Simple Record Keeping For Fish Farmers

FRESH WATER FISH CAGE CULTURE TECHNIQUES

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FOOD AND AGRICULTURE ORGANIZATION (FAO) OF THE UNITED NATIONS
INTEGRATED MANAGEMENT OF LAGOON ACTIVITIES (IMOLA)
PROVINCIAL PEOPLE'S COMMITTEE (PPC), THUA THIEN HUE, VIETNAM

ABOUT THE PRODUCER AND BACKGROUND OF THIS SIMPLE RECORD KEEPING BOOK

In recent years, the coastal and Tam Giang lagoon fisheries resources in Hue have been decreasing rapidly. Illegal, unregulated and unreported fishing and aquaculture practices are widespread, causing coastal degradation, decline in wild fish stocks, and poverty within coastal fishing communes. Fishing communes that are already vulnerable to natural disasters and other shocks recognize the need for better management plan and for adopting wise practices that are more appropriate for the ecosystem and the people.

In 1998, the Government of Vietnam and the Provincial People's Committee of the Thua Thien Hue Province, located in central Vietnam, requested technical assistance from the Food and Agriculture Organization of the United Nations (FAO) in the sustainable management of the aquatic resources of the Tam Giang lagoon. In 2005, with financial support from the Italian Government, FAO started implementation of a project aiming at improving the livelihoods of the people dependent on the Tam Giang Lagoon by promoting a participatory sustainable management of the hydro-biological resources. Based on the existing socio-economic and production systems, and with particular emphasis on the gender roles, the project aims at enhancing people's food security and the reduction of poverty in the lagoon area. The project is entitled “Integrated Management of Lagoon Activities in Thua Thien Hue Province” or the IMOLA Hue project (GCP/VIE/029/ITA).

This field tested Simple Record Keeping Book is prepared as a part of the activities by the IMOLA Hue project to assist local fish farmers to record and monitor environmental and economic conditions of their aquaculture activities more efficiently and sustainably.

WHY KEEPING RECORD?

A small-scale fresh water fish cage farm should be managed efficiently to maintain and increase productivity and profitability. Fish farmers should keep track of all their inputs and outputs so that production costs, sales, and net income can be easily calculated to evaluate the overall economic performance of the fish cage farms. Also to sustain productivity, the environmental conditions need to be monitored closely to avoid pollution and fish diseases.

It is a good hands-on practice to maintain farm management records. Records are needful to identify problems in the cage environment and fish health and to minimize these constraints at the earliest during the production cycle. Record keeping also helps the fish farmers to learn from past mistakes, thus reducing risk, hazards and costs of production in subsequent crops. Records are useful to plan the entire crop cycle including stocking densities for each cage, well ahead of its start. Farm records ideally should contain details on cage preparation, fingerlings and its stocking, feed management, water quality parameters and its management, cage bottom management, fish health and harvest.

By reviewing the data in the record keeping book, fish farmers can determine the ways of increasing productivity of their fish cages for the next crop cycle, based on the lesson learned from the previous cycles. At the same time, the farmers can assess the causes of environmental pollution and their relationship with their production activities. This simple record keeping book can assist the farmers to monitor the environmental and economic conditions of their cage production in a simple and easy way.

This record keeping book would be most useful for the farmers with a few small fresh water fish cages (1-3).

THE MAIN PURPOSE OF THE RECORD KEEPING IS TO:

- Enable fish farmers to develop their production in an environmentally sustainable way (by monitoring water environment and water quality of fish cages as daily/weekly/yearly basis), i.e., what kinds of environmental changes are occurring in the production area and what would be the potential reasons?
- Assist fish farmers to understand the economic conditions of their culture facility (fresh water fish cages) better and accurately, i.e., how much cost (cage materials, fingerlings, feeds, medicine, etc.), sales, net profit, etc. the production requires/makes?
- Help fish farmers manage their cage farms better by keeping a daily/monthly/yearly record of culture activities and transactions over a culture period, which enable farmers to evaluate performance of their activities and determine ways and means of further improvement economically and environmentally.
- Enable fish farmers to increase the quality and efficiency of their production and income while maintaining environmental conditions.
- Use the record keeping book for monitoring of cage farming activities and support for fish farmers by the government extensionists.
- Maintain production records for accessing credit, micro-finance,or insurance services from financial institutions (as these institutions often ask for the records of production, which cannot be prepared overnight).
- Ensure the traceability of the products – although most of the products are currently for local market, processors and exporters these days request the information on production, especially for foreign market.

Note: This Simple Record Keeping Book is developed principally for the use by local fish farmers. However, the provision of clear guidance to local fish farmers through regular monitoring visits by government extensionists is essential to maintain the effectiveness and accuracy of record keeping. Government extensionists need to assist the fish farmers to check their record keeping book and provide further suggestions for improvement based on the finding and discussion with local fish farmers.

WHAT IS INCLUDED IN THIS RECORD KEEPING BOOK?

This record keeping book has three main components:

(1) General Information of the Fish Farmer

You will register your personal and household profiles here.
Please make sure you fill this sheet before start using the record keeping book.

(2) Monitoring Water Quality

In this part, you will record the result of your periodic water quality monitoring.
This part contains the following three sheets to assist you:

- Water quality monitoring sheet (daily/weekly)
- Water quality monitoring sheet (monthly)
- Water quality monitoring sheet (yearly)

(3) Basic Accounting and Economic Record Keeping

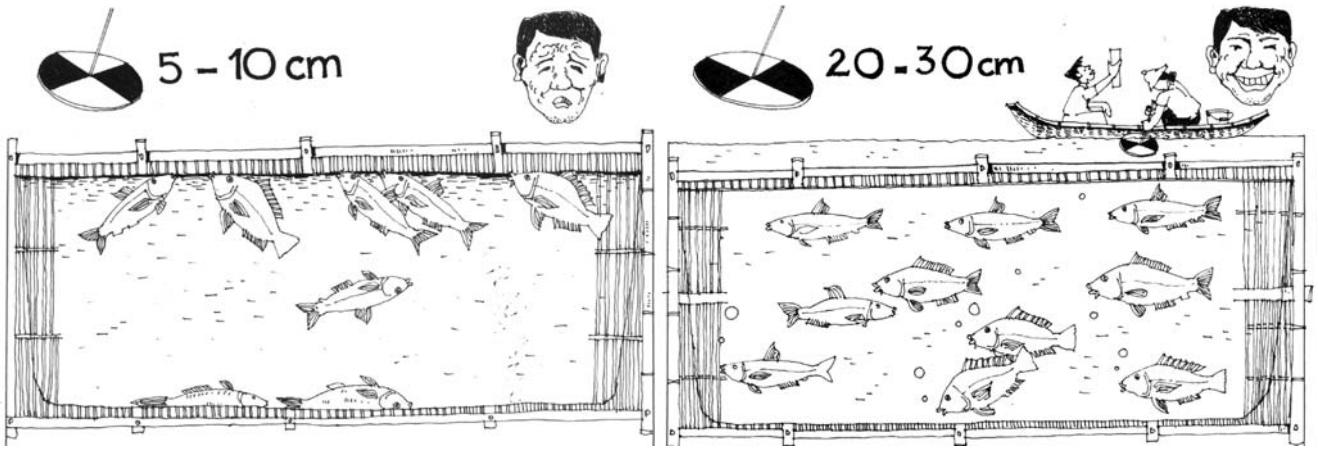
In this part, you will record the economic information about your culture activities.
This part contains the following three sheets to assist you:

- Fish stocking record sheet
- Cage farming record sheet (monthly)
- Cage farming record sheet (yearly)

It is very important that you keep record of all required items carefully. Good record keeping will give you good advice and suggestions for further improvement!!

The next four slides provide you with some instruction about how to use this record keeping book.

Regular record keeping book maintenance by the fish farmers would enhance the fish production.

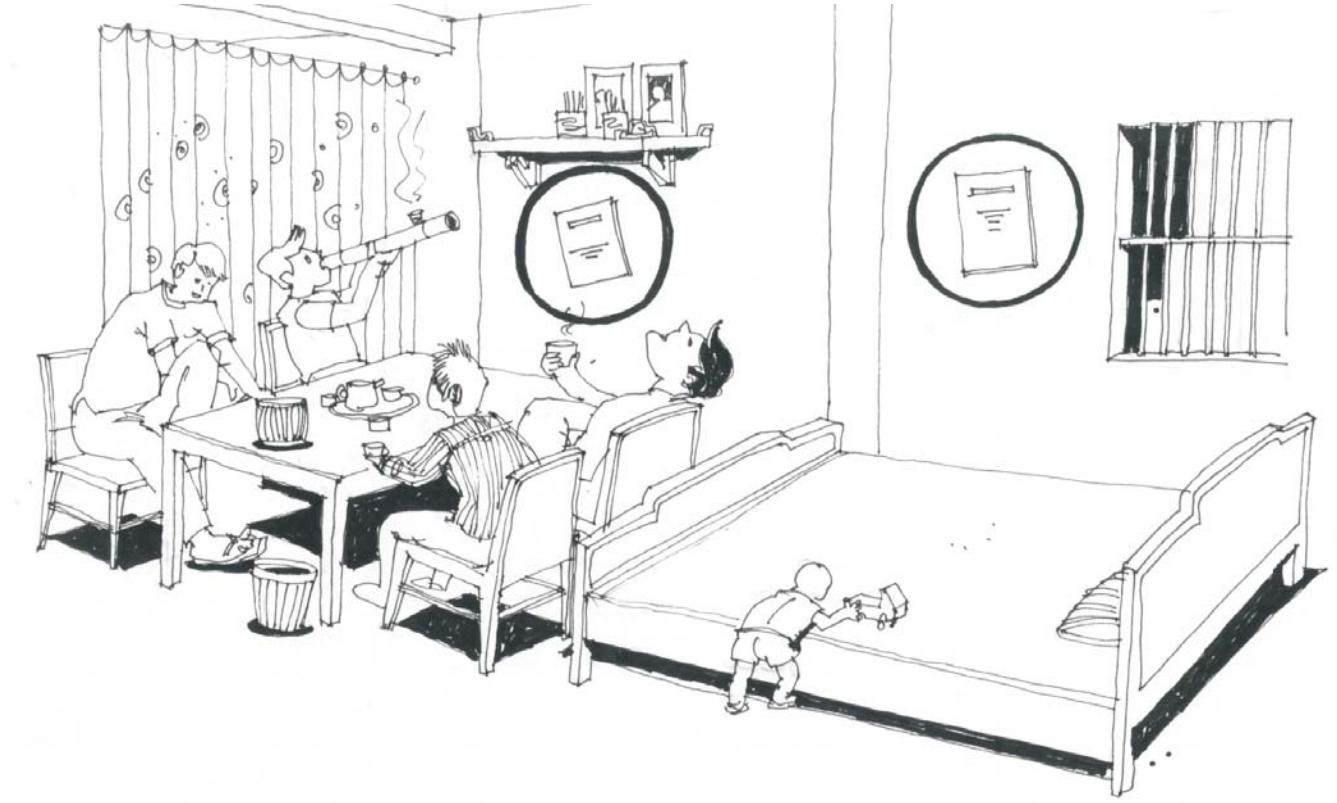


Poor water quality, e.g., lack of oxygen, can cause a loss of cultured fish in cages. The above picture shows low Secchi disc transparency, which indicates potential depletion of oxygen in water (see Chapter 7 of the Extension Manual for more information).

Good water quality can maintain the good growth of cultured fish. Water quality monitoring is essential to ensure good water quality.

Water quality monitoring helps fish farmers to reduce the risk of fish diseases and maintain good water conditions.

It is important that fish farmers discuss their record keeping books with government extensionists during their field visit.



Each fish farmer should store the record keeping book in a visible place (e.g., on the wall) at home so that the farmer is always reminded to fill it regularly.

GENERAL INFORMATION ON THE FISH FARMER

 Name:.....

 Address:.....

 Age:.....

 Sex (Male/Female):.....

 Education:.....

 Number of Family Members:.....

 Number of Workers:.....

 Number of Cages:.....

 Size of Each Cage:.....

Note: Name, age, sex, and education are only required for household head. The number of workers is the number of people working in/for the culture facilities. This may include non-family members.

PART I

(WATER QUALITY MONITORING)

WATER QUALITY MONITORING SHEET (DAILY/WEEKLY)

A Week from 01/04/2008 (Mon) through 07/04/2008 (Sun) (Use Lunar Calendar)

Cage Number:.....

Day/Date (dd/mm/yyyy)	Feeding Record (Type, Quantity, and Source) Observation/ Remedial Measures Taken [Example: use of medicine (KMnO4, Salt water (Nacl), Bronze sulphate, Sulphate (CuSO4), Formalin, Erythromycin, Vitamin C, KN-04-12, Vaccine Reovirus, Chinese herbal medicine: berry leaves (lá xoan), lime, etc.]	Feeding Time (Write feeding time)		
		Morning	Noon	Afternoon
MONDAY 01/04/2008	**[Example] Duckweed 50kg (locally harvested) x 3times Water color reddish, water smell fishy**	07:00	13:00	17:00
TUESDAY				
WEDNESDAY				
THURSDAY				
FRIDAY				
SATURDAY				
SUNDAY				

- **Whenever you feed your fish, please record feed type, quantity, and source as well as feeding time.**
- **Please take note of any observation (e.g., smell or color change), event that may affect water quality (e.g., natural hazards), or remedial action you took in fish cages.**

WATER QUALITY MONITORING SHEET (MONTHLY)

MONTH & YEAR: March 2008 **(Use Lunar Calendar)** **Cage Number:.....**

Week	Water quality parameters					
	pH	Alkalinity (ppm)	Temperature (^{o}C)	Water level (m)	Water color	Transparency (cm)
1	(Example) 6	15 ppm	24 ^{o}C	2.0 m	Reddish	57 cm
2	5	14 ppm	23 ^{o}C	2.0 m	Reddish	51 cm
3	5.5	16 ppm	25 ^{o}C	2.0 m	Reddish	50 cm
4	5.0	17 ppm	26 ^{o}C	2.0 m	Reddish	49 cm
5						
Ave.	5.37	15.5 ppm	24.5 ^{o}C	2.0 m	Constant / Change	51.7 cm

1. Water quality monitoring is necessary once a week, desirably on the same day of the week (e.g., every Monday).
2. At the end of the final week of a month, calculate the average for the month.
3. For the last column for water color, state if there is any change in color during the month.

WATER QUALITY MONITORING SHEET (YEARLY)

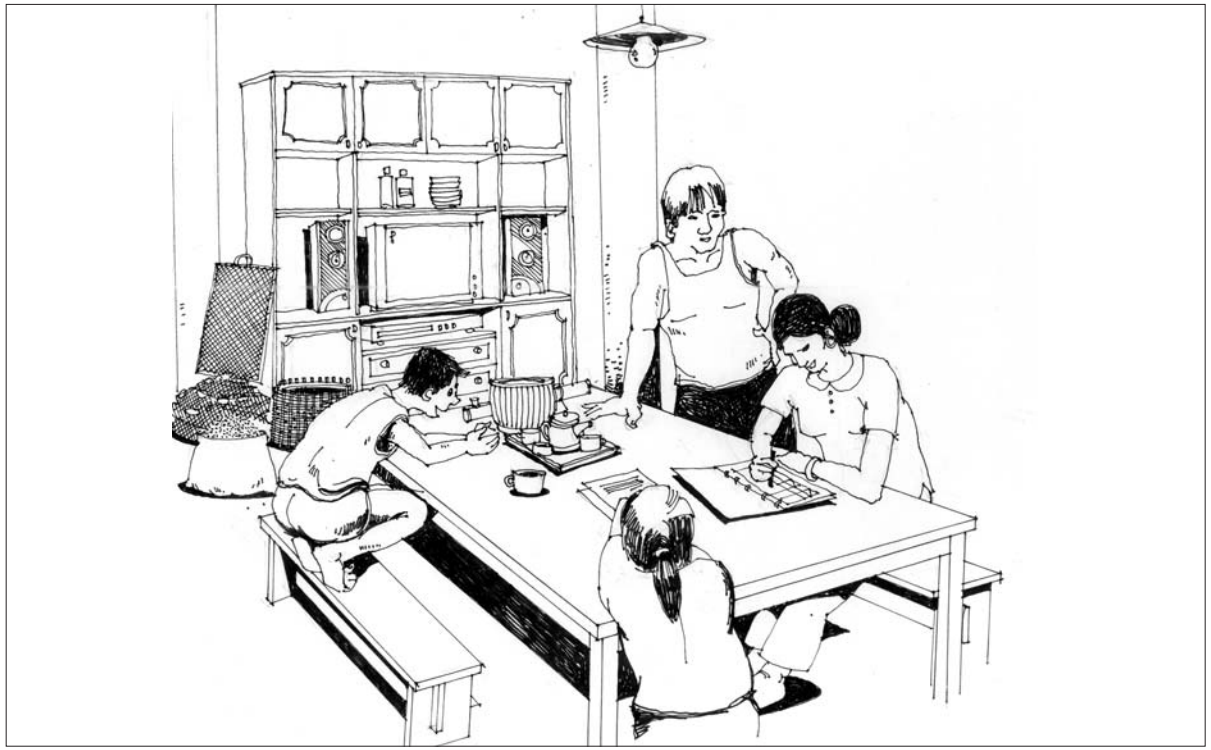
YEAR:_____2008_____ (Use Lunar Calendar) Cage Number:.....

Month	Water quality parameters					
	pH	Alkalinity (ppm)	Temperature (^{o}C)	Water level (m)	Water color	Transparency (cm)
Jan.						
Feb.						
Mar.	(Example) 5.37	15.5 ppm	24.5^{o}C	2.0 m	Constant	51.7 cm
Apr.						
May						
Jun.						
Jul.						
Aug.						
Sep.						
Oct.						
Nov.						
Dec.						
Ave.					Constant / Change	

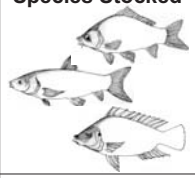
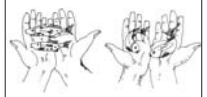
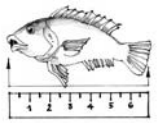
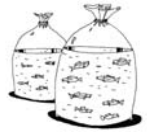
1. Copy monthly average data from monthly monitoring sheet (previous page).
2. At the end of a year, calculate the average for the year.
3. For the last column for water color, state if there is any change in color during the year.

PART II

(BASIC ACCOUNTING AND ECONOMIC RECORD KEEPING)

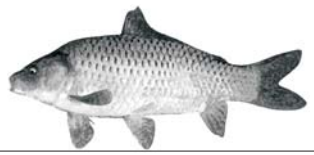


FISH STOCKING RECORD SHEET

Cage # 	Date of Stocking 	Source of Fingerling 	Species Stocked 	Status of Fingerling Stocked 	Standard Fingerling Size (cm) 	Number of Fingerlings Stocked 
(Example) 1	10 April 2008	(1)Hue Fish station (2)District hatchery	(1) Grass carp (2) Common carp	(1) Bright color, fast movement (2) Pale color, sluggish movement	(1) 25-30cm (2) >10cm	(1) 20-30 fingerlings/m^3 (2) 40-50 fingerlings/m^3

*** For species stocked, see also the illustrations of fish species on the following page.**

COMMONLY CULTURED FISH SPECIES IN FRESH WATER FISH CAGES

Fish Species (English/Vernacular/Latin Names)	Fish Illustration
Vietnamese mud carp / Cá trôi Việt ***(Cirrhinus molitorella)***	
Grass carp / Cá trắm cỏ ***(Ctenopharyngodon idella)***	
Tam Giang carp / Cá dày ***(Cyprinus centralus)***	
Nile tilapia / Cá rô phi vằn (***Oreochromis niloticus***)	
Common carp / Cá chép (***Cyprinus carpio***)	

CAGE FARMING RECORD SHEET (MONTHLY)

MONTH & YEAR: January 2008 **(Use Lunar Calendar)**

Date	Activities/Actions Taken	Money Spent (Variable Costs)	Fish Harvest / Loss			Remaining Fish Balance in Cages		
			Sales		Non-Sales			
		Total Cost (VND)	Quantity (# & kg)	Income (VND)	(e.g., family use, given free, loss) (#)	Cage 1 (#)	Cage 2 (#)	Cage 3 (#)
(Example) 1	Set up the cage #1	100,000						
2	Fingerling stocking cage #1	50,000				150		
10	Wages for hiring a worker to repair cage (#1) net	100,000						
26	Family consumption				5	145		
31	Sell fish in the market		100 20kg	600,000		45		
Total		250,000	100 20kg	600,000	5	45		

Examples of Variable Costs:

- Fingerlings
- Feed (natural, supplementary, and factory-made)
- Fish cage materials
- Medicine for fish
- Harvesting tools
- Wages for hiring worker
- Transportation of fingerling and fish for sale
- Miscellaneous

If you have more than 3 cages, add extra column(s) next to Cage 3

1. **Enter data when any activity/action is taken (if you are stocking several species in one cage, divide the columns or assign ID for each species as you like so that you can record data for each species separately).**
2. **At the end of every month, calculate the total for each item.**

CAGE FARMING RECORD SHEET (YEARLY)

YEAR: 2008 (Use Lunar Calendar)

Month	Money Spent (A)	Fish Harvest / Loss			Remaining Fish Balance in Cages				Net Profit (B-A)
		Sales (B)		Non-Sales					
	Total Cost (VND)	Quantity (# & kg)	Income (VND)	(e.g., family use, given free, loss) (#)	Cage 1 (#)	Cage 2 (#)	Cage 3 (#)	Total (#)	Total (VND)
Jan.	(Example) 250,000	100 (20kg)	600,000	5	45				350,000
Feb.									
Mar.									
Apr.									
May									
Jun.									
Jul.									
Aug.									
Sep.									
Oct.									
Nov.									
Dec.									
Grand Total									

Net Profit = Sales (B) - Money Spent (A)

1. Copy monthly average data from monthly record sheet (previous page).
2. Calculate net profit using the sales and cost (=money spent) data.
3. At the end of a year, calculate total for the year.

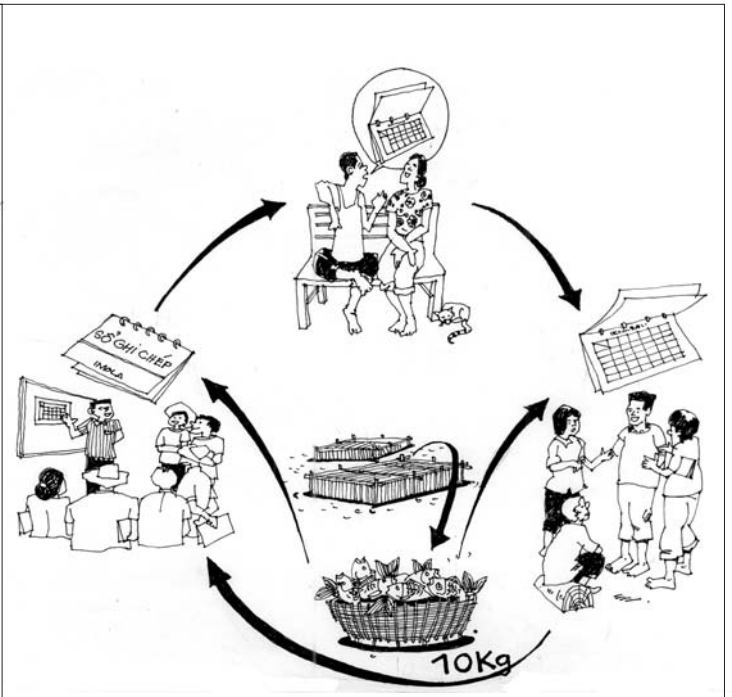
DISCUSS AND SHARE YOUR RECORDS WITH OTHERS

During and at the end of the record keeping for a year (or even at the beginning of the next production cycle), have a discussion and share findings with others including your family members, other fish farmers, government extensionists, and others.

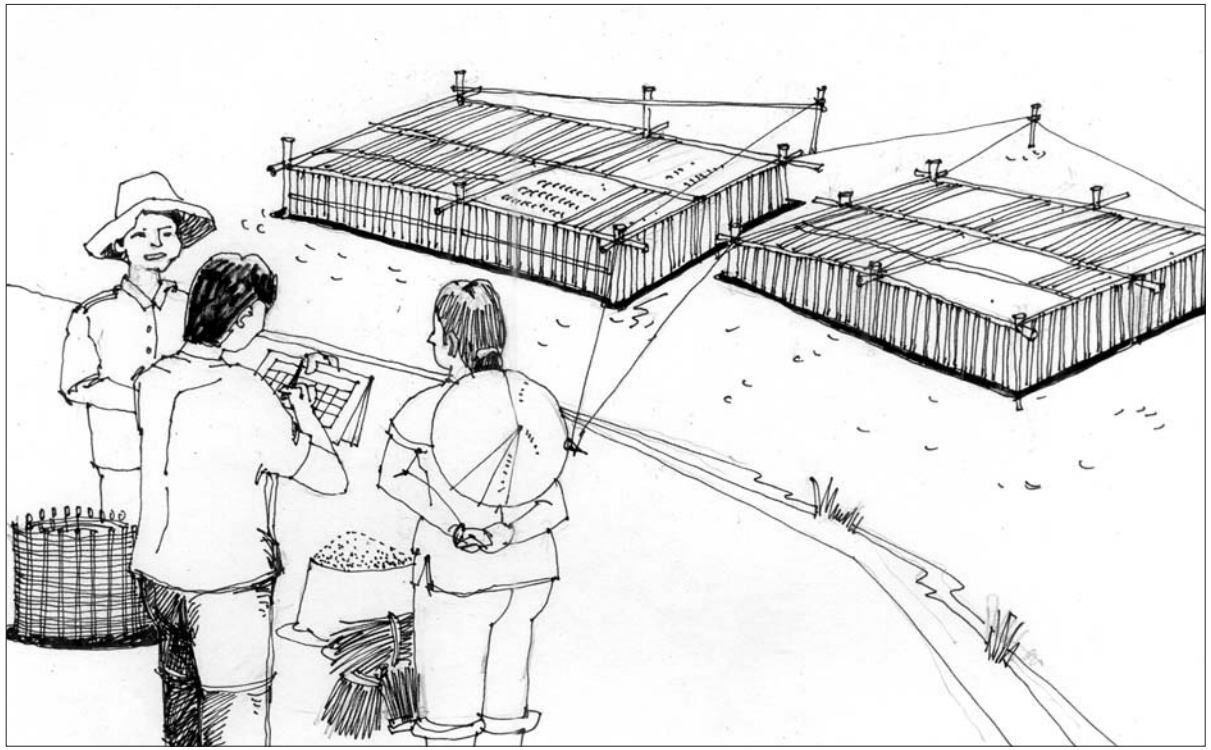
For instance, you can talk of:

- Is the net profit increased compared to the last season/year?
- Is the environmental conditions improved compared to the last season/year?
- Is there any identifiable problems environmentally or economically? What would be the reason(s)?
- Can the cost be reduced in the next production cycle?
- Is there any other way to enhance net profit?
- Is there any significant change in environmental conditions? If yes, what would be the potential reason(s) for the change?
- Is there any issue that farmers can solve jointly?
- What is your/group strategy for the next production cycle?

Good discussion ensures good strategy and improvement for the future!!



ANNEX



WATER QUALITY MONITORING SHEET (DAILY/WEEKLY)

A Week from _____through _____(Use Lunar Calendar)

Cage Number:.....

Day/Date (dd/mm/yyyy)	Feeding Record (Type, Quantity, and Source) Observation/ Remedial Measures Taken [Example: use of medicine (KMnO4, Salt water (Nacl), Bronze sulphate, Sulphate (CuSO4), Formalin, Erythromycin, Vitamin C, KN-04-12, Vaccine Reovirus, Chinese herbal medicine: berry leaves (lá xoan), lime, etc.]	Feeding Time (Write feeding time)		
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MONDAY				
TUESDAY				
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THURSDAY				
FRIDAY				
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SUNDAY				

WATER QUALITY MONITORING SHEET (MONTHLY)

MONTH & YEAR: _____ **(Use Lunar Calendar)** **Cage Number:.....**

Week	Water quality parameters					
	pH	Alkalinity (ppm)	Temperature (^{o}C)	Water level (m)	Water color	Transparency (cm)
1						
2						
3						
4						
5						
Ave.					Constant / Change	

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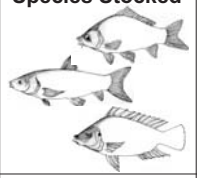
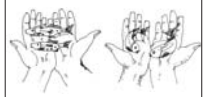
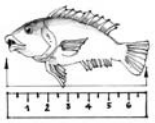
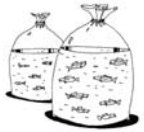
Feb.						
Mar.						
Apr.						
May.						
Jun.						
Jul.						
Aug.						
Sep.						
Oct.						
Nov.						
Dec.						
Ave.					Constant / Change	

FISH STOCKING RECORD SHEET

Cage # 	Date of Stocking 	Source of Fingerling 	Species Stocked 	Status of Fingerling Stocked 	Standard Fingerling Size (cm) 	Number of Fingerlings Stocked 

CAGE FARMING RECORD SHEET (MONTHLY)

MONTH & YEAR:_____ **(Use Lunar Calendar)**

Date	Activities/Actions Taken	Money Spent (Variable Costs)	Fish Harvest / Loss			Remaining Fish Balance in Cages		
			Sales		Non-Sales			
		Total Cost (VND)	Quantity (# & kg)	Income (VND)	(e.g., family use, given free, loss) (#)	Cage 1 (#)	Cage 2 (#)	Cage 3 (#)
Total								

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MONTH & YEAR:_____ **(Use Lunar Calendar)**

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MONTH & YEAR:_____ **(Use Lunar Calendar)**

Date	Activities/Actions Taken	Money Spent (Variable Costs)	Fish Harvest / Loss			Remaining Fish Balance in Cages		
			Sales		Non-Sales			
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CAGE FARMING RECORD SHEET (MONTHLY)

MONTH & YEAR:_____ **(Use Lunar Calendar)**

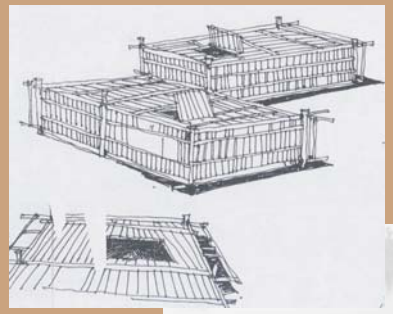
Date	Activities/Actions Taken	Money Spent (Variable Costs)	Fish Harvest / Loss			Remaining Fish Balance in Cages		
			Sales		Non-Sales			
		Total Cost (VND)	Quantity (# & kg)	Income (VND)	(e.g., family use, given free, loss) (#)	Cage 1 (#)	Cage 2 (#)	Cage 3 (#)
Total								

CAGE FARMING RECORD SHEET (YEARLY)

YEAR:_____(Use Lunar Calendar)

Month	Money Spent (A)	Fish Harvest / Loss			Remaining Fish Balance in Cages				Net Profit (B-A)
		Sales (B)		Non-Sales					
	Total Cost (VND)	Quantity (# & kg)	Income (VND)	(e.g., family use, given free, loss) (#)	Cage 1 (#)	Cage 2 (#)	Cage 3 (#)	Total (#)	Total (VND)
Jan.									
Feb.									
Mar.									
Apr.									
May									
Jun.									
Jul.									
Aug.									
Sep.									
Oct.									
Nov.									
Dec.									
Grand Total									

Net Profit = Sales (B) - Money Spent (A)



SIMPLE RECORD KEEPING FOR FISH FARMERS
(Fresh Water Fish Cage Culture Techniques)

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Cover photo courtesy of Kibria and Hai:
"A series of typical bamboo made fresh water fish cages operating in the Quang Thai commune"

Preparation of This Simple Record Keeping

The preparation of this Simple Record Keeping Book has mobilized the IMOLA project team as well as several experts from governmental, non-governmental, and academic institutions. The preparation was initially coordinated by Arie Pieter van Dujin and later by Baku Takahashi under the overall supervision by Massimo Sarti. The drafts were prepared by Md. Ghulam Kibria, Nguyen Quang Linh, and Vo Thi Tuyet Hong. Translation was undertaken by Ho Bich Huong Giang and Le Xuan Hoang, and drawings and layout design were prepared by Tran Vu Hai. Special thanks also go to Flavio Corsin, Nguyen Thi Phuoc Lai, Nguyen Nhu Tiep, and Raymon van Anrooy who provided useful comments on this Simple Record Keeping Book.

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