pen and paper

- Divide the participants into groups
- Ask the participants to label the chart paper to practice good personal hygiene
- Now discuss the points of every group.

Notes for Facilitation

- Encourage active participation and engagement from students, such as through group discussions and hands-on exercises.
- Get participants to open up their participant handbooks and solve the exercises given at the end of the unit.

Exercise

Key Solutions to PHB Exercises

1. Identify quarantine zones and implement quarantine protocols
    - Collect dead fish from the pond as soon as possible
    - If disease is to be diagnosed, it is best to wrap the specimen in a damp cloth for laboratory
    - analysis.
    - Protecting dead fish from being eaten by predators to prevent the spread of disease

    Refer section 5.3.1.

UNIT 5.4: Manage Water Quality

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Select a water source that has a very low chance of contamination with heavy metals, other chemicals and harmful microorganisms
2. Prevent people and animals, including ducks, geese and pets, from flying over, wading or swimming in ponds.
3. Do not pen animals over the pond
4. Keep rubbish, food and faucal waste removed from the home away of the pond.

Resources to be Used

- Available objects such as a white board, duster, flip chart board / paper etc.
- Slides in power point presentation

Explain

- Describe why water quality is important?

Elaborate

- Potential source of Water contamination

Field Visit

Purpose: To enhance the knowledge about water quality.

Methodology: Field visit and the time varies according to the location, it may be 1-2 hours.

Expected outcome:

- Confidence building
- Knowledge enhancement
- Organize a visit and ask the participants to examine the water quality.

Notes for Facilitation

- Ensure that all the participants have through understanding about water quality.
- Ask the participants if they require any kind of help.
- Organize visit to near by fish farms for better understanding of the concept.

Exercise

Key Solutions to PHB Exercises

1. Physical parameters: pH, temperature, salinity, dissolved oxygen, and carbon dioxide levels. Organic contaminants. Refer unit 5.4.

UNIT 5.5: Clean The Pond Site

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Locate ponds away from latrines, livestock, and poultry
2. Choose a pond site where the chance of contamination with heavy metals or other harmful chemicals is low
3. Keep livestock and poultry in an area that prevents access to the fish pond
4. Remove weeds, rubbish chemical containers and old equipment from pond site

Resources to be Used

- Available objects such as a white board, duster, flip chart board / paper etc.
- Slides in power point presentation

Elaborate

- Cleaning pond site regularly to avoid contamination
- Health maintenance

Field Visit

Purpose : To enhance the knowledge on clean pond site

Methodology : Field visit and the time varies according to the location, it may be 2 hours.

- Divide class into 5 groups and ask to observe areas which are contaminated and non-contaminated.
- Identify the sources of contamination in the area and focus the discussion on how these sources can be identified and removed, or decontaminated.

Notes for Facilitation

- Students must be encouraged for going through the participant handbook and come prepared with thorough reading.

Exercise

Key Solutions to PHB Exercises

1. Do's

- Do cycle the tank before adding fish
- Do test and monitor the water
- Do frequent water changes

2. Don't Do

- Don't forget to acclimate newcomers
- Don't overcrowd the tank
- Don't overfeed the fish
- Don't mix too many species

UNIT 5.6: Keep Fish Healthy

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Stock ponds to the proper density with healthy fish seed stock from a certified hatchery or reliable supplier
2. Maintain stock at the proper density in the growing pond
3. Remove and dispose sick and dead fish daily
4. Avoid using unapproved chemicals to maintain fish health

Resources to be Used

- Available objects such as a white board, duster, flip chart board / paper etc.
- Slides in power point presentation

Explain

- Health maintenance
- Determine seed quality

Activity

Purpose : Knowledge enhancement . Time may be plan for 15 minutes.

Methodology : Pen and Paper activity

- Ask each participants to write short note on health maintenance.
- Ask 4-5 participants to stand randomly and share the findings among their peers.

Do

- Clear the doubts of students related to the topic.
- Motivate the students to open up and ask questions.

Notes for Facilitation

- Students must be encouraged for going through the participant handbook and come prepared with thorough reading.

Exercise

Key Solutions to PHB Exercises

1. To properly balance your pond, you should stock your pond with three prey fish, like perch or bluegill, for every predator fish, such as bass. Refer unit 5.6.
2. The best way to isolate sick fish is to set up a hospital tank. Hands on practice with the help of trainer.

UNIT 5.7: Use Clean Harvest Equipment and Containers

Unit Objectives

After the completion of this unit, the participant will be able to:

1. Wash harvest containers and equipment with clean water
2. Harvest fish early in the day and transport live or cool quickly
3. Use clean water to wash harvested fish
4. Keep harvested fish in clean containers on non-porous material

Resources to be Used

- Available objects such as a white board, duster, flip chart board / paper etc.
- Slides in power point presentation

Elaborate

Discuss in class and elaborate the process for :

- How to use clean harvest equipment
- Workplace investigation and reporting issues
- Prevention of accidents and losses
- Personal protective equipments
- Hazards, accidents, fires and emergencies
- First aid

Say

- Clean the area used for washing, sorting and packing fish at the end of each day to reduce the risk of contamination.

Practical

- Go to field and harvest the fish
- Keep harvested fish by putting them in containers.
- Use clean ice to cover the fish entirely.

Activity

Purpose: To acquaint about the harvest equipments. This activity may be planned for 15-20 minutes.

Methodology : Pen and per activity

- Ask the participants to list out equipments.
- Ask any one of the participants to pin point the list on white board.
- Ask the other participants to discuss amongst themselves and ask any queries realised to the topic.

Do

- Clear the doubts of students related to the topic.
- Motivate the students to open up and ask questions.

Notes for Facilitation

- Students must be encouraged for going through the participant handbook and come prepared with thorough reading.

Exercise

Key Solutions to PHB Exercises

1. Alcohol, Chlorine and chlorine compounds, Formaldehyde, etc. Refer unit 5.7.

Notes

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

ASCI
Agriculture Skill Council of India

6. Employability Skills (30 Hours)

To access content on Employability Skills, click here:
https://eskillindia.org/NewEmployability
Scan the QR code below to access the ebook

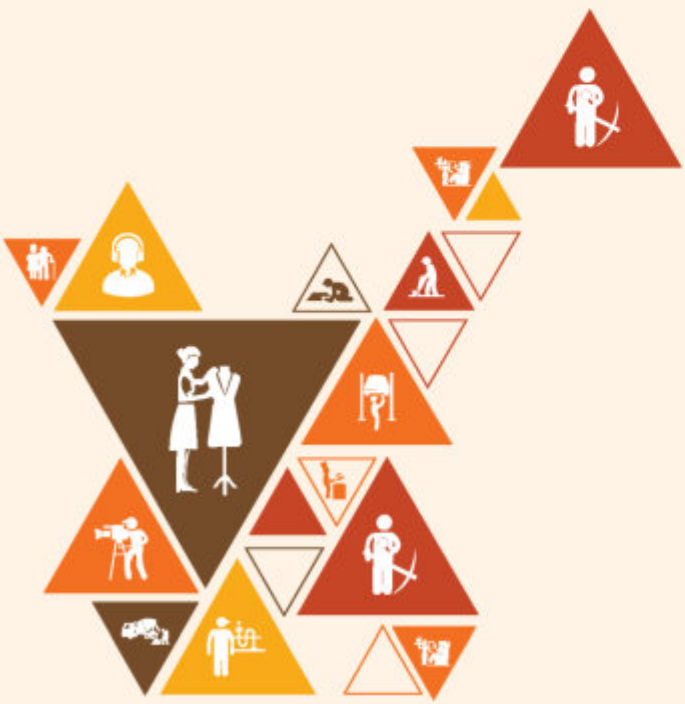
DGT/VSQ/N0101

7. Annexures

Annexure I - Training Delivery Plan

Annexure II - Assessment Criteria

Annexure III - QR Codes –Video Links



Annexure I

Training Delivery Plan

Training Delivery Plan			
Program Name:	Aquaculture Worker		
Qualification Pack Name & Ref. ID	AGR/Q4904		
Version No.	3.0	**Version Update Date**	30/12/2021
Pre-requisites to Training (if any)	8th Class (Pass and pursuing continuous regular schooling) OR 5th Class with 4 Years of experience relevant experience OR Certificate-NSQF (Level-3 (Hatchery Production Worker) with 6 Months of experience relevant experience OR Ability to read and write with 5 Years of experience relevant experience		
Training Outcomes	**By the end of this program, the participants will be able to:** • Describe the process of assisting in preparing for culture operations. • Demonstrate the process of assisting in stocking, post-stocking, harvesting and post-harvest processing. • Demonstrate the process of assisting in maintaining the water system, waste disposal system, tools and equipment. • Demonstrate the process of assisting in maintaining health, hygiene and safety in culture operations		

S. No.	Module Name	Session Name	Session Objectives	NOS References	Methodology	Training Tools/Aids	Durati-ons
1	Introduction T: 05:00 (HH:MM)	1. Fresh water Aquaculture sector in India	• Explain freshwater pond resources • Discuss Organizational structure of a fish farm • Explain Employment opportunity	Bridge Module	Class room lecture, Group activity	White board, duster etc. Power Point slides.	T: 1:00
		2. Fish Farming-I	• Explain Basic information on freshwater fish farming • Draw water and treat it for use in the fish farm		Lecture, Team activity	White board, duster etc. Power point slides.	T: 1:00
		3. Fish Farming-II	• Use lime to correct pH of soil and water • Applying organic manure and inorganic fertilizers • Manage nursery, rearing and grow-out ponds		Lecture, Team / individual activity, demonstration etc.	White board, duster etc. Power point slides.	T:2:00
		4. Job Role of an Aquaculture Worker	• Explain roles and responsibilities on farm		Lecture, Team Activity, role play etc.	White board, duster etc. Power point slides.	T:1:00
2	Assistance in culture unit preparation activities T: 25:00 P: 60:00 (HH:MM)	1. Drawing and storage of water	• Explain the importance of water storage • Undertake water storage	AGR/N4919 PC6, PC7, KU1, GS1-GS6	Lecture, demonstration , exercise, activity	White board, duster etc. Water Pump, Air or Oxygen Diffusers	T: 3:00 P: 5:00
		2. Water Treatment-I	• Apply chlorine for water treatment • Apply lime for correcting pH	AGR/N4919 PC7, KU3, GS1-GS6	Lecture, demonstration , exercise, activity	White board, duster etc. Aerators, Mechanical Filters, Tubes, Power Backup	T: 2:00 P: 6:00
		3. Water Treatment-II	• Explain about turbidity and pH	AGR/N4919	Lecture, demonstration ,	White board, duster etc.	T: 2:00 P: 5:00

S. No.	Module Name	Session Name	Session Objectives	NOS References	Methodology	Training Tools/Aids	Durati-ons
				PC8, KU4, GS1-GS6	exercise, activity	Aerators, Mechanical Filters	
		4. Apply Organic Manure -I	• Explain when to use organic manures	AGR/N4919 PC3, KU6, GS1-GS6	Lecture, demonstration , exercise, activity	White board, duster etc. Tubes, Power Backup	T : 2:00 P : 6:00
		5. Apply Organic Manure -II	• Explain benefits of using organic fertilizers in the pond	AGR/N4919 PC3, PC5, KU6, GS1-GS6	Lecture, demonstration , exercise, activity	White board, duster etc. Tubes, Power Backup	T: 2:00 P: 5:00
		6. Eradicate Predatory and Weed Fish -I	• Identify the common predatory and weed fishes	AGR/N4919 PC2, KU4, GS1-GS6	Classroom lecture, discussion, demonstration, activity	White board, duster etc. Tubes, Power Backup	T: 2:00 P: 6:00
		7. Eradicate Predatory and Weed fish -II	• Explain the methods to eradicate predatory and weed fishes	AGR/N4919 PC4, KU4, GS1-GS6	Classroom lecture, discussion, demonstration, activity	Whiteboard, Marker, Projector, Laptop etc.	T : 3:00 P : 5:00
		8. Pond Fertilization-I	• Explain the need and time of pond fertilization	AGR/N4919 PC8, KU4, GS1-GS6	Lecture, discussion, demonstration, activity	White board, duster etc. Aerators, Mechanical Filters, Tubes, Power Backup	T : 2:00 P : 6:00
		9. Pond Fertilization-II	• Explain the types of inorganic fertilizers	AGR/N4919 PC3, KU6, GS1-GS6	Lecture, discussion, demonstration, activity	White board, duster etc. Aerators, Mechanical Filters	T : 2:00 P : 5:00
		10. Aquatic Insects Control and Treatment	• Explain Prevention of water insects	AGR/N4919 PC2, GS1-GS6	Lecture, discussion, demonstration, activity	White board, duster etc. Aerators, Mechanical Filters,Power Backup	T : 2:00 P: 6:00
		11. Recap	• Recapitulate complete module learning	AGR/N4919 PC1-PC8, KU1-KU6, GS1-GS6	Lecture, discussion, demonstration, activity	White board, duster etc. Aerators, Mechanical Filters, Tubes, Power Backup	T : 3:00 P : 5:00

S. No.	Module Name	Session Name	Session Objectives	NOS References	Methodology	Training Tools/Aids	Durati-ons
3	Assistance in stocking, post stocking, harvesting and post-harvest processing T: 30:00 P: 60:00 (HH:MM)	1. Sampling and Netting Operation -I	• Explain the right time of sampling • Explain the method of sampling	AGR/N4920 PC6, KU8, GS1-GS9	Classroom lecture, discussion, demonstration, activity	White board, marker, pen, note pad, PHB, etc.	T: 3:00 P: 5:00
		2 Sampling and Netting Operation -II	• Identify different nets used for different types of sampling • Recognize the different types of aquatic weeds	AGR/N4920 PC2, PC6, KU4, GS1-GS9	Classroom lecture, activity, group discussion	White board, marker, pen, note pad, PHB, etc. Dip Net	T: 3:00 P: 5:00
		3. Supplementary Feeding -I	• Explain the feed requirements of fish	AGR/N4920 PC5, KU5, KU6, GS1-GS9	Classroom lecture, demonstration, practical	White board, duster etc. Grinder, Mixer, Pelletiser, Profi-Feeders	T: 2:00 P: 5:00
		4. Supplementary Feeding -II	• Explain the different feeding methods	AGR/N4920 PC4, PC5, KU9, GS1-GS9	Classroom lecture, discussion, demonstration , activity	White board, duster etc. Grinder, Mixer, Pelletiser, Profi-Feeders	T : 2:00 P : 5:00
		5. Manure and Fertilizers	• Applying different types of minerals used in aquaculture	AGR/N4920 PC7, KU17, GS1-GS9	Classroom lecture, discussion, demonstration , activity	Whiteboard, marker, pen, note pad, participant handbook, related power point presentation, etc.	T: 2:00 P: 5:00
		6. Aeration and Water Replenishment	• Explain the methods of aeration of water • Explain the right quantity of water to be replenish	AGR/N4920 PC8, KU18, GS1-GS9	Classroom lectures, Activity, Demonstration	White board, marker, pen, note pad, PHB, etc. Power Backup	T: 3:00 P: 5:00
		7. Periodic Checking	• Explain the importance of periodic checkups in aquaculture • Taking appropriate action if any	AGR/N4920 PC9, KU7, GS1-GS9	Classroom lectures, Activity, Demonstration	Whiteboard, marker, pen, note pad, PHB, related power point presentation, etc.	T: 3:00 P: 5:00

S. No.	Module Name	Session Name	Session Objectives	NOS References	Methodology	Training Tools/Aids	Durati-ons
			abnormality is found			Pelletiser, Profi-Feeders, Scareheron	
		8. Harvesting	• Explain the desired size of fish in partial harvesting • Explain about ensuring minimum handling of fish	AGR/N4920 PC12, KU10, KU11, GS1-GS9	Classroom lectures, Activity, Demonstration	White board, marker, pen, note pad, PHB, etc. Harvesting Gear	T: 3:00 P : 5:00
		9. Eradication of Aquatic Weeds-I	• Explain the different methods of removing wild weeds • Identify the tools and uses of various equipment for removing weeds	AGR/N4920 PC9, GS1-GS9	Classroom lectures, Activity, Demonstration	Whiteboard, marker, pen, note pad, PHB, etc. Weed Eradication Equipment	T: 2:00 P :5:00
		10. Eradication of Aquatic Weeds-II	• Recognize different types of Aquatic weeds	AGR/N4920 PC9, KU19, GS1-GS9	Classroom lecture, activity, group discussion	Whiteboard, marker, pen, note pad, PHB, etc. Weed Eradication Equipment	T : 3:00 P : 5:00
		11. Stocking	• Explain different stages of growth and rearing of fish • Explain the proper amount of fish stocking	AGR/N4920 PC3, KU19, GS1-GS9	Classroom lecture, activity, group discussion	Whiteboard, marker, pen, note pad, PHB, etc. Power Backup	T : 2:00 P : 5:00
		12. Recap	• Recapitulate complete module learning	AGR/N4920 PC2-PC8, KU1-KU9, GS1-GS9	Classroom lecture, activity, Q/A session	Whiteboard, marker, pen, note pad, PHB, etc.	T : 2:00 P : 5:00
4	Assistance in maintaining the water system, waste disposal system, tools and equipment T: 20:00	1. Maintaining Water -I	• Explain the importance of arranging for an alternative water supply	AGR/N4964 PC1, KU1, GS1-GS7	Classroom lecture, activity	Whiteboard, marker, pen, note pad, participant handbook, related power point presentation, etc.	T: 3:00 P: 5:00

S. No.	Module Name	Session Name	Session Objectives	NOS References	Methodology	Training Tools/Aids	Durati-ons
	P: 40:00 (HH:MM)	2. Maintaining Water -II	• Describe the process of cleaning the water pipes and carrying out repair and maintenance	AGR/N4964 PC3, KU2, GS1-GS7	Classroom lecture, discussion, demonstration, activity	Whiteboard, marker, pen, note pad, PHB, etc. Ultra filtration Systems, Vacuum Filters	T: 2:00 P: 5:00
		3. Maintaining Water -III	• Explain how to disconnect and reconnect the water supply	AGR/N4964 PC5, KU3, GS1-GS7	Classroom lecture, activity, practical	Whiteboard, marker, pen, note pad, PHB, etc. Ultra filtration Systems, Vacuum Filters	T: 3:00 P: 5:00
		4. Waste Disposal Systems-I	• Explain the use of the relevant repair and maintenance tools, equipment and materials.	AGR/N4964 PC5-PC8, KU5-KU7, GS1-GS7	Classroom lecture, discussion, demonstration, activity	Whiteboard, marker, pen, note pad, PHB, related power point presentation, etc. Pumping Machinery, Bucket.	T: 2:00 P: 5:00
		5. Waste Disposal Systems -II	• Describe the process of carrying out repair and maintenance	AGR/N4964 PC6, KU4, KU6, GS1-GS7	Classroom lecture, Demonstration, activity, group discussion	Whiteboard, marker, pen, note pad, PHB, related power point presentation, Ultra filtration Systems, etc.	T: 3:00 P: 5:00
		6. Waste Disposal Systems -III	• Explain how to replace any faulty equipment.	AGR/N4964 PC4, KU7, GS1-GS7	Classroom lecture, Demonstration, activity, group discussion	Whiteboard, marker, pen, note pad, participant handbook, related power point presentation, etc.	T : 2:00 P : 5:00
		7. Waste Disposal Systems -IV	• Describe the process of testing the aquaculture equipment	AGR/N4964 PC11, KU8, GS1-GS7	Classroom lecture, Demonstration, activity, group discussion	Whiteboard, marker, pen, note pad, PHB, related power point presentation,	T : 3:00 P : 5:00

S. No.	Module Name	Session Name	Session Objectives	NOS References	Methodology	Training Tools/Aids	Durati-ons
						Ultra filtration Systems, etc	
		8. Recap	• Recapitulate complete module learning	AGR/N4964 PC1-PC8, KU1-KU8, GS1-GS7	Classroom lecture, Demonstration, activity	White board, duster etc. Pumping Machinery, Bucket, Pump and Spout Pipe.	T : 2:00 P : 5:00
5	Assistance in health, hygiene and safety in culture operations T: 10:00 P: 20:00 (HH:MM)	1. Safety Measures	• Practice good safety and hygiene • Clean the pond appropriately • Remove weeds, rubbish chemical containers and old equipments	AGR/N4955 PC1-PC4, KU1, KU2, GS1-GS8	Classroom lecture, discussion, demonstration, activity	Whiteboard, marker, pen, note pad, PHB, etc. PPE, First Aid Kit, Equipment used in Medical Emergencies.	T: 2:00 P: 4:00
		2. Practicing Good Personal Hygiene	• Practice good safety and hygiene • Clean the pond appropriately	AGR/N4955 PC1-PC4, KU1, KU2, GS1-GS8	Classroom lecture, discussion, demonstration, activity	Whiteboard, marker, pen, note pad, PHB, etc. PPE, First Aid Kit, Equipment used in Medical Emergencies	T: 1:00 P: 2:00
		3. Hygiene Measures	• Use toilet or latrine to urinate and defecate. • Wash and dry hands with a clean, dry towel • Cover cuts and sores	AGR/N4955 PC13, KU12, GS1-GS8	Classroom lecture, activity, group discussion	Whiteboard, marker, pen, note pad, participant handbook, related power point presentation, etc.	T: 2:00 P: 4:00
		4. Managing Water Quality	• Explain the Selection of a water source • Prevent people and animals	AGR/N4955 PC6, KU5, GS1-GS8	Classroom lecture, discussion, demonstration, activity	Whiteboard, marker, pen, note pad, PHB, etc. PPE, Equipment used in Medical Emergencies	T: 1:00 P: 2:00
		5. Cleaning Pond Site	• Describe the location of ponds	AGR/N4955 PC13, KU12, GS1-GS8	Classroom lecture, discussion, demonstration, activity	Whiteboard, marker, pen, note pad, PHB, etc. PPE, First Aid Kit	T : 2:00 P : 4:00

S. No.	Module Name	Session Name	Session Objectives	NOS References	Methodology	Training Tools/Aids	Durati-ons
			• Describe the selection of free from contamination pond site				
		6. Keeping Fish Healthy	• Explain stock ponds to the proper density • Maintain stock at the proper density in the growing pond	AGR/N4955 PC9, GS1-GS8	Classroom lecture, discussion, demonstration, activity	Whiteboard, marker, pen, note pad, PHB, etc. PPE, First Aid Kit	T : 1:00 P : 2:00
		7. Using Clean Harvest Equipment and Containers	• Wash harvest containers and equipment • Explain Harvest fish early in the day and transport live or cool quickly	AGR/N4955 PC14, KU13, GS1-GS8	Classroom lecture, discussion, demonstration, activity	Whiteboard, marker, pen, note pad, participant handbook, related power point presentation, etc. PPE kit , disinfectants etc.	T : 1:00 P : 2:00

S. No.	Module Name	Session Name	Session Objectives	NOS References	Methodology	Training Tools/Aids	Durations
6.	Employability Skills (30 hrs)	Introduction to Employability Skills	• Describe the importance of Employability Skills • Preparea note on different industries, trends, required skills	DGT/VSQ/ N0101	Team Activity: Interactive discussion	White-board and Markers Chart paper and sketch pens LCD Projector, Laptop for Presentation, audio visual aids, note pad, paper, pen, computers etc.	1 hr
		Constitution al Values: Citizenship	• Detail the principles of the constitutio n of India • Identify the various environme ntally sustainable practices		Class room lecture, discussion, Demonstration, practical		1 hr
		Becoming a Professional in the 21st Century	• Discuss relevant 21stcentury skills required for employment • Practice critical thinking and decision making skills		Class room lecture, discussion, Demonstration, practical		1 hr
		Basic English Skills	• Read English text with appropriate articulation • Practice basic English words, sentence s and punctuat ion		Team Activity: Role play, video session		2hrs

S. No.	Module Name	Session Name	Session Objectives	NOS References	Methodology	Training Tools/Aids	Durations
		Financial and Legal Literacy	• Discuss various financial institutions, products, and services • Explain the common components of salary such as Basic, PF, Allowances (HRA, TA, DA, etc.), tax	DGT/VSQ/ N0101	Class room lecture, Group discussion, demonstration, activity		4 hrs
		Essential Digital Skills	• Detail the use and features of various MS Office tools, like MS Word, MS Excel, MS PowerPoint, etc. • Demonstrate how to operate digital devices • Create an e-mail id and follow e- mail etiquette to exchange e - mails Describe the role of digital technology in day-to- day life and the workplace	DGT/VSQ/ N0101 -			3 hrs

S. No.	Module Name	Session Name	Session Objectives	NOS References	Methodology	Training Tools/Aids	Durations
		Financial and Legal Literacy	• Discuss various financial institutions, products, and services • Explain the common components of salary such as Basic, PF, Allowances (HRA, TA, DA, etc.), tax	DGT/VSQ/ N0101	Class room lecture, Group discussion, demonstration, activity		4 hrs
		Essential Digital Skills	• Detail the use and features of various MS Office tools, like MS Word, MS Excel, MS PowerPoint, etc. • Demonstrate how to operate digital devices • Create an e-mail id and follow e- mail etiquette to exchange e - mails Describe the role of digital technology in day-to- day life and the workplace	DGT/VSQ/ N0101			3 hrs

S. No.	Module Name	Session Name	Session Objectives	NOS References	Methodology	Training Tools/Aids	Durations
		Entrepreneurship	• Describe the types of entrepreneurship and enterprises • Describethe 4Ps of Marketing- Product, Price, Place and Promotion and apply them as per requirement		Class room lecture, discussion, Demonstration, practical		7 hrs
		Customer Service	• Identify types of customers and how to deal with them • Identify methods to get customer feedback and how to implement them • Explain various tools used to collect customer feedback • Discuss the significance of maintaining hygiene and dressing appropriately	DGT/VSQ/ N0101	Class room lecture, discussion, Demonstration, practical, Team Activity: Role play, video session		4 hrs
		Apprenticeships and Jobs	• Practice personal grooming strategies • Illustrate the use of online platforms for job hunting • Detail the concept of Apprenticeship • Demonstrate how to enroll for Apprenticeship programs. • Draft a professional Curriculum Vitae (CV) • Role play a mock interview	DGT/VSQ/ N0101			2 hrs

Annexure II

Assessment Criteria

CRITERIA FOR ASSESSMENT OF TRAINEES

(For Updated 'Assessment Criteria', please refer to Qualification Pack of this Job role available at https://www.nqr.gov.in/)

Assessment Criteria for ASCI- Aquaculture Worker	
Job Role	**Aquaculture Worker**
Qualification Pack	**AGR/Q4904**
Sector Skill Council	**Agriculture**

S.No.	Guidelines for Assessment
1.	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2.	The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3.	Assessment will be conducted for all compulsory NOS, as well as the selected elective NOS/set of NOS.
4.	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
5.	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria.
6.	To pass the Qualification Pack , every trainee should score a minimum of 50% of aggregate marks to successfully clear the assessment.
7.	In case of *unsuccessful completion*, the trainee may seek reassessment on the Qualification Pack.

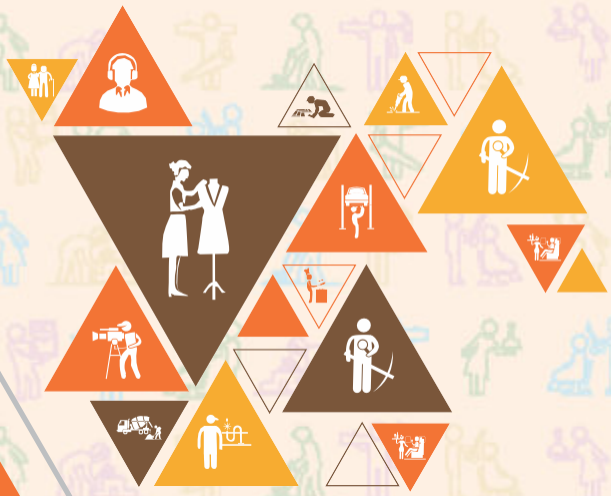
National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
AGR/N4919.Assist in culture unit preparation activities	30	40	-	30	100	25
AGR/N4920.Assist in stocking, post stocking, harvesting and post-harvesting activities	30	40	-	30	100	30
AGR/N4964.Assist in maintaining the water system, waste disposal system, tools and equipment	30	40	-	30	100	25
AGR/N4955.Follow the hygiene and safety practices in culture operations	30	40	-	30	100	15
DGT/VSQ/N0101.Employability Skills (30 Hours)	20	30	0	0	50	5
Total	**140**	**190**	**0**	**0**	**450**	**100**

Annexure-III

QR Codes –Video Links

Chapter No.	Unit No.	Topic	QR Code Links	QR code (s)
Chapter -1 Introduction to the Role of An Aquaculture Worker	Unit 1.1 – Fresh Water Aquaculture Sector in India	Aquaculture sector of India	https://youtu.be/ZrsCdDWMBEg	Aquaculture sector of India
Chapter -2 Assistance in Culture Unit Preparation Activities	Unit 2.2 - Water Treatment	Use of lime in fish farming	https://youtu.be/hs5yLjq_n5E	Use of lime in fish farming
	Unit 2.4 - Eradicate Predatory and Weed Fish	Control of predatory & weed fishes	https://youtu.be/WOe1ynjPAlA	predatory & weed fishes
	Unit 2.5 - Pond Fertilization	Fish pond fertilization	https://youtu.be/nC0dHc3bTFI	Fish pond fertilization
	Unit 2.6 - Aquatic Insects Control and Treatment	Aquatic insects & control	https://youtu.be/Q9JSbF5gjTc	Aquatic insects & control
Chapter -3 Assistance in Stocking, Post Stocking, Harvesting and Post-Harvest Processing	Unit 3.1 - Sampling and Netting Operation	Types of netting use in aquaculture	https://youtu.be/RvZv3Rt_zwY	Types of netting use in aquaculture
	Unit 3.4 - Aeration and Water Replenishment	Importance of aeration in aquaculture	https://youtu.be/V7O8mBzPndk	Importance of aeration in aquaculture
	Unit 3.7 - Eradicate Aquatic Weeds	Different aquatic weed found in fish culture pond	https://youtu.be/rhaNoygTP_c	Different aquatic weed found in fish culture pond
		Aquatic weed control	https://youtu.be/1OmussJovxQ	Aquatic weed control

Chapter No.	Unit No.	Topic	QR Code Links	QR code (s)
Chapter -5 Assistance in Health, Hygiene and Safety in Culture Operations	Unit 5.1 - Safety Measures	Aquaculture: apply safety measures in fish farm operation	https://youtu.be/Nq_7xxWRPJg	Aquaculture: apply safety measures in fish farm operation



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