



Animal Production

Level II

Learning Guide #31

Unit of Competence: Assist Fish Production

Module Title: Assisting Fish Production

LG Code: AGR APR2 M 10 LO1-LG31

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**LO1: Prepare materials, tools and equipments
for fish farming**



This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:–

- Prepare materials, tools and equipment for fish farming
- Identify, check and report materials, tools and equipment
- Report of all materials, tools and equipment
- use manual handling techniques for loading or unloading materials
- Select & check suitable Personal protective equipment (PPE)
- Apply Occupational Health and Safety (OHS) requirements

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to:

- Required materials, tools and equipment are identified according to lists provided and/or supervisor instructions.
- Checks are conducted on all materials, tools and equipment, and insufficient or faulty items are reported to supervisor.
- Correct manual handling techniques are used when loading and unloading materials to minimize damage
- Suitable PPE are selected and checked prior to use.
- Work task is provided according to OHS requirements and supervisor instructions.



Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3 and Sheet 4”.
4. Accomplish the “Self-check 1, Self-check 2, Self-check 3 and Self-check 4” in **page -6, 9, 12 and 14** respectively.



INTRODUCTION TO FISH FARMING

It has been stated that Ethiopia could produce about 40 million kg of fish per year in a sustainable manner from different lakes and rivers. Despite the availability of a considerable big fish resource, production so far could not exceed 15-20% of the potential available for exploitation

However, with the growing realization of the importance of fish as high quality food, and food shortage due to the increased population pressure. Intense exploitation of fish resource not only from the natural water bodies such as lakes and rivers, but also from the artificially fish cultured ponds, dams and reservoirs is very essential.

Therefore, this unit of compliance focus on the preparing materials tools and equipments , body parts of fish, undertake fish rising activates and clean up on accomplishments of the work.

Definitions

Fish- is an aquatic-vertebrate cold-blooded animal that breathes oxygen by means of gills, and moves and keep balance by fins, reproduce by laying eggs and its body covered by skin and scale.

Fish farming (culture) – is the large scale rearing or raising of fish in artificially prepared ponds and reservoirs on controlled and manageable manner for commercial purpose.

Fish farming is the intensive production of fish from artificially prepared ponds or reservoirs. Its main objective is to produce large amount of fish with a minimum cost so as to increase profitability of the business.

Fresh water (Inland water)-is a water contained in rivers, lakes, underground, rain water and streams.

Why fish are farmed?

Nowadays there is an increasing population pressure throughout the world with a steadily increasing demand for protein. This forced people to exploit the natural resources of the aquatic environment, mainly fish which is the largest single source of animal protein and the fastest growing food commodity from natural or artificial water bodies. Thus, the reason why fish are farmed is summarized as follows.



- Fish are a high-value, marketable product used to generate high income even at the subsistence level.
- Fish is primarily used as food. From fish one can get abundant nutrients such as proteins, fats, vitamins and minerals, for this reason. Fish protein is described as first class protein.
- Fish farming could be integrated with livestock and crop production sectors that can help for efficient utilization of our resources.
- Part of the fish is used for the preparation of fish meal which is the best source of animal protein for ruminants & poultry.
- Fish farming is the best alternative because the exploitation of fish from natural water bodies is becoming less and less profitable.

Information Sheet-01

Identifying and checking of all materials, tools and equipment

Fish farming require some essential materials, tools, equipment and facilities which are used for varies purposes. Such equipment may be used for maintenance and repairs, harvesting the fish, monitoring and maintaining water quality, packaging stock, excluding predators and pests, and other miscellaneous facilities for maximizing the use of various inputs. This information sheet provides you detail description on materials, tools, equipment and facilities which are used in a variety of categorized tasks in fish farming.

Before starting fish farming activity the necessary materials, *tools and equipment* should be identifies and prepare as follow:-

- Polyethylene bag
- Lime
- Feed
- Fertilizer
- Stocking materials(fry, fingerlings, egg, larvae) fishing nets
- buckets
- Ice box, refrigerator
- Weighing balance
- Measuring board



- various needles
- knives
- Thermometer
- pH meter
- Do meter
- Wooden ladle with long handle,
- Hoe
- Rake
- Litmus paper
- Conductivity meter
- Secchi disk
- Ammonia and Nitrate test Kits
- Plankton nets
- Benthic sampler
- loaders and vehicles
- spades, forks, rakes and hoe
- harvesting and storing equipments
- Spray equipment etc.

Self-Check 1	Written Test
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Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. Write the functions of at least 3 equipments ? (5 points)

2. Write at least 5 equipments

Note: Satisfactory rating - 10 points Unsatisfactory - below 10 points

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____



Short Answer Questions

Information Sheet-01

Reporting of all materials, tools and equipment

All materials, tools and equipments will be checked and reported their proper functions before going to the activities here are some equipments will list down how it works.

A. Water Quality testing equipment

Water-quality testing is one of the most important jobs in aquaculture. If the water quality of a culture structure, such as a pond or tank, is poor, stock can suffer from health problems such as damage and diseases. A range of tools and test kits are used to test water-quality parameters such as the level of dissolved oxygen, pH, alkalinity, water hardness, and ammonia levels and so on.

1. Dissolved oxygen meter

Description-A dissolved oxygen meter is used to measure the level of *dissolved oxygen* in water. It consists of a probe and a meter. The probe is lowered into water and gently moved from side to side, and then a reading is taken from the meter.



Calibration and use

Follow these steps to calibrate and use a dissolved oxygen meter:

- I. Turn the meter on and inspect the probe for damage.
- II. Place the probe in a holder that contains a sponge which has been moistened with distilled water.
- III. Allow time for the probe to "warm up" and for the air in the probe holder to become saturated with water vapor.
- IV. Set the *altitude* on the meter.
- V. The probe will now be calibrated to 100% saturation.
- VI. Set the *salinity* of the water sample that you want to measure on the meter.
- VII. Put the probe into the water sample and gently move it from side to side.



VIII. Wait until the reading on the meter becomes stable, and then record the result.

The methods of calibration can be very similar for different types of dissolved oxygen meters, but you should always check the user manual for the specific dissolved oxygen meter you are using for the correct way to calibrate it.

2. P^H meter

Description-A pH meter is used to measure the *pH* in water. It consists of a probe and a meter. The probe is lowered into the water sample and the pH of the sample will be displayed on the meter.



Calibration-Follow these steps to calibrate a pH meter:

- Turn the meter on.
- Connect the probe to the meter.
- Place the probe in *buffer 7* solution and wait for the reading to stabilize.
- Press the "Cal" button to enter the calibrate mode.
- Press the "Con" button to set the meter to pH 7.
- This method can be repeated for a buffer 4 and/or a buffer 10 solution.
- Press the "Meas" button and Measure will appear on the display screen.
- Rinse the probe with distilled water.
- The pH meter is now calibrated and ready for use.

The methods of calibration are very similar for most pH meters. However, you should always check the user manual for the meter you are using to find out how to calibrate it.

Use-To use the pH meter:

- place the probe in the sample to be measured
- wait for a stable reading to appear on the meter
- Record that reading.

3. Salinity meter

Description-A salinity meter is used to measure the *salinity* of water.

A salinity meter has a probe that detects the salinity of a water



sample,



and a meter that displays the salinity of the water in parts per thousand.

Calibration-Most salinity meters don't require calibration. However, some salinity meters require the temperature of the water sample to be set on the meter before it can measure the salinity of the water sample.

Use-To use a salinity meter:

- insert the probe into the water sample so that the probe is completely submerged
- allow time for the reading on the meter to become stable
- Record the value of the reading on the meter once it stops changing.



4. Thermometer

A thermometer is used to record the *temperature* of water. To use it, lower the thermometer into the water and wait a minute or two. Then take the thermometer out and read the temperature recorded on it.

5. Ammonia test kit

Description and use-An ammonia test kit is used to measure the level of *ammonia* in a water sample. It comes with two separate reagents that are added to the water sample.



To use the ammonia test kit:

- fill the container with the water sample
- add the first reagent to the water sample
- add the second reagent, then wait for the water to change color
- compare the color of the water sample to the color chart that comes with the test kit
- Find the color on the chart that matches the color of the water sample, and take a reading of the value on the chart. This is the amount of ammonia in the water sample.

Safety-Ammonia test kits can contain chemicals that can be harmful to you, to stock, or to the environment. Adopt the following guidelines when using an ammonia test kit:

- Always wear clean gloves when using the test kit.
- Always store used waste reagents in a suitable container for disposal later.



- Avoid contact with skin and eyes.
- Do not swallow reagents.
- Do not smell the reagents.

6. Nitrite test kit

Description and use-A nitrite test kit is used to measure the amount of nitrite in a water sample. The test kit often comes with two reagents and a sampling container.



To use the nitrite test kit:

- fill the container with the water sample
- add the first reagent to the water sample
- add the second reagent and wait for the sample to change color
- compare the color of the water sample to the color chart that comes with the test kit
- Find the color on the chart that matches the color of the water sample, and take a reading of the value on the chart. This is the level of nitrite in the water sample.

Safety-Nitrite test kits can contain chemicals that can be harmful to you, to stock, or to the environment. Adopt the following guidelines when using a nitrite test kit:

- Always wear clean gloves when using the test kit.
- Always store used waste reagents in a suitable container for disposal later.
- Avoid contact with skin and eyes.
- Do not swallow reagents.
- Do not smell the reagents.
- Secchi disk

The secchi disk is basically a painted disk attached to a length of cord, or a rod. It is used to measure the *turbidity* of water. The cord or rod is often graduated so that the depth the disk has sunk to can be measured.



To use a secchi disk:

- I. hold the cord or rod and slowly lower the disk into the water
- II. keep lowering the disk until it is just no longer visible



- III. note the depth of the disk by checking where the water level is on the cord or rod
- IV. Record this depth.

Self-Check 2	Written Test
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Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. Write the functions of pH meter, Ammonia test kit, thermometer, Dissolved oxygen meter? (15 points)

Note: Satisfactory rating - 15 points Unsatisfactory - below 15points

6Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

Short Answer Questions

Information Sheet-02	Using manuals during loading and unloading materials
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During fish loading and unloading the following are required ;

- Fish handling equipments will be ready
- The vehicles will required a cooling facilities since fish are highly perishables products
- Inside of the vehicles shall be clean and neat to avoid contaminations
- If possible unwanted parts of fish first removed before transportation to the processing site



- Add preservatives if the journey is too long
- Fish shall be inside the materials no contact with the vehicles
- If the fish is transported by draft animal or a person it shall be removed the gut and using salt for preservatives.

Self-Check 3	Written Test
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Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. What are the requirements during of loading and unloading ? (5 points)
2. What do we do before loading of fish ? (7 points)

Note: Satisfactory rating - 13 points Unsatisfactory - below 13 points

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

Short Answer Questions

Information Sheet-03	Selecting and checking personal protective equipment (PPE)
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- Using appropriate Personal Protective Equipment (PPE);-It is important to reduce the possible hazard at work operation. Personal Protective Equipment (PPE) The equipment designed to protect handlers from injury. This equipment should be selected based on the procedures to be accomplished, referring to manuals or supervisors if in doubt of its appropriateness.

PPE commonly includes

- ❖ Aprons



- ❖ Gloves [rubber or latex to protect from caustic or toxic substances, leather or canvas to protect from abrasion, disposable plastic to maintain bio-security];
- ❖ Boots [heavy leather or rubber for protection and disposable plastic for bio-security];

Self-Check 4	Written Test
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Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. What is the purposes of PPE? (5 points)

2. Write some PPE ? (5 points)

Note: Satisfactory rating - 10 points Unsatisfactory - below 10 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____







Short Answer Questions

Information Sheet-04	Providing work support according to occupational health and safety (OHS)
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Many workers in the Agriculture and Fishing industry get injured every year because they fail to observe correct workplace health and safety procedures. This topic provides information to help you keep your work place free from injury.



Hazard Signs - What do them mean in the next table:

Sign	Description	Examples
	<p>Explosives are materials that have very fast chemical reactions. They release large quantities of gas in the form of an explosion.</p>	<p>Ammunition, fireworks, and flares.</p>
	<p>Flammable gases can burn when they come into contact with oxygen or a source of heat. In some conditions they can even explode! Since these gases can burn they cause other normally non-hazardous materials to burn.</p>	<p>Methane, acetylene, and propane.</p>
	<p>Non-flammable and non-toxic gases are non-flammable and non-poisonous.</p>	<p>Nitrogen, oxygen and medical air.</p>
	<p>Also called poison gases, toxic gases are dangerous because they can mix with air and can easily enter the lungs to make you very sick or even kill you. Some poison gases can also be absorbed through the skin.</p>	<p>Carbonmonoxide, chlorine, ammonia, and hydrogen sulphide.</p>
	<p>Flammable liquids are liquids that can burn. Once flammable liquids burn, they can cause other substances to burn.</p>	<p>alcohols, methylated spirits and solvents.</p>
	<p>Flammable solids burn very easily. All it takes is a bit of exposure to a heat source. Even friction can cause these solids to burn. Flammable solids come in powdered, granular, or pasty form.</p>	<p>Safety matches, camphor, and naphthalene.</p>



	<p>Spontaneously combustible substances can burn by themselves, without being exposed to a heat source. Because of this, they can cause other materials to burn.</p>	<p>White phosphorous.</p>
	<p>There are certain substances that are classified as dangerous when wet. When these substances come in contact with water they can give off flammable gases that can explode.</p>	<p>Calcium carbide and sodium.</p>
	<p>Oxidizing substances are chemicals that contain one or more oxygen atoms. They are not particularly hazardous on their own but become dangerous when mixed with other hazardous chemicals.</p>	<p>Hydrogen peroxide, calcium hypochlorite (pool chlorine), and ammonium nitrate.</p>
	<p>Also called poisonous substance, toxic substance are products and materials that can make you very ill or even kill you. Many substances found in workplaces are poisonous.</p>	<p>Pesticides (not most herbicides), heavy metal products, and rat poison.</p>

<p>Self-Check 6</p>	<p>Written Test</p>
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Name: _____ **Date:** _____

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. What is meant to be OHS ? (5 points)
2. What is the purposes of putting sign in work places ? (5 points)

Note: Satisfactory rating - 10 points Unsatisfactory - below 10 points



Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions