Resilient Aquatic Food Systems for Healthy People and Planet

Manual on Cage fish farming for beginners

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1.0 INTRODUCTION TO FISH FARMING

Fish farming, also known as aquaculture, is the process of raising fish in an enclosed area for personal use or profit. It is the fastest growing area of animal food production.

1.1 Importance of fish farming

1. To make better use of the land or water body
2. For income generation
3. As a source of employment/job creation
4. To satisfy nutritional needs
5. For food security and health
6. As an alternative source of fish production
7. For aesthetic purposes

1.2 Types of fish farming

There are different types of fish farms that utilize different aquiculture methods. Examples include tank farming, cage farming, earthen pond farming, pen farming, etc. (Plates 1.1-1.6)

Plate 1.1 Polytank system

Plate 1.2: Concrete tanks

Plate 1.3: Earthen pond

Plate 1.4: Cage system

Plate 1.5: Pen culture

Plate 1.6: Tarpaulin system

1.3 Planning a fish farm

1. Cages can be built on waters that support aquatic life. This may include stream, a river, a lake or a reservoir.
2. Seek advice from your local fishery office
3. Discuss your business plan if available with experts
4. Obtain basic knowledge in the farming act (either by attending training, from the internet, extension officer etc.)
5. Choose a suitable area in the water body to install your cages (area should be at least 5 meters and above deep)
6. The area chosen should be free from environmental pollution
7. Identify and source inputs (materials for construction, feeds, fingerlings, farm equipment) locally
8. Obtain enough capital to undertake the business venture

9. Find market source for your produce

1.4 Type of fish species to culture

Many species of fish are suitable for culture. Some considerations to consider in selecting the type of fish to culture include the following:

1. Growth rate of the species
2. Its reproductive behaviour
3. The nutritional requirements of the fish
4. Its acceptability of artificial feeds
5. Market value
6. Its ability to withstand environmental conditions
7. Its ability to survive in the confined environment
8. Social and cultural norms of the chosen species
9. National regulations of that species

Below are some species cultured in Ghana include tilapia, African catfish, African bony tongue and shrimps (Plates 1.7-1.10).

Plate 1.7: Tilapia

Plate 1.8: African catfish

Plate 1.9: African bony tongue

Plate 1.10: Shrimps

1.5 Permit requirement

There are laws regulating the conduct and practices of aquaculture in Ghana. Before starting the operations, the following permits needs to be obtained from the following authorities:

1. Water Resources Commission
2. Environmental Protection Agency
3. Fisheries Commission
4. Local authorities

2.0 CAGE SYSTEM

2.1 What is a cage fish farming?

A cage is a system that confines the fish or shellfish in a mesh enclosure. It has a completely rigid frame (on all sides). The mesh retains the fish, making it easier to feed, observe and harvest them. The mesh also allows the water to pass freely between the fish and surrounding water resource, thus maintaining good water quality and removing wastes.

The cage system use cages that are placed in lakes, ponds, reservoir, dugouts and oceans that contain the fish. Fish are kept in the cage and are “artificially fed” till it is harvested. The cage can be of any size, shape and form. It can be constructed of galvanized pipes, HDPE/PVC pipes, wood or bamboo (Plates 2.1-2.4).

Plate 2.1 Circular cages made of HDPE pipes

Plate 2.2: Cages made of galvanized pipes

Plate 2.3: Rectangular cages made of bamboo

Plate 2.4: Wooden cage frames

2.2 Advantages of cage system

1. Cage culture can be established in any suitable body of water
2. Compared to pond construction, cage system can be inexpensive
3. It is easier feeding and observing fish behavior
4. There is greater protection from predators like birds, frogs, crocodiles, and other fish species
5. Harvesting and sampling is easier compared to other systems
6. Water flows freely in and out of the cage, flushing out waste and supplying much-needed oxygen
7. Fish can be stocked at higher densities

2.3 Disadvantages of cage system

1. Nutritionally balanced feed must be applied all the time
2. Water quality problems, particularly low dissolved oxygen, are common in cage culture
3. Diseases are a common problem in cage culture and they can cause massive losses
4. Caged fish are an easy target for poachers and vandals
5. Predators can prey on your fish if there is an opening in the nets
6. Strong winds can destroy cages if not installed properly

2.4 Site selection for cage system

Site selection is very important in aquaculture because it could cause failure or success. Choosing the best site can reduce risks to the farm and maximize production and profit. Here are some factors to consider:

1. good water quality (temperature, pH, dissolved oxygen, turbidity) and adequate water exchange
2. depth of water (at least 2m from the bottom of cage net) and current speed
3. no predators
4. protection from strong winds and waves
5. avoid setting your cage in water transport routes
6. the area should be accessible for the transport of inputs and harvested products

2.5 Construction of the cages

A cage can be of any shape and size. It can be round, square or rectangular

2.5.1 Cage components

A. Frames

i. Cages can be made of galvanized pipes (Plate 2.5), wooden frames, bamboo or other material that will not easily deteriorate in water.
ii. Cages can be of any size, depending on a farmer's specifications.
iii. The frame should be mechanically strong, resistant against corrosion, and easily repairable or replaceable.
iv. Special joints must be used for fixing the various frame elements together.

B. Netting

i. The netting has three major functions, it keeps the fish stock together, protects the stocks against harmful external influences and allow water to flow freely through the cage.
ii. The mesh size of the cage bag or production net should be at least 1 inch. The mesh size of the protective netting should be at least 2 inches, and the cover net can be made with either a 1 or 2 inch mesh size (Plate 2.5).
iii. A quarter-inch net can be sewn and placed inside the production net to hold newly stocked fingerlings (weighing less than 2 grams) for nursing.
iv. A larger mesh size improves oxygen supply to the stocks and reduces fouling problems.

v. Avoid clogging and fouling the net by cleaning it regularly or replacing it as needed.

C. Floaters

i. The floats should suspend the cage structure (netting, frame, feeder, walkway, etc.) safely on the water surface.
ii. Examples of floaters include drums (rubber barrels) (Plate 2.5), gallons and PVC pipes.

D. Anchorage

The cage requires an anchor to hold it in place.

i. An anchorage can be made with concrete and placed in the water column to hold the cage firmly in place with 16 mm rope.
ii. A wooden platform can be laid on top of the cage to facilitate movement and farm operation (Plate 2.5).

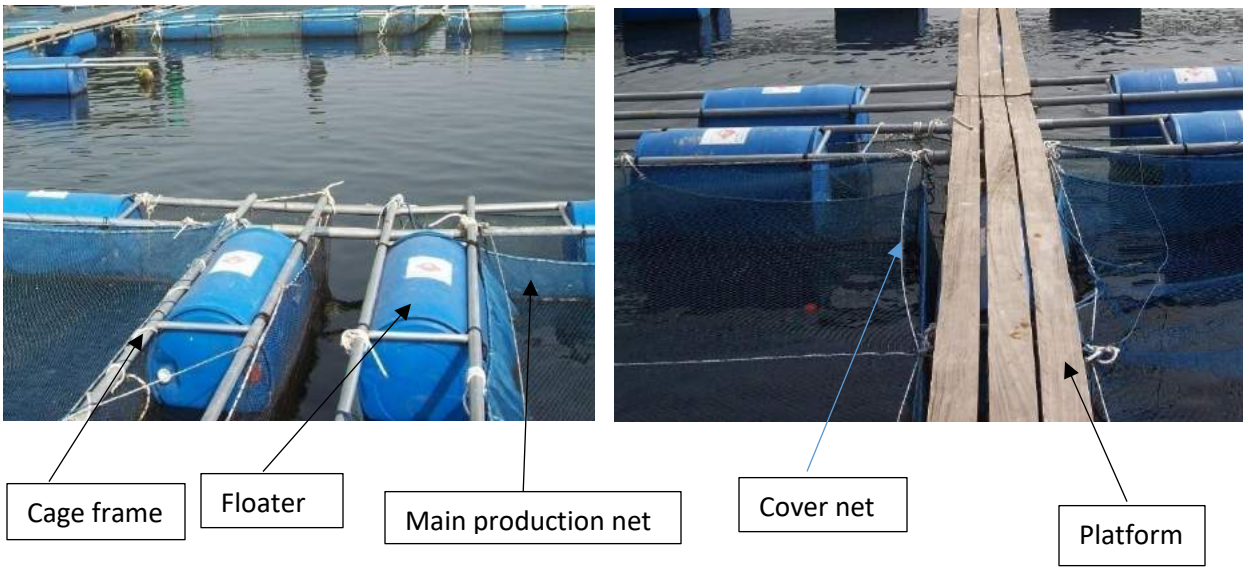


Plate 2.5: Parts of installed cage

2.5.2 Installation of cages

i. Cage components (frames and floaters) should be fixed on land first, and then towed to the specified location on the water to be fixed (Plate 2.7)
ii. All nets to be fixed are to be inspected prior to fixing (Plate 2.6)
iii. Secure your cage firmly in place by anchoring (Plate 2.9)
iv. Enough personnel's should be engaged in the fixing

Plate 2.6: Cage net inspection

Plate 2.7: Towing cage to fixing area

Plate 2.8: Fixing net in cage

Plate 2.9: Securing cage anchors

3.0 TRANSPORT AND STOCKING OF FISH IN CAGES

Fingerlings must be transported from the hatchery to cages for stocking. Transport of the fingerlings involves the movement of fish: within the same farm (on-farm movement), from one farm to another, from one country to another, or from one culture system to another (e.g., from pond to cage).

Healthy fish must be transported to encure higher survival. Fish are generally transported in containers such as cans of different sizes, pots of ceramic or metal, wooden or metal buckets, barrels, plastic bags, styrofoam boxes and bottles. Certain containers provide good insulation from heat, for example, wood or styrofoam. Containers like metal or plastic are poor insulators and may have to be wrapped with wet towels or packed with ice to keep temperatures down.

When transporting fish, the following principles must be followed:

1. Fish must rest well before transport
2. Transport fish in the early morning or late evening (before sunrise or after sunset)
3. Fish must be healthy and transported in clean waters
4. Fish can be transported in the right containers
5. Use ice to reduce water temperature during transportation
6. Load your fish in a ratio of 1 kg of fish to 1 kg of water
7. Allow enough oxygen for aeration (Figure 3.1)
8. If you carry your fish in poly bags, carry the bags in a box so that they will not break (Figure 3.2)
9. Fish can also be transported in specialized truck desighned for fish transport (Plate 3.1)
10. Participate in the estimation of the fingerlings you want to buy

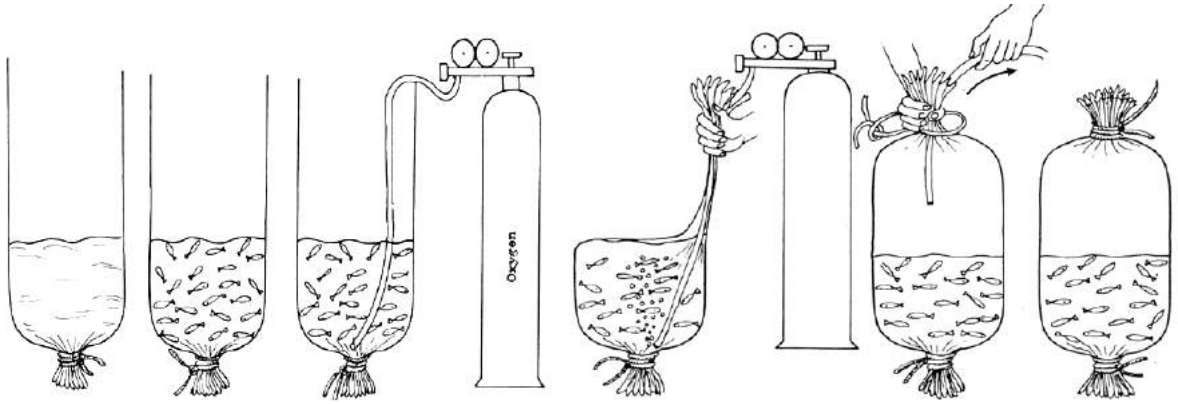


Figure 3.1 Packing fish for transport

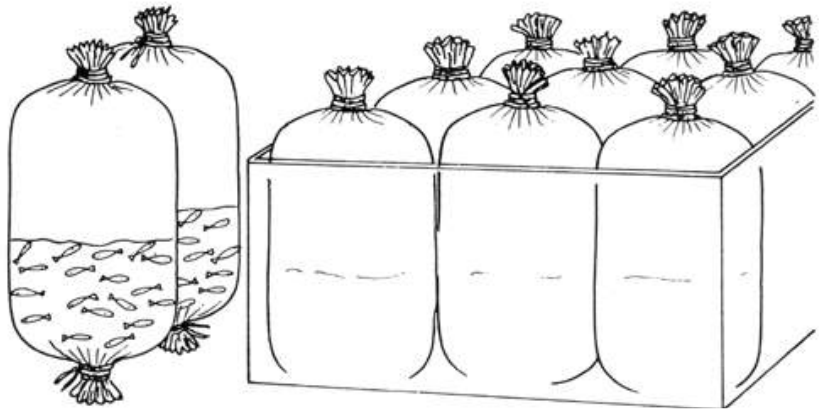


Figure 3.2: Packaged fish for transport

Plate 3.1: Fish packed in containers for transport

3.1 How to calculate stocking density

The stocking density is rather expressed as number of fish per unit volume or the total expected biomass per unit volume at harvest time. In other words, stocking number refers to the total number of fish per volume of the cage. Table 3.1 shows examples of cage sizes and the estimated stocking numbers.

Table 3.1: Size of cage and its appropriate stocking

Cage Size (LxBxH) (m)	**Volume (m^3)**	**Effective production Volume (m^3)**	**Stocking Rate**	**Stocking Number**
5x5x4	100	87.5	50-80	4,375-8,750
5x5x5	125	112.5	50-80	5,625-11,250
5x5x6	150	137.5	50-80	6,875 - 13750
6x6x6	216	198	50-80	9,900-19,800

NB: Survival of the fish and production outputs are subject to prevailing water quality conditions in the area and management options.

3.2 Stocking the cage

Cages that are not stocked properly in the beginning can result in an unbalanced populations of slow growing or stunted fish. Cages that are too shallow are prone to fish kills caused by warm weather drought conditions hence cages should satisfy the depth conditions.

Some factors to consider when stocking:

1. Obtain fingerlings to stock your cage from a certified nursery.
2. The fingerlings you stock should be at least 10 grams in size
3. Stock between 50 – 80 fingerlings per cubic metre, depending on management and market needs or demand (Table 1).
4. Stock fish preferably early in the morning.
5. Before releasing fish into your cage make sure temperature of both transport and receiving waters are about same. Do this by allowing gradual exchange of water between the two (Figure 3.3).
6. Fish should be allowed to swim out freely from the bags/containers into their new environment (Plate 3.2)
7. Be sure to take out any dead fish and record mortalities as they occur

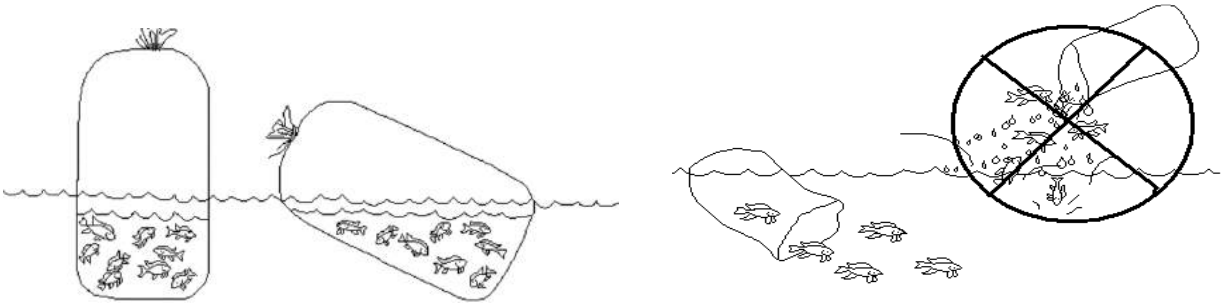


Figure 3.3: Releasing fish in water

Plate 3.2: Release of fish in pond and cage

3.3 Precautions after stocking

1. Do not feed immediately after stocking
2. Starve fish for at least 24 hours before feeding
3. Introduce feed to fingerlings gradually before giving them full ration
4. Remove mortalities once they occur
5. Keep records of mortalities and feed given

4.0 FEEDS, FEEDING AND SAMPLING CAGES

After proper stocking, the most important practice of cage culture is providing good quality feed in the correct amount to the caged fish. Feeding your fish is an important component of the cage system since fish are restricted from searching for their own feed. The diet should be nutritionally complete, containing vitamins and minerals (Plate 4.1). One must ensure the feed is appropriate for the size/age of the fish. Fishes will eat more as they grow, however, avoid overfeeding.

4.1 Some factors to consider in selecting feeds for fish

1. The acceptability of the feed by the fish
2. The choice of feed should be relatively cheap and available
3. The feed should be able to meet the nutritional requirement of the fish
4. Choose the right feed type (powdered, pellets) (Plate 4.2) and protein requirement for the fish.

4.2 Feeding rate and feeding times

1. Feed fish to satisfaction or based on their body weight
   (Quantity of feed per day = biomass x % body weight, where biomass = average weight x total no. of fish)
2. Feed fish three to five times a day. Fish grow better if fed regularly. The bigger the fish grow, the more food it takes
3. If fish do not eat all their food, it could be due to poor quality feed, low water temperature, or the fish stressed.
4. Fish are fed little by little so that one can see them eating.
5. If they eat all of their food quickly, give them a little more and if they do not eat all, feed less.
6. Feed are spread on the surface of cage by hand broadcast (Plate 4.3). It is advisable to hang a mosquito net around the edges of the production net (feed guard) to prevent feed from moving out of your cage

Plate 4.1: Feed brands available on the market

Plate 4.2: Different forms of feed

4.3 Recommended feed sizes for different development stages

1. Fry and larvae (0.01 - < 1 g): powdered feed;
2. Fingerlings (1–5 g): Particle size, 0.5-2 mm (granules or crumbles);
3. Juveniles (5–50 g): Particle size 2-3 mm;
4. Adults (> 50 g): Particle size 3-6 mm.

Plate 4.3: Feeding fish in cage

4.4 Protein requirement

Different size of fish require different protein levels in the diet. The protein requirement for small size fish is higher compared to that of big size fish (Table 2.1)

Table 2.1: Protein requirement for different size of tilapia

Fish Size	% CP Required
< 20 g	40 - 45%
20 - 100 g	38 - 40%
100 - 250 g	33 - 35%
250 - 450 g	32 - 30%
> 450 g	28 - 30%

4.5 Feed purchase, storage and handling

1. Always check labels and buy the freshest diet in the store
2. Purchase only the quantity of diet that will be consumed within 4 to 6 weeks
3. During transportation and handling, protect the feed from moisture, heat and direct sunlight
4. Feeds should be kept as dry and cool as possible
5. Do not store and use pesticides or other toxic materials near the feeds

6. Rough handling of feeds should be avoided
7. Do not stack bags of feed directly against a wall or on a concrete floor (Plate 4.4)
8. Bags of feed should be on pallets, away from the floor and wall to allow air to circulate around them, and to prevent moisture from coming in contact with the bags (Plate 4.5)
9. Pests such as mice, rats, cockroaches and ants must be prevented from getting to the feeds (Plate 4.6)
10. Inventory should be used on a first-in/first-out basis
11. Do not keep or use moldy or spoiled feed

Plate 4.4: Bad feed storage

Plate 4.5: Good storage of feed

Plate 4.6: Rodents and insect that attack feeds

4.6 Sampling in cages

Sampling is the temporary removal of fish from the cage/pond. The major reasons for sampling are to:

1. monitor growth and general performance,
2. re-calculate feed requirements,
3. determine when fish are ready for market

4. determine if the cage/pond has reached its carrying capacity
5. assess the health of the fish

For cages, the recommendation time interval is between 2 weeks or maximum 4 weeks

To remove fish, the cage bag is partially lifted out of the water and scooped with a dip net

A sample of fish (minimum of 50) is selected at random and then weighed with a suitable measuring scale and returned to the cage for further growth (Plate 4.7)

The weighing could be individually or bulk weighing, at least 5 subsamples of ten (10) individuals must be weighed, depending on the size

The average weight could then be determined, and this is used to calculate the total weight or biomass of all the fish in the cage.

The amount of feed is the adjusted using the new average weight.

Plate 4.7: Procedure for sampling in cages

When not to sample:

1. Fish are sick and show signs of extreme stress.
2. When there is lightning during a rain-storm.
3. When the water quality is poor (fish gasping for air, too cold or warm temperatures, low dissolved oxygen levels)

Some precautions to consider

1. Done early in the morning/late evening
2. All sampling equipment and personnel's must be present
3. Scoop representative sample of population
4. Fish must always be in water
5. Minimize stress by excessive handling
6. Use gloves to handle fish
7. Regularly inspect the cage nets (production, protective, etc.) to correct any damage

8. Isolate fish that show signs of sickness and report immediately to an Extension Officer

5.0 WATER QUALITY MANAGEMENT

Water quality management is a key ingredient in a successful fish operation. Most periods of poor growth, disease and parasite outbreaks, and fish kills can be traced to water quality problems. Fish carry out all body functions in water such as breathing, feeding. reproduction, excretion hence water quality affects fish health, fish growth and performance.

5.1 Signs of bad water quality

1. Changes in water color (e.g., too greenish or brownish)
2. Fish gasp at surface
3. Fish groups around fresh incoming water
4. Slow growth of fish
5. Change in turbidity
6. Build up of excess nutrients in water causing algal bloom
7. Excessive growth of weeds in water (Plate 5.1)
8. Non-fish animals leave the water
9. Repeated health problems
10. Poor transparency
11. Massive mortalities

Plate 5.1: Bad and good water quality

5.2 Causes of Poor Water Quality

1. Use of poor quality feed
2. Overfeeding
3. Overstocking
4. Decomposition of vegetation

5. Stagnation of the water

5.3 Advantages of poor water quality management

1. Good harvest (Plate 5.2)
2. Minimized mortalities
3. Minimized risk of fish diseases
4. Good tasty fish – no off-flavour
5. Increased profitability

5.4 Disadvantages of Poor water quality management

1. Poor growth
2. High mortality (Plate 5.3)
3. Poor harvest
4. High financial losses

Plate 5.2: Good fish harvest

Plate 5.3: High fish mortalities

5.5 How to maintain good water in your cage

1. Remove any dead fish as soon as you see them
2. Watch out for signs of bad water quality
3. When water quality is bad, reduce feeding
4. Regular monitoring of key water quality parameters (Plates 5.4, 5.5)
5. Aerate when necessary
6. Keep to appropriate stocking density
7. Ensure appropriate feeding plan – do not overfeed
8. Regular cleaning of cage nets and structures

Plate 5.4: Monitoring transparency of water

Plate 5.5: Monitoring temperature and DO

5.6 Caring for your fish

1. Monitor your fish regularly
2. Fish will show signs if conditions are not favorable (e.g., erratic swimming, loss of appetite, unusual gasping for air, mortalities)
3. If your fish show these signs, check the water quality and try improving it if necessary
4. If condition remains unchanged, stop feeding immediately for a day or two, and seek help or advise from a Fishery Officer or an Extension Officer
5. When you begin to feed them again, first give them small amounts of food and then slowly increase the amount
6. When your fish begin to eat as before, you will know that they are well again
7. Remove any dead fish as soon as you spot them

5.7 Cleaning and maintaining your cage

1. The meshes in a cage get clogged with dirt, debris, algae and other matter that may be found in the water column.
2. This prevents the free flow of water, nutrients and dissolved oxygen into and out of the cage.
3. Effective cleaning of the cage must be carried out regularly for optimum performance of the fish and cage.
4. The netting material should be cleaned with a brush or soft broom, if possible.
5. Check the cage routinely to make sure there are no holes or gaps in the netting.
6. Gaps in the netting should be mended immediately with mending twine.
7. You also need to inspect your anchorage often times to make sure your cages are firmly in position.

6.0 BIOSECURITY AND DISEASE MANAGEMENT IN FISH

Biosecurity refers to measures that are taken to stop the spread or introduction of harmful organisms to human, animal and plant life. Choice of farm location, the design of farms and sources of your fish stock has an effect on the farms biosecurity.

6.1 Use of biosecurity

1. Reduce risk of disease introduction
2. Minimize spread on-farm or to new areas
3. Promote fish health
4. Protect economic investment
5. Protect against new diseases
6. Protect human health

6.2 Causes of disease in fish

1. Poor water quality (low dissolved oxygen, improper pH, high temperature)
2. Pollution (chemical treatments, agro-based chemicals, spills)
3. Diet composition
4. Overcrowding
5. Predation and aggression
6. Microorganisms (internal and external parasites, bacteria, viruses and fungi)
7. Procedural stressors (handling, transport, treatments)

6.3 Measures to be adopted on farm

1. Ensure that all inputs and supplies (e.g., animals, feed, drugs and chemicals, etc.) coming into farm are from a certified source
2. Culture environment should be safe, adequate and good quality
3. Vehicles, equipment and visitors must have designated points with clear signage
4. Regularly disinfect all equipment used to handle fish
5. Maintain and improve standard of farm sanitation and hygiene (farm, equipment and staff/visitors)
6. Dead fish and trash fish should be properly disposed of at designated sites
7. Near dying fish should be kept in a safe location and properly disposed of at designated sites once dead
8. Reduce stress levels in animals by avoiding overcrowding, overfeeding, underfeeding, excessive handling, etc.

6.4 Common signs and symptoms of diseases in fish (Plate 5.1)

1. Erratic swimming

2. Gulping for air
3. Crowding at inlets and outlets
4. Rubbing body against cage walls or protruding objects
5. Reduced or no feeding
6. Swollen/protruded abdomen (stomach)
7. Pop/blind eye
8. Wounds

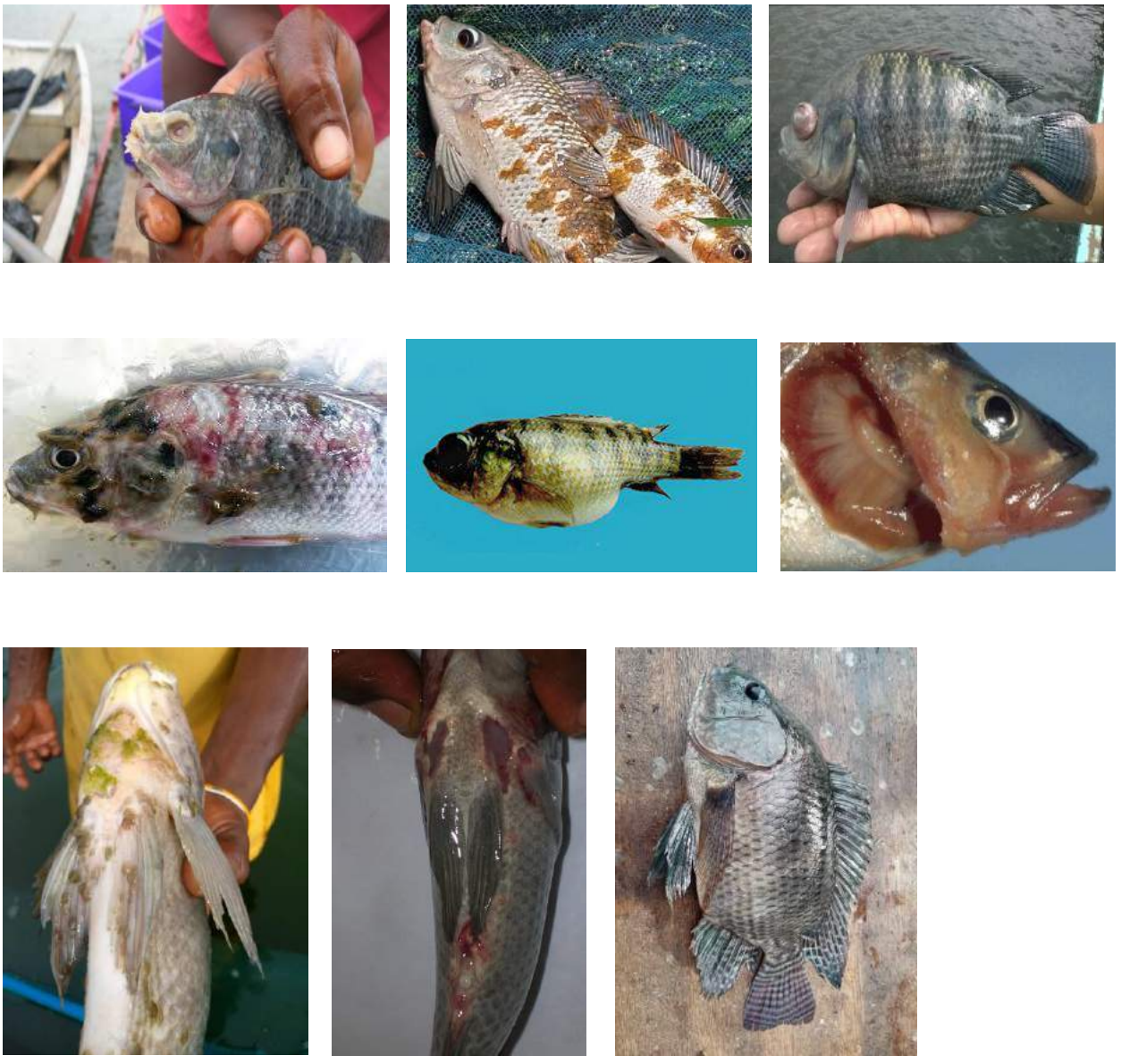


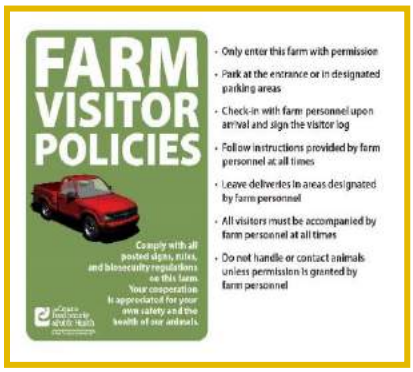
Plate 6.1 Some common signs of diseases

6.5 Controlling the spread of fish diseases

Upon signs of diseases, quarantine and restrict movement of fish. Immediately report to an Extension Officer for advice on how to control fish diseases. Remove and bury dead fish as soon as you spot them (Plate 6.2).

Plate 6.2: How to bury mortalities

6.6 Physical security signage



7.0 HARVESTING AND MARKETING OF FISH

Fish are ready for harvesting depending on the size one wants to achieve as well as the market demand. Harvesting is done based on your marketing plan. There can be partial or complete harvesting depending on the market demand. The main purpose for producing fish to harvest is to sell and make profit.

7.1 Considerations before harvesting fish for market

1. Carry out the profitability analysis of the cultured fish
2. Do a market survey for fish prices
3. Ensure that the market has been arranged first and is ready to take the fish (advertisement)
4. Decide on partial or total harvesting and retailing or wholesale of the harvested fish
5. It is advisable not to feed fish two days prior to harvesting

6. If possible get a sample of fish out to check the flesh quality and/or taste
7. Estimate potential income from the harvest
8. Before harvest and sales, fish should be subjected to a health inspection

7.2 Partial and Total harvesting

7.2.1 Partial harvesting:

1. Harvest the fish required by order
2. More value addition as farmer targets specific markets
3. More stress to farmer as the frequency of harvest is increased
4. It encourages stress and weight loss of reserved fish
5. Reserved fish should be fed until sold out
6. Reserved fishes encourages stealing

7.2.2 Total harvesting:

1. Less stress as harvested fish is all sold
2. Less value addition
3. It encourages post-harvest losses if not all is sold
4. No stealing as all fish is sold

7.3 How to maintain the freshness of harvested fish

1. Stop feeding fish at least 1 day before harvest
2. Kill the fish rapidly before gutting or filleting
3. Use clean water and containers and avoid placing fish directly on the ground
4. If fish are to be sold fresh, the best way to guarantee freshness is to sell the fish alive or on ice
5. For value addition and extension of shelf life, store fish on ice (Plate 7.1), in cold storage, smoke, salt, dry or fillet fish


Plate 7.1 Harvesting and preserving fish

7.4 Causes of fish spoilage

1. Activities by bacteria (germs), enzymes (acids), blowflies, dermestes, beetles, moulds and other organisms.
2. Exposing fish to high temperatures
3. Poor handling
4. Delay in processing

To avoid spoilage, chill (cool) the fish quickly, process or sell

7.5 Marketing of fish

To be able to sell more of harvested table-size fish at better prices, consider the following questions:

1. Where to sell the fish?
2. To whom should the fish be sold to?
3. How should the fish be sold?
4. When should the fish be sold?
5. At what price should the fish be sold?

7.6 Advertising opportunities

1. Social media (mobile phones)
2. Farmer associations
3. Community radio announcements
4. Fish dealers
5. New fish mobile app

8.0 RECORD KEEPING

Analysis of any aquaculture enterprise, be it site assessment, production or marketing is dependent upon sound information. Records of the farm are often the most reliable form of information available. Records form the basis for making sound management decisions. A lack of records or poor record keeping is likely to result in bad decision-making due to a lack of business insight.

Accurate, up-to-date and comprehensive data is required for:

1. Monitoring and evaluation of farm performance.
2. Making business and investment decisions and assessing farm credit.
3. Measuring relative profitability of various culture systems and other activities relating to the fish farm.
4. Maintaining statistical database by the relevant agencies and which informs the formulation of government policies on aquaculture.
5. Ensuring effective assessment of risks.

Examples of record keeping sheets found below:

DAILY ACTIVITY

Farm……. Month……. Manager …..

Date	Activity	Remarks

WATER QUALITY PARAMETERS

Farm……..Manager…….....Month……

Date/Time	PH	Ammonia (ppm)	Nitrite (ppm)	Nitrate (ppm)	DO (ppm)	T (^{O}C)	CO_2 (ppm)	Alkalinity (ppm)	Turbidity (cm)	Hardness (ppm)

POND STOCKING

Farm name…….Period of Management……..Manager…….

Pond No.	Pond size	Date stocked	Species	No. stocked	Av. wt (g)	Source of fish	Cost per fish (GHS)	Remarks

SAMPLING AND FEEDING SCHEDULE

Farm…….Month…….Manager……

	A	B	C	D	E	F	G	H	I	J
Pond No.	**No. of fish**	**Mortality**	**Av. wt at stocking (g)**	**Sampling date**	**Sample size**	**Sample wt (g)**	**Av. wt (g) (E/F)**	**Total biomass (g) (GxA)**	**Feeding rate (%)**	**Daily feeding ration (JxH)**

FEEDING

Farm…….Month…….Manager……

Date	Pond No.	Number of fish	Quantity of feed (kg)

FISH HARVEST AND SALES

Farm…….Manager……..

Date	**Pond no.**	**Species**	**Quantity harvested (kg)**	**Total or partial harvest**	**Average wt (kg)**	**Quantity sold**		**Quantity given out**		**Unit price (**GHS**)**	**Total sales/ income (**GHS**)**
						No.	**kg**	**No.**	**kg**		

INCOME & EXPENDITURE

Date	**Income**				**Expenditure**				**Comments**
	Activity	**Quantity**	**Unit cost (GHS)**	**Amount (**GHS **)**	**Activity**	**Quantity**	**Unit cost (GHS)**	**Amount (**GHS**)**	