
**Teaching Methodology for
Agricultural Life Skills Education
for
Teacher Training Centers**

Part 2 Fish Raising

2013

Unofficial translation

Teaching Methodology for Agricultural Life Skills Education for Teacher Training Centers Part 2 Fish Raising

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Preface

Implementation of life skills in agriculture is currently very attractive in the educational sector globally.

Starting from this context, strengthening life skills in agriculture related to daily livelihood is truly essential for student teachers and students in the present and future.

Therefore, in order to understand life skills, teachers who teach agricultural life skills should:

1. Understand the content and objectives, and know how to use materials.
2. Prepare adequate materials for each recommended activity.
3. Pre-practice by themselves before teaching in classes.

I hope all teachers will pay attention to use these materials for teaching and learning in order to improve education.

On behalf of the Ministry of Education, Youth and Sport, I profoundly thank the working group and VVOB's project technical assistance for compiling all documents.

Phnom Penh, 17 June 2013
Minister of Education, Youth and Sport

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The Household Fish Raising Manual is prepared in cooperation with the Ministry of Education, Youth and Sport and VVOB.

This book is prepared in order to explain about fish raising techniques using natural methods. It covers theories and practices in each lesson. The book will make fish raising easier and it requires less money, furthermore it is promoting quality of health and environment education in our country.

Even though agriculture experts provided technical assistance and materials and a big effort was made to do research of relating documents for this manual, the content may not be complete for teachers to teach their students. However, this manual is a guide for teachers to do more research and prepare lesson plans to fit the actual needs. We hope that this document will enable teachers to prepare teaching materials more effectively. We look forward to seeing your constructive comments and suggestions.

Authors Group

Note

This is the translation of វិធីបង្រៀនការអប់រំបំណិនជីវិតស្តីពីកសិកម្ម ផ្នែកទី ១ ការចិញ្ចឹមត្រី (the training manual Teaching Methodology for Agricultural Life Skills Education for Teacher Training Centers Part 2 Fish Raising) which was issued in 2013 by the Ministry of Education, Youth and Sport (MoEYS). This translation was made by VVOB (the Flemish Association for Development Cooperation and Technical Assistance and is not an official translation. We hope it may be useful to External Development Partners of MoEYS and Teacher Training Centers who wish to consult the original Khmer manual in English.

INTRODUCTION TO TEACHING METHODOLOGY FOR AGRICULTURAL LIFE SKILLS

This Agricultural Life Skills Teaching Manual is a tool to provide agriculture life skills lessons to future teachers. The manual consist of three parts:

- Part 1: Chicken raising
- Part 2: Fish raising
- Part 3: Organic vegetable gardening.

Together with the Agricultural Life Skills Content Manual and accompanying teaching aids, this set provides you a range of ideas and methods that are suitable for your agriculture lessons.

The lessons in this book provide ideas to practice skills of fish raising. By using hands-on practice and experiential based learning as the main methodology, student teachers learn how to apply these methodologies with students in their future primary schools.

The lessons promote a deeper understanding of issues related to family scale fish raising, develop skills for problem solving, decision making, persuading and critical thinking. They also provide opportunities for raising awareness of the existence of agricultural problems and ideas for actions which can lead to behaviour change to avoid these problems, for example changing to raising fish in a natural way, both in a pond and a plastic hole by using available natural food in the community, applying natural ways of preventing diseases.

Definition of Life Skills

'The intellectual, personal, interpersonal and vocational skills that enable informed decision-making, effective communication, and coping and self-management skills that contribute to a healthy and productive life to ensure successfully solving daily problems'.

Policy for Curriculum Development 2005-2009,
MoEYS

Objectives of agricultural education

According to the training-program for primary-level teachers, taken from the MoEYS curriculum agricultural education aims for students to:

- Obtain knowledge, life skills for daily livelihood; for example, skills in planting crops and farming animals to enhance families' living standards.
- Grasp skills and methodologies to impart them to primary school students through practice and experiment.
- Change the attitude and address social and economic challenges through life skills, problems solving skills, thinking skills, decision making skills, cooperation and accountability.

Student centred approach

This teaching manual provides ready to use methods and activities, accompanied by teaching aids such as posters, pictures, videos, materials for experiments. Important in all teaching activities is to apply a student centred approach. Examples of activities that motivate students to be involved in the lesson are demonstrative experiments, educational games, creative and performing arts, role play, discussion and debate, learning-by-doing, a survey or small research. All of these approaches can be found in this manual.

The lessons described have clear references to which teaching aids can be used for which activity and refer to paragraphs in the content manual. Activities described in each lesson will take up around 40 minutes of the teaching time, which allows teacher trainers to spend 5 minutes at the beginning and 5 minutes at the end of the lesson to be able to teach the lesson according to the 5 steps of MoEYS.

Definition of Life Skills Education

"Life Skills based education is used to empower young people in challenging situations. It involves an interactive process of teaching and learning, which enables learners to acquire knowledge and develop attitudes and skills to support the adoption of healthy behaviours."

UNICEF

Use of multimedia

Agricultural issues can also be brought inside the class room by video clips, PowerPoint presentations, photos, et cetera and provide different learning opportunities which focus on awareness building and attitude change. Multimedia will provide information only but a discussion afterwards is needed to give more understanding and more meaning to this lesson activity.

The 2 DVDs that belong to this lesson manual provide documentary video clips and clips showing teaching activities described in the lessons. These clips can help the teacher trainer when preparing the lesson. The clip provides a better understanding of how a practical skill should be demonstrated. The clips can also be shown in the lesson to the student teachers when there is no opportunity to practice a certain activity outside the classroom.

Where a video clip is available in a lesson the manual also offers ideas for a follow up activity that allows discussing the topic in class, which might help changing attitudes related to topics that are aimed to change students' behaviour such as promotion of natural ways of fish raising especially in a plastic hole.

References to the 2 DVDs can easily be found by this pictogram.

On Disc 3 you can find PowerPoint presentations and some pictures related to the lessons.

References to Disc 3 can be found by this pictogram.

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CHAPTER 1 FAMILY SCALE FISH RAISING (2 LESSONS)

1.1 Background

Fish meat contains high protein and it is used as additional food instead of meat by many people. Fishermen keep very little amount of fish for daily consumption because they want to sell it as much as possible. While the demand of fish meat is increasing the natural stock of fish cannot keep up, so additional fish productivity is useful and necessary. This can be achieved through applying aquaculture or family scale fish raising.

Family scale fish raising helps

- in adding one more job after the rice field work is finished.
- in reducing expenditure on buying fish from the market.
- in providing protein and nutrient to support people's health.
- in increasing family income generation.
- in decreasing fishing at the natural river areas.
- increase of the stock of natural fish in those areas.
- in decreasing number of migration for working.

1.2 Objectives

At the end of the chapter the student teachers

Knowledge

- can list advantages of family scale and aquaculture fish raising through group discussion, brainstorming questions and matching activity.
- can explain bio-living of 8 different species of fish suitable for family scale fish raising through brainstorming question, presentation/video and hot potatoes game.

Skills

- can present advantages of family scale and aquaculture fish raising through individual work.
- can identify bio-living of 8 different species of fish through answering questions and individual work.

Attitude

- promote advantages of fish raising to other people, families and schools.

1.3 Teaching aids

Lesson 1 Content & pictures cards (on 3 methodologies of raising fish) and a prepared flip chart with the solution of the matching exercise

Lesson 2 PowerPoint presentation on 8 different species of fish on Disc 3 folder 1.4.2, laptop/projector and paper ball made from sheets of paper, each sheet containing 1 question for playing the hot potatoes game.

1.4 Teaching procedure

1.4.1 Lesson 1 Benefits of family scale fish raising

Activity 1: Group work on the benefits of family scale fish raising (20 minutes)

Content book 1.2

- Divide the student teachers into groups of 5 people.
- Ask the student teachers to discuss the benefits of family scale fish raising.
- Ask a representative of one group to present the findings of the group.
- The teacher trainer concludes results of the discussion based on the content of lesson.

Activity 2: Matching pictures of aquaculture with theory (20 minutes)

Content book 1.3

- Cut up the information below so you have 3 separate picture cards and cut the text also in separate cards (available in life skills box).
- Distribute the pictures and the content cards to each group of student teachers.
- The student teachers are asked to match content (extensive aquaculture, semi-intensive aquaculture and intensive aquaculture) with pictures.
- The teacher trainer will check the results of each group then presents the right answers on a flipchart.

A) EXTENSIVE AQUACULTURE
Micro or family sized farming;
Dependence on natural feed;
Only one species of fish is raised, but there is fish of different age or mixed species;
Less yield.

B) SEMI-INTENSIVE AQUACULTURE
Low density fish culture;
Many species of fish are raised, but they are fed on different natural feeds;
Provide less or insufficient amount of feed during the breeding season;
Medium yield.

C) INTENSIVE AQUACULTURE
High density fish culture;
Spread manure and create natural feed;
Raise many mixed species of fish;
Provide sufficient amount of feed for the entire season;
High cost;
High yield, high price.

The diagram illustrates three types of aquaculture systems, labeled A, B, and C, each shown in a cross-section of a pond. System A (Extensive) shows a simple earthen pond with a few fish and a single dollar sign (\$) below it. System B (Semi-intensive) shows a pond with a person on the bank feeding fish, a water wheel, and two dollar signs (\$\$) below it. System C (Intensive) shows a pond with a person on the bank feeding fish, a water wheel, a pump, and three dollar signs (\$\$\$) below it.

Picture 1 Aquaculture – 3 ways

Source: Agromisa; AgrodoK 15, small-scale freshwater fish farming

1.4.2 Lesson 2 Fish species and its biology

Content book 1.4

Activity 1: PowerPoint presentation on 8 different species of fish (25 minutes)

Content book 1.4

- Brainstorming question: Which species of fish are most popular for raising? What are characteristics of their biology?
- Write answers on the blackboard.
- 🎧 Show the different species of fish by using the PowerPoint presentation on Disc 3 folder 1.4.2.

Activity 2: Hot potatoes game (15 minutes)

- The teacher trainer prepares a ball of sheets of paper. Each sheet of paper contains one question. Example questions are provided below. The teacher trainer can add more questions.
- The student teachers stand in a circle either in- or outside the classroom.
- The student teachers pass the ball around until the teacher trainer says “bung!!”. The student who has the ball removes one layer of paper. This student will read the question out loud and tries to answer.
- The same procedure starts again until all the questions of the ball are finished.

Example questions for playing hot potatoes game:

- What is the pH for most fish species?
- Please describe characteristics of the Chhpin fish.
- Please describe characteristics of Tylapia, or Indian Carp, or ...etc....
- Which fish can reproduce in pond?
- Which fish are living in the bottom layer of water?
- Which fish are living in the top layer of water?
- Etc.

CHAPTER 2 POND AND PLASTIC HOLE PREPARATION (6 LESSONS)

2.1 Background

When you want to start digging a place for a fish pond it is important to take into account the different criteria for selecting the best place as well as the best way to dig the hole. When the fingerlings arrive special precautions have to be taken into account too.

2.2 Objectives

At the end of this chapter the student teachers

Knowledge

- know the right place for digging a pond and plastic hole through group discussion, brainstorming questions and a soil quality experiment.
- know how to dig and prepare a pond and a plastic hole before releasing fingerlings correctly through demonstration from the teacher trainer and through practice.

Skills

- can correctly dig a pond and plastic hole.
- can prepare the pond and the plastic hole before releasing fingerlings.
- can correctly select, pack and deliver fingerlings.
- release fingerling step by step through real practice.

Attitude

- are interested in raising fish at school and at home.

2.3 Teaching aids

Lesson 1 Flipcharts

Lesson 2 pH tester, white lime, mud from bottom layer of pond, cow's dung, TuntreanKeth (green plant).

Lesson 3 Hoe, spade and two handle-baskets, video showing "group work selecting location for digging" DVD 1 clip 2.4.3 and video clip "how to dig a plastic hole" DVD 1 clip 2.4.3, DVD player/TV or laptop/projector.

Lesson 4 pH tester, white lime, mud soil from bottom layer of pond, cow's dung, Tuntrean Keth (green plant), plastic, post, net, Azolla.

Lesson 5 Video "How to select, package and deliver fingerlings" DVD 1 clip 2.4.5. DVD player/TV or laptop/projector.

Lesson 6 Fingerlings, water container, salt and big sieve, video "How to release fingerlings in plastic hole" DVD 1 clip 2.4.6, DVD player/TV or laptop/projector.

2.4 Teaching procedure

2.4.1 Lesson 1 Fish pond location selection

Activity 1: Group discussion on fish pond preparation (20 minutes)

Content book 2.1 A

- Divide the students into groups for a brainstorm on the following questions:
 1. How do we select a location for digging a fish pond?
 2. How do we dig a pond that can meet the proper techniques of raising fish?
 3. What should we do before releasing fingerlings?
- Each group representative reports.
- The teacher trainer corrects answers and concludes the activity.
- The teacher trainer introduces the next activities to practice outside.



Picture 2 Fish pond

Activity 2: Testing Soil Quality (20 minutes)

Content book 2.1 B and C

- Lead the student teachers outside to the practice place.
- Lead the student teachers to test the soil quality for digging a pond according to the information in the content book.
- The teacher trainer concludes the lesson.

2.4.2 Lesson 2 Preparation of an existing fish pond

Activity 1: Practice on preparation of an existing fish pond (40 minutes)

Content book 2.1 D and E

- Lead the student teachers outside to practice the steps that are described in the content book.
- The teacher trainer gives a demonstration on mixing lime with water and how to stir it before throwing it into the pond to kill viruses and pests that live in the soil.
- Take soil from the bottom layer of a natural lake to cover the bottom layer of the pond.
- Transfer water into the pond.
- The teacher trainer concludes the content of lesson.

Remarks: Instruction of digging and preparing the existing pond, please check the content book 2.1 D and E.

2.4.3 Lesson 3 Plastic hole preparation

Activity 1: Group discussion on selecting location for digging a plastic fish hole (20 minutes) Content book 2.2 A to D

- Group discussion questions:
 1. How do we select a location for digging a plastic fish hole?
 2. How do we dig a hole that can meet the techniques of raising fish?
 3. How do we prepare a floating hole like fishermen on the Tonle Sap?
 4. What should we do before releasing fingerlings?
- Each group representative reports.
- The teacher trainer corrects answers and concludes the content of the lesson.
- The teacher trainer introduces next activities during real practice.

DVD 1 clip 2.4.3 Teaching activity: Group work on selection of location for digging the hole (15 minutes)

Activity 2: Practice digging a fish hole (20 minutes)

Content book 2.2 B

- Lead the student teachers outside to the practice place.
- Lead the student teachers to install posts before digging hole. The student teachers start digging the hole according to the steps in the content book.
- Ask the student teachers to finish digging the hole before starting next lesson.
- If there is no possibility to practice at the PTTC then show the video clip on digging the hole DVD 1 clip 2.4.3. (11 min).
The student teachers can practice at home or a farm close by.

2.4.4 Lesson 4 Practice preparing the plastic hole before releasing fingerlings (40 min)

Content book 2.2 D

- Lead student teacher outdoors.
- Take mud from the bottom layer of a pond to cover some of the plastic about 1 dm depth with 0.5 kg/m² of animal's dung.
- Mix white lime with water, stir it and spread it out above the pond in order to disinfect the soil, kill piscivorous species and to make the water clear (5-10 kg/100m²) based on the actual situation of water and soil.
- After transferring water into the hole the lime needs to soak at least 3-5 days.
- About one third of the surface water of the hole should be covered by Azolla in order to provide shelter for the fish.
- The teacher trainer concludes the lesson.

2.4.5 Lesson 5 Selection, Packaging and Delivering Fingerlings

Activity 1: Review questions (5 minutes)

Content book 2.3

- The teacher trainer asks the following question to the whole class: What are the criteria of fish species selection?
- The teacher trainer gives feedback on the answers given.

Activity 2: Playing video clip (15 minutes)

- Play the video clip “How to select, package and deliver fingerlings” DVD 1 clip 2.4.5 (15 min).

Activity 3: Group Discussion (20 minutes)

Content book 2.4 B to D

- Divide the student teachers into groups of 4 or 5 students. Give 1 of the following questions to each group.
Group discussion questions:
 - 1) What is fingerling training? Please describe.
 - 2) Please describe the ways of packaging fingerlings.
 - 3) Please describe the ways of delivering fingerlings.
 - 4) Please describe the ways of releasing fingerlings.
- Ask group representatives to report. The teacher trainer corrects answer and concludes the lesson.

2.4.6 Lesson 6 Practice on releasing the fingerlings in to pond and plastic hole

Content book 2.4 E

- Lead the students to release the fingerlings into a pond or a plastic hole.

Useful instruction

- The best time for releasing the fingerlings is from 8:00-9:00 am and 4:00-5:00 pm.
- Density of fingerlings is 3-5/m² for raising fish in a pond and 40-50/m² for raising in a plastic hole.
- In order to balance the temperature between plastic bag and pond, the fish raiser needs to soak the plastic bag for 15 to 20 minutes before releasing fingerling.
- Transfer fingerlings from a plastic bag to a very big bowl, then mix salt about 300g with 10 litres of water, and keep it for 3 to 5 minutes to sterilize them.
- Slowly incline and softly turn over the bowl to let fingerlings go into the pond.

- If there is no possibility to practice at the PTTC then show the video clip on releasing fingerlings in plastic hole DVD 1 clip 2.4.6 (15 min).
The student teachers could practice at home or a farm close by.

CHAPTER 3 FISH RAISING TECHNIQUES (4 LESSONS)

3.1 Background

To raise fish effectively it is important to take into account the species, sizes and density of fingerlings to be raised as well as taking care of the quality of water and the ways of feeding the fish.

3.2 Objectives

At the end of this chapter the student teachers

Knowledge

- can list kinds of food and know how to control water quality properly in the pond and plastic hole through questioning by the teacher trainer, group discussion and observation.
- explain how to produce fish food and how to feed fish through brainstorming questions, demonstration and class discussion

Skills

- control and monitor water quality through practice outside.
- produce food and feed fish through practice.

Attitude

- prefer family and school scale fish raising.

3.3 Teaching aids

Lesson 1 Flipchart and sentence cards (cut up, see lesson description)

Lesson 2 Broken rice, rice fragment, soy bean, water green and salt, gas cooker, video “How to produce fish food”, DVD player/TV or laptop/projector on DVD 2 clip 3.4.2

Lesson 3 Extra food product, wire steel, flat basket, bamboo and net, video “How to feed fish” on DVD 2 clip 3.4.3, DVD player/TV or laptop/projector

Lesson 4 Observation sheet and pH tester, video “Water quality observation” on DVD 2 clip 3.4.4, DVD player/TV or laptop/projector

3.4 Teaching procedure

3.4.1 Lesson 1 Type of food and water quality management

Content book 3.1 A

Activity 1: Class discussion on types of food (15 minutes)

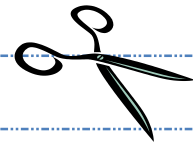
- The teacher trainer asks the following questions to the class:
 - 1) What do fish eat?

- 2) How many kinds of fish food are there?
Expected answer: Fish food is divided into 2 kinds: natural food and additional food.
- 3) What kind of natural fish foods do you know?
Expected answers: vegetable leaves, plant leaves, grains, termites, big red ants, worms, earth worms, kitchen waste and compost fertilizer, etc.
- 4) What kind of extra fish food do you know?
Expected answer: broken rice, any kind of Azolla, water convolvulus, a few kinds of aquatic plants, etc.

Activity 2: Guessing game on controlling water quality in the pond and taking care of fish (25 minutes)

Content 3.1 B and C

- The teacher trainer writes “Water quality management” on the left side of the blackboard and “Monitoring and caring” on the right side.
- Prepare sentence cards by cutting up the information in the boxes below.
- Divide the student teachers into pairs and distribute one sentence to each pair for discussion on the meaning of the cards then ask them to put it on the blackboard in the right category.
- Ask only 4 pairs of student teachers to explain their motivation for putting a card in one of the 2 categories.
- The teacher trainer corrects and concludes content of lesson through a flipchart or PowerPoint presentation.



B) WATER QUALITY MANAGEMENT

Put the fresh plants into the pond to increase quality of water.

At least exchange water 1 – 2 time per a raising cycle when pH of water is increased.

Prevent cows, buffalos, pigs or other activities from making the water muddy;

Do not immerse palm leaves, woods, bamboo or other plants which make the water in the pond poisonous;

Do not use poisonous substances such as agricultural insecticides or detergent in and around the pond;

Please take water plants out, if they increases, and remove all leaves.

Add more fertilizers, fresh plants and dry animals dung 1-2 times/month accordingly.

C) FOLLOWING UP AND MAINTENANCE

Use bamboo twigs or nets to prevent the snakehead murrel, eels and snakes from entering to eat fingerlings.

Set up a dike high enough to prevent rain water from flowing into the pond;

If you see sick fish or dead animals in the pond you need to catch them immediately;

After 2-3 months you need to check the growing rate and number of fish left in the pond when you feed the fish or use a seine to catch your fish;

If the fish are poisoned, reduce fertilizer and postpone feeding for 1-2 days, pump out old water or transfer new water into the pond in order to make movement of water or put Dolomite in the pond;

Try to follow up the activity of fish in the morning, then notice unusual activity of the fish if any.

3.4.2 Lesson 2 Practice fish food production

Content book 3.1 A

- Brainstorming question: What ingredients can be used to produce food to help fish in a pond or a plastic hole to grow quickly?
- The teacher trainer shows the ingredients and demonstrates how to produce fish food.
- If there is no opportunity to demonstrate then show the video clip “how to produce fish food” DVD 2 clip 3.4.2 (15 min).
- The student teachers practice on producing food in groups following the instruction in the content book.
- The teacher trainer guides the groups during the practice.



Picture 3 Fish food production

3.4.3 Lesson 3 How to feed fish in a plastic hole

Content book 3.1 A

- Brainstorming question: Which ways of feeding fish do we know?
- Lead the student teachers outside to practice feeding the fish (ordinary food and termites)
- Discuss on and show how to put food in a basket and how to feed fish with termite.
- The teacher trainer asks the question: What are disadvantages of irregular feeding?
- The teacher trainer summarizes the content of the lesson.
- If there is no opportunity to practice this with the student teachers show the video clip “How to feed fish in a plastic hole” on DVD 2 clip 3.4.3.

3.4.4 Lesson 4 Observation on Water Quality Management of plastic hole (40 minutes)

Content 3.2 B and C

- Divide the student teachers into groups.
 - Distribute the observation sheet (on the next page) and ask the student teachers to go and observe the situation of the plastic hole.
 - After the observation each group representative presents results.
 - Reflecting questions:
 - 1) Why does the water have the colour it has?
 - 2) If water has low quality, what will we do?
 - 3) If the level of pH in water is not good, how can we treat this issue?
 - 4) What should we do to monitor and take care of the plastic hole?
 - 5) What can cause fish to die? How can we avoid an increase of fish dying?
 - The teacher trainer summarizes the content of lesson on flipchart or blackboard.
- DVD 2 clip 3.4.4 Teaching activity: Video clip showing water quality observation at plastic hole (15 min).**

Observation sheet

Group: _____

Date of observing: _____

Venue of hole (kind of fish) _____

Observation	Result
1) What is the colour of hole water?	
2) What is the smell of water?	
3) Does water have bubbles?	
4) How many level of pH in water does it have?	
5) What is the level of the water? (use a stick and measuring tape)	
6) Does the hole get enough sunlight?	
7) Are there any dead fish? How many?	

CHAPTER 4 DISEASES AND PREVENTION (3 LESSONS)

4.1 Background

Fish raising in a plastic hole and pond has to be properly managed. If you do not pay attention when raising fish, the fish can get sick easily. When they get sick, it is difficult to cure them. Therefore prevention and maintenance are better than treatment.

4.2 Objectives

At the end of this chapter student teachers

Knowledge

- can list reasons that cause fish to get sick through brainstorming questions, individual work and group work.
- know how to prevent diseases clearly through brainstorming questions and group discussion.
- can tell how to produce natural medicine and how to treat fish diseases through brainstorming questions and practice.

Skills

- can identify the reasons that cause fish to get sick through individual work.
- can prevent the fish disease through real practice during raising.
- can produce natural medicine through real practice.

Attitude

- promote family and school scale fish raising.

4.3 Teaching aids

Lesson 1 Fish skeleton analysis paper (see lesson description and life skills box), word cards and flipchart, PowerPoint on fish diseases on Disc 3 folder 4.4.1, laptop/computer and projector

Lesson 2 Flipchart

Lesson 3 White lime, salt, water container and neem leaf.

4.4 Teaching procedure

4.4.1 Lesson 1 Diseases and their causes

Activity 1: PowerPoint on fish diseases (10 minutes)

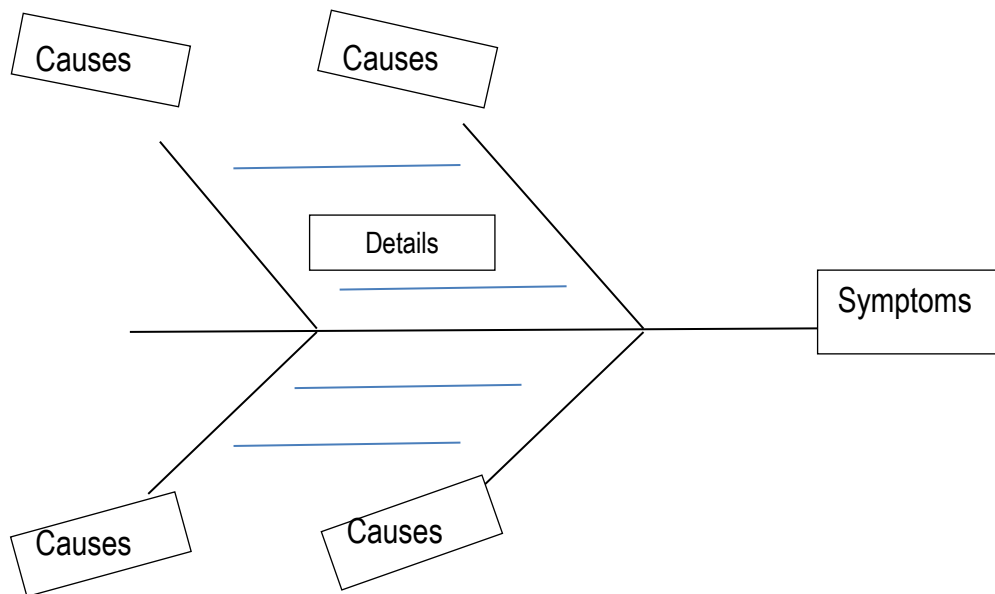
Content book 4.1 A

- The teacher trainer asks: What are problems of lacking fish raising technique?
- 🕒 The teacher trainer shows the PowerPoint or flipchart on fish diseases Disc 3 folder 4.4.1

Activity 2: Fish Skeleton Analysis (30 minutes)

Content book 4.1 B

- Divide the student teachers into 8 groups. Each group will receive a flipchart with the outline of a fish skeleton and a disease card (burned wound disease, parasites, frozen blood and white pox).
- The student teachers discuss to find the cause of fish disease on their card. They write the symptom on the fish head, the causes of the fish to get sick on the fish bone structure and they can put extra information on the fish back.
- Each group representative presents and compares result with others.
- The teacher trainer corrects answers.
- The teacher trainer summarizes 4 main fish diseases (kinds of disease, symptom and reason).



Picture 4 Fish bone analysis

4.4.2 Lesson 2 Disease prevention and treatment

Activity 1: Group discussion on preventing disease (25 minutes)

Content book 4.2

- Brainstorming question: Why do we need fish disease prevention?
- Divide the student teachers into 8 groups and put discussion questions on the blackboard.
 - 1) How do we prevent white pox disease?
 - 2) How do we prevent frozen blood disease?
 - 3) How do we prevent burned wound disease?
 - 4) How do we prevent parasites disease?
- Each group representative presents answers.
- The teacher trainer corrects answers.
- The teacher trainer presents on how to prevent and treat 4 fish diseases.

Activity 2: Calculations on ingredient of making medicine for treating fish diseases (15 minutes)

- Give the student teachers the following exercises to calculate:

Types of diseases	Treatment	Example exercises
1. Infected wound	– for 100 m ² pond, use 2 kg of salt or lime mixed with 30 litres of water, spread out around the pond banks for 4-5 days consecutively;	If a pond is 350 m ² how much salt or lime with how many litres of water?
2. Parasites	– chop 0.5 kg of neem leaf and put it in cloth bags; – 4-5 bags/100m ² ; – 4-5 days consecutively; – Change neem leaf every 3 days.	How much neem leaves do you need after 9 days for a pond of 150m ² ?
3. Coagulated blood	– Mix 1 kg of salt with 1 litre of water, (or mix 1 kg of lime with 30 litres of water) for 100 m ² and then spread it out on the surface of water (once a day, at 9 am, for 4 days). – Grind 20-40 heads of live crab mixed with 1 kg of rice bran and then feed the fish for 4-5 days.	If a hole is 24 m ² how much salt or lime with how many litres of water?

- The teacher trainer corrects answers and concludes the lesson.

4.4.3 Lesson 3 Practice on making natural medicine

Content book 4.3

Activity 1: Group work (40 minutes)

- Divide the student teachers into 4 groups.
- Each group makes medicine for treating fish diseases such as: burned wound, parasites, frozen blood and white pox following the instructions in the content book.
- Each group representative presents the ingredients and explains how to make medicine.
- The teacher trainer corrects and concludes the result.

LIST OF MULTIMEDIA FOR FISH RAISING

DVD/Disc	Lesson	Multimedia	Source
Chapter 1 Family scale fish raising			
Disc 3	1.4.2 Lesson 2 Fish species and their bio living	Activity 1 PowerPoint on fish species	VVOB
Chapter 2 Pond and plastic hole preparation			
DVD 1	2.4.3 Lesson 3 Plastic hole preparation	Activity 1 Video Group work selecting location for digging	Open Institute/ VVOB
DVD 1	2.4.3 Lesson 3 Plastic hole preparation	Activity 2 Video How to dig a plastic hole	Open Institute/ VVOB
DVD 1	2.4.5 Lesson 5 Selection, packaging and delivering fingerlings	Activity 2 Video How to select, package and deliver fingerlings	Copyright © CEDAC 2008
DVD 1	2.4.6 Lesson 6 Practice on releasing fingerlings	Activity 1 Video How to release fingerlings in plastic hole	Open Institute/ VVOB
Chapter 3 Fish raising techniques			
DVD 2	3.4.2 Lesson 2 Practice fish food production	Activity 1 Video How to produce fish food	Open Institute/ VVOB
DVD 2	3.4.3 Lesson 3 How to feed fish in a plastic hole	Activity 1 Video How to feed the fish	Open Institute/ VVOB
DVD 2	3.4.4 Lesson 4 Observation of water quality	Activity 1 Video Water quality observation at plastic hole	Open Institute/ VVOB
Chapter 4 Diseases and prevention			
Disc 3	4.4.1 Lesson 1 Diseases and prevention	Activity 1 PowerPoint on fish disease	VVOB

LIST OF PICTURES

Picture	Source
Picture 1 Aqua culture – 3 ways	Agromisa; Agrodok 15, small-scale freshwater fish farming
Picture 2 Fish pond	VVOB SEAL 2011
Picture 3 Fish food production	VVOB SEAL 2011
Picture 4 Fish bone analysis	VVOB SEAL 2011

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Farmer and Nature, Techniques of fish raising in a pond, CEDAC, 2007

Policy for Curriculum Development 2005-2009, Ministry of Education, Youth and Sport, 2006

Trainer's manual to Improve Household-scale Fish culture, VVOB ImAgE programme, 2011

Webpage with organisation as author

<http://www.unicef.org/lifeskills>