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DepED
DEPARTMENT OF EDUCATION

Technology and Livelihood Education

Agri-Fishery Arts

Module 10: Fish Culture

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ADM

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Technology and Livelihood Education

Agri-Fishery Arts

Module 10: Fish Culture

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Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.

What I Need to Know

This module was designed and written with you in mind. It is to help you master the nature of Technology and Livelihood Education. The scope of this module permits it to be used in many different learning situations. The language used recognizes the diverse vocabulary level of students. The lessons are arranged to follow the standard sequence of the subject or learning area. But the order in which you read them can be changed to correspond with the textbook you are now using.

This module in Agriculture is all about Fish culture.

After going through this module, learners are expected to:

Conduct a Survey to find out:

1. persons in the community whose occupation is fish culture;
2. kinds of Fish being cultured or raised as means of livelihood
3. possible hazard cause by fish culturing or raising to the people and community
4. ways to prevent possible hazards brought about by culturing or raising fish
5. market demands for fish product and by-products
6. direct consumers and retailers
7. benefits that can derived from fish culturing
8. stories of successful entrepreneurs in animal/fish raising.

What I Know

Direction: Choose the letter of the correct answer. Write your answer in a separate sheet of paper.

1. It is the business or industry of producing fish through husbandry and is synonymous to fish culture.
    a. Animal Breeding
    b. Fish Farming
    c. Juvenile Farming
    d. Grow-out Farming

2. It is a system of farming system which involves very high stocking density and fish are fed wholly with formulated feed.
    a. Extensive Fish Farming System
    b. Integrated Aquaculture System
    c. Intensive Fish Farming System
    d. Semi-intensive Fish Farming System

3. This culture system also includes rice-fish integration, horticulture-fish system, mushroom-fish system, and Seri-fish system.
    a. Extensive Fish Farming System
    b. Integrated Aquaculture System
    c. Intensive Fish Farming System
    d. Semi-intensive Fish Farming System

4. A desirable fish species to culture for its herbivorous feeding habit, which reduces production cost but has rapid growth rate compared to other herbivorous fishes thus giving more profit to the farmer.
    a. Catfish
    b. Grouper
    c. Milkfish
    d. Tilapia

5. Which are examples of fishery products that are cultured?
    a. Clownfish and Puffer fish
    b. Milkfish and Tilapia
    c. Mantis shrimps and soles
    d. Yellow fin tuna and Sardines

6. What makes milkfish a desirable species to culture?
    a. It has slow growth rate.
    b. It has a carnivorous feeding habit.
    c. It has no tolerance to a wide range of salinity.
    d. It is shiny and with attractive appearance.

7. Which of the following are the reasons why many people culture tilapia?
    a. It is easy to raise, slow-growing fish, can survive any bodies of water and environment.
    b. It is easy to raise, fast-growing fish, can survive any bodies of water and environment.
    c. It is easy to raise, slow-growing fish, can't survive any bodies of water and environment.
    d. It is easy to raise, fast-growing fish, can't survive any bodies of water and environment.

8. Although beneficial to people, fish culture also poses adverse impacts on environment, people and the community. Which of these impacts is caused by conversion of agricultural land to ponds?
    a. Decline in local food crops
    b. Displacement of native species
    c. Loss of mangrove ecosystem
    d. Water and soil salinization

9. Overfishing can endanger the population of stocks of some species in the wild. How does fish farming help in preventing the depletion of wild stocks from the sea?

    a. Fish farming provides more hiring possibilities and more jobs.
    b. Fish farming provides extra income to supplement the earnings of the family.
    c. Fish farming provides alternative sources of fish instead of fishing the same species from the sea.
    d. Fish farming buffer zones that protects the rest of the sea from pollution.

10. Which of the following statement is a way to prevent possible hazard brought about by fish culture/farming?

    a. chemical toxicity - because of the use of pesticides and antibiotics
    b. decline in local food crops - because of conversion of agricultural land to ponds.
    c. sustainable use of sea resources – aquaculture provides opportunities to replenish stocks in the wild
    d. use of proper site evaluation and design procedures

Lesson 1

Fish Culture

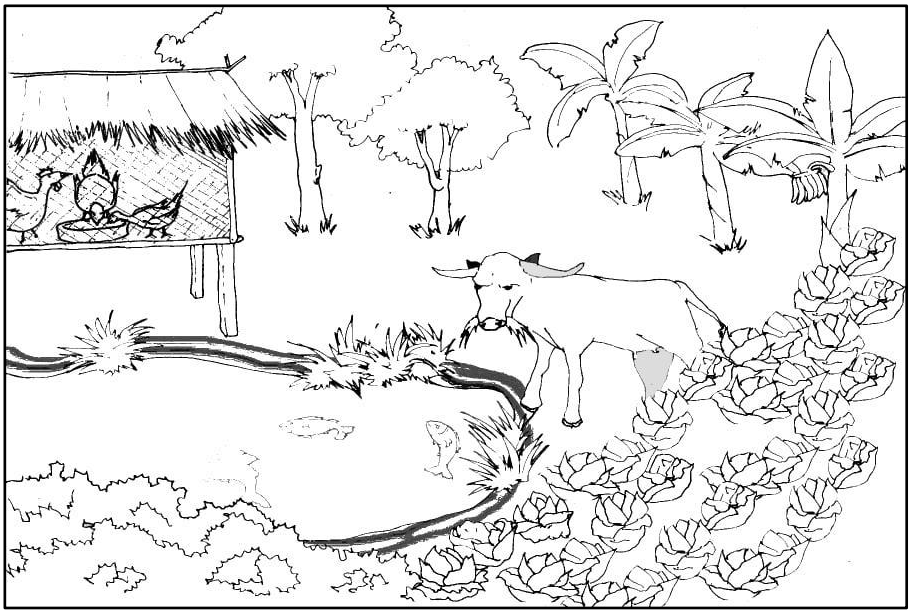
[1]A private fish farm on the backwaters

Fish farming is the raising of fish for personal use or profit. It is sometimes called fish culture. By raising fish we make better use of our land and our water. If you raise fish your family will have more to eat. The protein in fish will keep your family strong and healthy. Fish are tasty, like chicken, sheep, and goat. If your family is not too big, you will have more fish than you need for food and you can sell them at the market. With more food and more money you and your family can live better.

[1] Shankar S., Free Royalty, https://www.flickr.com/photos/shankaronline/28766033502

What's In

Direction: Write a simple story describing the picture shown by using the words listed below the picture. Put a check on the lines across each word that is already used.



Words to Use:

fish	___	people	___
farming	___	livelihood	___
animals	___	consumers	___
harvest	___	benefits	___
market	___	successful	___

_____
_____
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What's New

Direction I: Conduct a survey of the persons in the community whose occupations are fish farming. Ask the assistance of your parent or older siblings in collecting the needed data by using the survey questionnaire below. Keep a record of the data you collected in a separate sheet of paper.

Survey Form

Name of the Farmer: _____
Address : _____

Seq.	Survey Questions	Response
1	Has this household ever raised fish? (current or past)	
2	Did this household have an existing fishpond?	
3	Have you sold fish for income?	
4	Approximately how much of your total household income is from selling farmed fish?	
5	Where or to whom do you market your fish products?	
6	Approximately how long have you raised fish?	
7	How many times do you produce farmed fish every year?	
8	What species/types of fishes do you raise?	
9	What type of feeds do you give to your fishes?	
10	What benefits do you get from fish farming?	
11	How did you solve problems in order to improve your fish farming business?	
12	Will you encourage your friends and family to venture into fish farming? Why?	

What is It

Fish Farming

Fish farming is the business or industry of producing fish through husbandry and is synonymous to fish culture. In broader terms, fish farming is a part of aquaculture, which deals with the culture of plants and animals in water. The farming of fish includes breeding, rearing of the young and the grow-out of juvenile fish to adult or harvestable fish.

Fishes are cultured in freshwater, brackish water and seawater for food, recreation, and other purposes. Suitable fishes for culture are those that can easily be bred, grow fast, and have a good market. Species that are hardy and can tolerate crowding are also preferred.

There are different types of farming systems being practiced:

Extensive Fish Farming System

- least managed form of fish farming
- fish depends only on natural food
- large ponds measuring 1 to 5 ha in area
- stocking density limited to only less than 5000 fishes/ha.
- no supplemental feeding or fertilization of water provided
- yield (500 to 2 ton/ha), and survival is low.

Semi-intensive Fish Farming System

- involves rather small ponds (0.5 to 1 hectare in an area)
- with higher stocking density (10000 to 15000 fish/ha).
- care is taken to develop natural foods by fertilization with/without supplemental feeding. However, the major food source is natural food.
- yield is moderate (3 to 10 ton/ha)

Intensive Fish Farming System

- highly managed form of fish farming
- involves small ponds/tanks/raceways
- with very high stocking density (10-50 fish/m3 of water)
- fish are fed wholly with formulated feed.
- control of water quality by use of aerators
- control of feeding by use of commercial feed.
- yield is high 15 to 100 ton/ha or more

Integrated Aquaculture System

- fish culture is integrated with agricultural crops such as rice, banana and coconut, thereby producing fish and agricultural crops.
- includes rice-fish integration, horticulture-fish system, mushroom-fish system, Seri-fish system.

Persons in the Community Whose Occupation is Fish Culture

Fish culture contributes more than half of the total volume of production of fish in the Philippines. Western Visayas remains the fourth largest contributor in the national volume of production of fish from year 2014 up to 2018.

Many entrepreneurs in the region are into fish culture. Some of them are:

1. Thomas Hautea – owns Retcem Resources Incorporated Fish Farm which operates a number of milkfish farms in different towns of Iloilo Province.
2. Eric Ledesma – owner of a milkfish farm named Iloilo Farm at Brgy. Tubigan, Zarraga, Iloilo
3. Francisco Blas, Jr. – owner of Flanton Aqua Farm raising milkfish at Brgy. Poblacion, Ajuy, Iloilo
4. Teresita A. Yusay – owner of T.A.Y Farm who raise giant tiger prawn or "lukon" at Brgy. Calumangan, Bago, City, Negros Occidental.
5. Juanito Ang – owner of Bayshore Aquaculture Farm raising prawns at Brgy. Palaka Norte, Pulupandan, Negros Occidental.
6. Dan L. Gayares – owns a prawn and tilapia fish farmat Purok Gumamela, Brgy. Calumangan, Bago City, Negros Occidental.
7. Eugenio V. Lacson – a white shrimp (*P. vannamei*) raiser in Banago, Bacolod City, Negros Occidental
8. Joselito Baba – owner of Puffi Aquaculture Farm raising prawns and white shrimps at Sitio Buhi-an, Brgy. To-oy, Himamaylan City, Negros Occidental
9. Nicanor Gamboa – owner of Nicanor Gamboa farm and a milkfish farmer in Madalag, E.B. Magalona, Negros Occidental.
10. Rustico Gustilo – owner of Gustilo Marine Products and a milkfish and crab raiser in Brgy. Cawayan, Carles, Iloilo

Kinds of Fish being Cultured as Means of Livelihood

Milkfish and Nile tilapia are the major fishes now produced but groupers, sea bass, rabbit fish, red snappers, carps, and catfishes are grown by some farmers.

1. [2]**Milkfish** (*Chanos chanos*)

Milkfish is the national fish of Philippines and it is known locally as 'bangus.' Milkfish is a delectable fish which grows fast and can tolerate a wide range of salinity.

The culture of milkfish in brackish water ponds and pens is an age-old and traditional practice in many tropical countries such as Philippines. It is farmed in freshwater ponds, lakes, reservoirs, and marine cages. Many important characters make Milkfish a desirable species to culture:

- Herbivorous feeding habit, which reduces production cost and gives more profit to the farmer.
- Rapid growth rate compared to other herbivorous fishes.
- Readily acceptance of formulated pellet feed under culture conditions.
- Easy culture practice with other cultivable species like Shrimps, Mullet, Tilapia, and Carps, etc.
- Due to its non – cannibalistic nature, stocking density can be high in culture conditions compared to other finfishes.
- Tolerance of wide range of salinity makes them suitable to culture in different salinity.
- Shiny, attractive appearance makes it potential live bait in the tuna industry.

2**.** [3]**Tilapia** (*Oreochromis niloticus*)

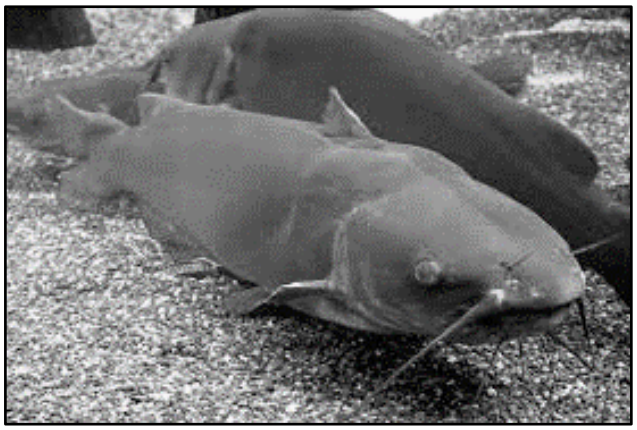
Tilapia is a good fish for culture, it can be breed in ponds, cages, or fish pens. It feeds voraciously on most natural food like planktons, bottom biota present in ponds, but prefer vegetative foods.

Tilapia is a common name for nearly 100 species of tilapia used in culturing fish. Many people culture tilapia because it is easy to raise and it is a fast-growing fish and can survive in any bodies of water either in seawater or in freshwater and any type of environment.

[2] Bernard Spragg. NZ, Free Royalty, https://www.flickr.com/photos/volvob12b/18418215776

[3] Silver and orange fish on ice, Free Royalty, https://www.pikrepo.com/fxpma/silver-and-orange-fish-on-ice

3. [4]**Catfish** (*Clarias batrachus*)



Clarias batrachus is a black, slippery fish with mustache to aid it in swimming. It is called *catfish* in English, *hito* in Ilocos, *ito* in Pampanga, and *pantat* in Pangasinan, Cebu and Iloilo. Catfish are resistant to diseases, can be stocked at high densities, and tolerates low water quality. Catfish are usually found in marshes, rice fields, swamps, streams, rivers, lakes irrigation canals, or in any body or fresh water.

Catfish are carnivores, but can feed on small bottom dwelling animals, rice bran, kitchen refuse, fish meal, or formulated feeds.

4**.** [5]**Grouper** (*Epinephilus spp.)*

Groupers, popularly known as "lapu-lapu" in some Philippine dialects, are important marine fishes. They are characterized by thick-set or stout bodies, slightly elongate with brown spots or blotches. They also have very large mouths and normally protruding lower jaw. It is, however, difficult to differentiate one species from another due to the fishes' ability to change its colors.

Groupers are cultured in the Philippines using tiny fry and juveniles caught from the wild. Fish farmers grow them in net cages and in ponds. Grouper culture can result in high productivity and profitability. Grouper farming could therefore become another dollar earner for the country as live marketable size grouper have strong export potentials. The demand for grouper in the international market is fast growing, particularly in Hong Kong, Japan, and Singapore.

Possible Hazard Cause by Fish Culture to the People and Community

Fish culture provides many benefits to people, mostly through access to a large production of nutritious, high-quality foods. However, as with land agriculture, it also poses adverse impacts on environment, people and the community, especially when culture systems are intensive.

[4] Ryan Somma, Free Royalty, https://www.flickr.com/photos/ideonexus/3634418206/

[5] Dollar fish or grouper, Free Royalty, Cropped, https://commons.wikimedia.org/wiki/File:Dollar_fish_or_grouper.jpg

Some of these are:

- Pollution (inside and outside pond system) - due to excessive feed wastes settled inside the pond or discharged untreated to ocean waters.
- Chemical toxicity - because of the use of pesticides and antibiotics
- Displacement of native species - because importation of foreign species
- Decline in local food crops - because of conversion of agricultural land to ponds.
- Competition for credit, land, and other resources
- Gradual sinking of the culture land area
- Spread of parasites and diseases
- Loss of mangrove ecosystem
- Water and soil salinization
- Public health risks

Ways to Prevent Possible Hazards Brought about by Culturing Fish

Effective methods in reducing the impacts of fish culture include but are not limited to:

- use of proper site evaluation and design procedures
- good construction practices
- attention to erosion control
- lower stocking rate and commercial feeding rate
- proper management techniques.
- maintaining good water quality conditions
- keeping the culture facility clean and well organized
- adoption of sustainable culture techniques

Market Demands for Fish Product and By-products

Fish is consumed as fresh, fermented, dried, smoked or canned. Around 70 percent of the total catch is consumed fresh or chilled, while 30 percent is processed into cured, canned, or frozen products, or disposed of live. The bulk of cured fish and fishery products are consumed locally, while only a small quantity is exported as ethnic products.

Most of the aquaculture products are either auctioned on site or transported to major fish ports for auctioning. On-site bidding is done by middlepersons and fish exporters. Bidding in fish ports is typically done by middlepersons, fish vendors in the local wet markets and small fish processors. Some aquaculture farms have their own processing facilities. Hence, most of their aquaculture products directly go to their processing plants.

Traditional processed fish products (e.g. smoked, dried, salted, fermented and marinated/pickled) are sold in wet markets throughout the country. Some products are sold in supermarkets, including canned/bottled fish, deboned milkfish, and specialty products (e.g. pasteurized fish paste, crab fat). In terms of export, Japan and USA are the traditional export markets for Philippine fish and fishery products.

Direct Consumers and Retailers

Types of buyers according to characteristics and functions:

Types of Buyers	Characteristics and Functions
Retailers	middlemen who sell their fish purchases to the ultimate consumers, mostly in retail markets
Buyer-sellers	wholesalers but are differentiated from them as operating within the confines of the fish-landing area
Institutional buyers	buying fish for consumption in such institutions as hospitals, restaurants, etc.
Processors	buy in bulk for processing into salted dried fish, tinapa, fishmeal, etc.
Exporters	buy fish for export to foreign market
Canners	buy fish for canning
Final consumers	buy fish for household consumption

National government agencies like the Department of Agriculture has efforts to rollout more *Kadiwa* mobile markets throughout the country wherein the consumers are given an opportunity to directly buy fresh fruits and vegetables, fish and other fishery products, fresh and frozen meat and poultry products, as well as some dry goods, right at the premises of their barangays.

Benefits that can Derived from Fish Culturing

Benefits derived from fish culture are:

1. Alternative food source - fish and other seafood are good sources of protein and have more nutritional value like the addition of natural oils into the diet.
2. Increased jobs in the market – aquaculture provides more hiring possibilities and more jobs.
3. Reduce fishing of the wild from the sea- allow for alternative sources of food instead of fishing the same species in their natural habitats. Population numbers of some wild stocks of some species are in danger of being depleted due to overfishing.
4. Sustainable use of sea resources – aquaculture provides opportunities to replenish stocks in the wild.
5. Entrepreneurship-provides extra income to supplement the earnings of the family.

Stories of Successful Entrepreneurs in Fish Raising

Fish farming is a lucrative business. Some of the most notable entrepreneurs in this venture are the following:

1. Robert Petines

Robert Petines is a successful fish grower of tilapia in Cagayan Valley. In 1980 he was given a prestigious award as "NATIONAL SAKA AWARDEE." The Fish Industry also gave him the "Fish for Every Filipino Award" for his great contribution to the fish industry. The Bureau of Fisheries and Aquatic Resources supported him when he adopted the "Sex Reversed Tilapia Production" and because of that, he is now considered as the most successful tilapia raiser in his region.

2. Audie Lim

Audie Lim is a successful bangus grower in Ozamiz City. He has also a fish farm in Silay City, Lanao, Pangasinan and other part of the Philippines. Audie Lim has never had a formal knowledge of aquaculture. But his name spreads fast among serious intensive milkfish aquaculturists. Aside from the Ozamiz market, they also sell to other cities as well. Now they regularly bring a major portion of their fish to Navotas fishing port.

3. Mr. Vicente "Dodong" Lugagay

A 53-year-old ordinary fish farm worker quit his job a few years ago and put up his own tilapia hatchery in Brgy. Rizal, Santiago City in Isabela. Through hard work and smart business sense, he became successful and was named the 2018 Gawad Saka winner in the Fish Culture Category. He received P300,000.00 in prizes from the national and regional levels. Of course, that's peanuts compared to his income from the sales of his tilapia fingerlings.

The fellow is Vicente B. Lugagay, whose JAVE Farm produces 300,000 to 500,000 fingerlings a month, which are sold not only in Isabela, but also in other places in Nueva Vizcaya, Cagayan, Pampanga, and the Cordillera Administrative Region. Lugagay won his national and regional awards because of the practical and innovative technologies he has adopted in running his tilapia hatchery.

What's More

Independent Activity 1

Direction:
1. You are given words written in scrambled letters inside the box below.
2. Form these words correctly in order to answer the questions asked in the independent assessment

S I F A C H T	R R O U G E P
L P A I T A I	T A E R L IE R
K I L I M S F H	

Independent Assessment 1
Direction: Use the word formed from the scrambled letters above to answer the following questions using a separate sheet of paper:

_____ 1. Middlemen who sell their fish purchased to the ultimate consumers, mostly in retail markets.
_____ 2. They are characterized by thick-set or stout bodies, slightly elongate with brown spots or blotches.
_____ 3. It is usually found in marshes, rice fields, swamps, streams, rivers, lakes irrigation canals, or in any body or fresh water.
_____ 4. A delectable fish which grows fast and can tolerate a wide range of salinity.
_____ 5. It feeds voraciously on most natural food like; planktons, bottom biota present in ponds, but prefer vegetative foods.

Independent Activity 2
Directions: To help you remember important ideas about fish culture, you are given the following statements that may either be a benefit, possible hazard or way to prevent possible hazards in fish farming. Be familiar with them and answer the questions that follow.

A. alternative food source
B. decline in local food crops
C. displacement of native species
D. proper management techniques
E. sustainable use of sea resources
F. provides extra income of the family
G. maintaining good water quality conditions
H. adoption of sustainable culture techniques
I. keeping the culture facility clean and well organized
J. chemical toxicity due to the use of pesticides and antibiotics

Independent Assessment 2

Directions: From the sentences given above choose any 2 statements to reflect on the importance of balancing the benefits derived from fish culture with the possible hazards it poses to the people or community and the ways that may prevent such hazards. Write the letter of your answer on a separate sheet of paper.

Benefit Derived from Fish Farming	Possible Hazard Caused by Fish Farming/Culture	Ways to Prevent Possible Hazard in Fish Farming
1.	3.	5.
2.	4.	6.

Independent Activity 3

Direction: You are given below the different farming systems being practiced by fish raisers in any community. Use these practices to answer the questions ask in the assessment.

A. Extensive Fish Farming System

B. Semi-intensive Fish Farming System

C. Intensive Fish Farming System

D. Integrated Aquaculture System

Independent Assessment 3

Direction: From the different fish farming practices written inside the box above match it with the descriptions given as independent assessment:

Seq	Description of any Type of Fish Farming Practices	Type of Fish Farming being Practiced
1	Least managed form of fish farming, supplemental feeding or fertilization of water provided	
2	Includes rice-fish combination farming system, horticulture-fish system, mushroom-fish system, and Seri-fish system.	
3	Involves small ponds/tanks/raceways, with very high stocking density (10-50 fish/m3 of water)	
4	Care is taken to develop natural foods by fertilization with/without supplemental feeding. However, the major food source is natural food.	
5	Highly managed form of fish farming, Fish are fed wholly with formulated feed.	

What I Have Learned

Show what you have learned by completing the sentence or filling the needed information in the blanks provided to process your understanding.

_____ is the business or industry of producing fish through husbandry, a part of aquaculture, which deals with the culture of plants and animals in water.

Fishes are cultured in what kind of water for food, recreation and other purposes? _____, _____, and _____.

_____ farming system that involves rather small ponds (0.5 to 1 hectare in an area with higher stocking density (10000 to 15000 fish/ha).

_____ a desirable species to culture for its herbivorous feeding habit, which reduces production cost and gives more profit to the farmer.

_____ is a good fish for culture, it can be breed in ponds, cages, or fish pens. It feeds voraciously on most natural food; like planktons, bottom biota present in ponds, but prefer vegetative foods.

There are different types of farming systems being practiced; name these fish farm culture practices. _____, _____, _____, _____.

What I Can Do

From the survey you have conducted earlier in his module, narrate the data you gathered by answering the questions below. Write your answer in a separate sheet of paper.

1. Who are the people in your community whose occupations are fish culture? Name a least two.
2. What are the types of fishes are they raising?
3. To whom or to where do fish farmers in your community sell their products?
4. What problems did these fish farmers encounter in their fish farming business?
5. How did they manage to solve their problems and improve their business?
6. Do you this fish culture is a profitable business and worthwhile occupation? Why?

Assessment

Multiple choice. Choose the letter of the best answer. Write the chosen letter on a separate sheet of paper.

1. It includes breeding, rearing of the young and the grow-out juvenile fish to adult or harvestable fish.
    a. Animal Breeding
    b. Fish Farming
    c. Grow-out Farming
    d. Juvenile Farming

2. It is a system of farming system which involves higher stocking density applies fertilizer to develop natural food in the pond.
    a. Extensive Fish Farming System
    b. Integrated Aquaculture System
    c. Intensive Fish Farming System
    d. Semi-Intensive Fish Farming System

3. In this culture system, fish is produced together with other agricultural products like rice, banana or coconut.
    a. Extensive Fish Farming System
    b. Integrated Aquaculture System
    c. Intensive Fish Farming System
    d. Semi-Intensive Fish Farming System

4. Which are NOT examples of fishery products that are being cultured?
    a. Clownfish and Puffer fish
    b. Milkfish and Tilapia
    c. Oysters and Mussels
    d. Prawns and Shrimps

5. Which is NOT true about milkfish?
    a. carnivorous feeding habit
    b. rapid growth rate
    c. shiny and with attractive appearance
    d. tolerance of wide range of salinity

6. These are the reasons why many people culture tilapia.
    a. It is easy to raise, slow-growing fish, can survive any bodies of water and environment.
    b. It is easy to raise, slow-growing fish, can't survive any bodies of water and environment.
    c. It is easy to raise, fast-growing fish, can't survive any bodies of water and environment.
    d. It is easy to raise, fast-growing fish, can survive any bodies of water and environment.

7. Why is mud crab fattening the most suitable method for small scale aquaculture?
    a. Cannibalism is dramatically increased.
    b. Lower survival rate for fattening.
    c. Fattened crabs can be stocked at lower densities.
    d. The period between investment and returns is short.

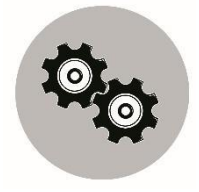
8. Although fish culture provides many benefits to people, it also poses adverse impacts on environment, people and the community. Which of these impacts is caused by importation of foreign species for farming?
    a. decline in local food crops
    b. displacement of native species
    c. loss of mangrove ecosystem
    d. water and soil salinization

9. Population numbers of some wild stocks of some species are in danger of being depleted due to overfishing. How does fish farming help in the preventing the depletion of wild stocks from the sea?

    a. Fish farming provides more hiring possibilities and more jobs.
    b. Fish farming provides extra income to supplement the earnings of the family.
    c. Fish farming provides alternative sources instead of fishing the same species from the sea.
    d. Fish farming buffer zones that protects the rest of the sea from pollution from the land.

10. The culture of this fish in brackish water ponds and pens is an age-old and traditional practice in many tropical countries. Due to its non – cannibalistic nature, stocking density can be high in culture conditions compared to other finfishes.

    a. Catfish
    b. Groupers
    c. Milkfish
    d. Tilapia



Additional Activities

Surf the internet for more information about the best practices on the different systems of fish culture practiced in the country and abroad. Record your notes in your EPP notepad.

Answer Key

What I Know

1. B
2. C
3. B
4. C
5. B
6. D
7. B
8. A
9. C
10. D

What's More

Independent Assessment 1

RETAILER

GROUPER

CATFISH

MILKFISH

TILAPIA

Independent Assessment 2

1 & 2. A, E & F

3 & 4. B, C, & J

5 & 6. D, G, H & I

Independent Assessment 3

1. A

Assessment

B
D
B
A
A
D
D
B
C
C

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