Summary

This practice describes different methods to harvest fish from ponds. Including some recommendations for marketing.

Description

1. Deciding when to harvest

The decision to harvest the fish from a pond is made for two main reasons:

1. The fish has attained the right size at which it gives maximum profit in the market and any further waiting may reduce the profit.
2. When the prevailing market opportunities (like Christmas and Easter) offer the highest profit and the opportunity may be lost with delay.

1.1 Using information from regular sampling of fish

In order for the farmer to decide that the fish has attained optimum size for harvest, the farmer must have been sampling and weighing the fish; and analysing the data (see table below).

Example of sampling data for Jacob. The data shows that the monthly increase in fish weigh rises until month ten. After month ten, although the fish continues to grow, the rate of growth keeps falling (see table below).

In table below after month Ten, the quantity of food the fish eats increases while the growth rate falls. It is advisable to harvest the fish at month ten to avoid loss in profit.

Emphasis (impact point): See grey area in table below.

- Delayed harvesting of farmed fish leads to loss of profit; and
- farmers do not necessarily make more profit by growing fish to bigger sizes.

2. Methods and gear for harvesting pond fish

2.1 Definition

Method means “ways of harvesting;” “Gear means tools used to harvest”.

Once the fish has reached the right size for harvest the pond should be harvested immediately.

2.2 How do we harvest fishponds?

Among the common methods and gear for harvesting fish from ponds are:

- Harvesting by draining the pond using basket traps;
- using hooks and baits;
- using a dip net; and
- using a seine net.

The methods and gear for harvesting fish ponds depend...
on the size of pond.

2.1.2 Harvesting by draining the pond
This method of harvesting is the simplest and most effective. Water is let out of the pond by opening the sluices or lowering pipes at the outlet. As the water level drops and the water moves towards the deeper end of the pond, the fish drift with it. Finally, all the fish collects at the outlet and is collected by hand or with a net.

As the pond drains, the water level falls at the shallower end of the pond. All the fish drifts towards the deeper end. When the fish has gathered in a small area at the deep end the farmer then collects the fish in a container.

For this method the pond should have been constructed well with a good slope.

Harvesting is made much easier if a depression is made at the point of outlet as a “harvesting bay”. The fish is then scooped or picked from the ditch (harvesting bay). In this way the fish is picked clean and does not bury in the mud.

This method of harvesting is suitable for

\[ \begin{array}{|c|c|c|} \hline
\text{Months fish has grown in the pond} & \text{Average weight of fish each month (gram)} & \text{Increase in average weight each month (gram)} \\
\hline
1 & 4.7 & 0.0 \\
2 & 9.0 & 4.3 \\
3 & 10.6 & 1.6 \\
4 & 12.0 & 1.5 \\
5 & 28.9 & 16.9 \\
6 & 65.5 & 36.6 \\
7 & 121.2 & 55.7 \\
8 & 191.8 & 70.5 \\
9 & 270.2 & 78.5 \\
10 & 380.0 & 109.8 \\
11 & 440.0 & 60.0 \\
12 & 471.7 & 31.7 \\
13 & 504.5 & 32.8 \\
14 & 515.0 & 10.5 \\
15 & 516.0 & 1.0 \\
16 & 517.0 & 1.0 \\
17 & 517.5 & 0.5 \\
18 & 518.0 & 0.5 \\
\hline
\end{array} \]

Source: NAADS-Uganda 2011
both small and large pond. For the larger ponds it is used in combination with seining. Fish collected from the mud tends to be dirty and it dies quickly. Pond fish should be marketed live and clean.

During harvesting, there should be two containers with clean water. The first bucket is for washing off mud from the fish. Then the clean fish is put in another container with clean water to keep it alive. The water for washing the fish should be replaced with clean water when it gets dirty.

2.1.3 Using basket traps
The baskets are important in harvesting small ponds where the farmer cannot afford the more expensive gear. The basket is made from twigs, cane or climbing plants. The larger end is the mouth which has a valve that does not allow the fish to escape once it has entered. Some food is put inside the basket.

• The trap is placed with the open end facing the main pond water. It is given enough time (30 minutes to 1 hour) for the fish to enter.
• The gear is simple to make or cheap to buy. It is easy to operate, but it is limited to only small ponds (not suitable for ponds of more than 200 m²).
• The basket cannot harvest all the fish from the pond. Finally the pond should be drained in order to harvest all the fish.
• The baskets are cheap and made from local materials.

2.1.4 Using hooks
Hooks are bought from shops selling fishing equipment. They vary in sizes from number 1 (the largest) to number 10 (the smallest).

A hook is fixed to a rope tied to a handle. The hook and its rope (hook acid line) are very cheap, simple to make and use. However, a hook catches one fish at a time. Therefore, it is not suitable for good scale commercial production. The hook and line cannot harvest all the fish from the pond. Most of the fish still remain in the pond. The pond should finally be drained to completely harvest the pond.

Hook and line attributes:
• It depends on luck and the operator cannot chose the fish to catch.
• It is not very selective and smaller fish may be caught leaving the larger ones.
• It injures fish and may not be suitable for sampling fish that will be returned into the pond.
• It catches a few fish at a time, depends on luck. Finally the pond must be drained to remove all the fish.
• Only suitable for small ponds (up to 10 m x 20 m).

2.1.5 Harvesting using cast nets
A cast net is a net made like an umbrella. It is tied on a rope. It opens out when cast over the pond. As it sinks deep into the pond the mouth is closed, trapping whatever fish that will be in the water space enclosed.

Advantages of cast:
• The cast nets is cheap.
• It is simple to operate, but requires training in the skills.
• Does not require large labour force (only one person)
• Catches by chance and the operator does not have much choice of the fish to catch.
• It does not harm fish, the fish can be returned into the pond.
• Its operation is limited to only small ponds (1 m x 20 m) and is time wasting for larger ponds.

2.1.6 Using lift nets
The lift net is a net made into a sack with one open end that is dipped into the pond to scoop up fish. The mouth of the lift net is made of a ring made from a cane or a metal rod. The length of the rod or cane is about 11/2 to 2 m long before bending into a ring.

The wider ends are tied to the metal ring. The two open edges of the net are seemed together to make an inverted umbrella and the two pieces closed by tying.

The lift net can be braided by hand (after training) or are bought and trimmed into a cone with one wider end and one narrow end. The wider ends are measured to half the length of the ring for each net.

The lift net can harvest a reasonable quantity of fish, as much as 30 kg at a go and therefore can be applied for commercial production. The method does not bruise or stress fish, and fish can be delivered to the market very fresh. The lift net, however, is not suitable for ponds larger than 2000 m². It cannot harvest all the fish. Finally the pond should be drained so as to complete the harvest.

To operate the net it is dipped into the water and food is placed around the net. The net is left for 30 minutes for fish to gather above it while feeding, then quickly, the net is lifted with the fish that was in the water above it.

2.1.7 The seine net
The seine net is the conventional pond net. It is like an open curtain made of a net with small meshes. The top side of the net is tied to a rope on which plastic round spheres (floats) are attached at about 1 m interval.

The seine net is a large curtain-like net. It has floats on one side that keeps the net above water surface. It has heavy cement balls on another side that keeps the net at the bottom of the pond.

Therefore, the net remains open during fishing. One wing of the net Metal or wooden ring. 1 m long folded into a ring. The bottom side is tied to another rope on which small stones are attached at about 1 m interval. The length of the net should be longer than the width of the pond by an extra 3 to 5 m to make a curve when it is operated. Example: a pond with a width of 20 m requires a seine net 25 m long.

The seine net at the end of the operation. It has trapped fish in the middle (note the number of people required to operate it).

Seine net attributes are:
• It makes bulk harvests (harvesting up to 90 percent of the fish stock in the pond when fished four to six times repeatedly).
• It is expensive (about UGX 10 000 per m length), but it lasts long (up to five years with minor repairs).
• It requires more labour to operate (ranging from 4 people for 10 mx 20 m pond to as many as 12 people for a 20 m x 50 m pond).
• It is most appropriate for large size ponds
• If operated carefully, it does not injure fish much and fish can be returned into the pond.

2.1.8 Harvesting using gill nets
The gill nets are nets with varying mesh sizes. It is operated by setting it well spread in the pond and left there. It is
checked after about an hour or longer. Fish is caught when it pushes its head through the meshes and gets trapped. The gill net is highly selective and the size of fish caught depends on the size of the net. The gill net cannot harvest all the fish in the pond. Gill net attributes are:

- The gill net is expensive for small scale farmers (UGX 15 000 for 4” mesh).
- It may catch many fish, but cannot be used to harvest all the fish. It is easy to operated but the farmer has to enter the pond, Only one person can set it.
- It harms fish and is not suitable for catching and returning some fish.

3. Displaying fish for marketing
Whenever possible it is best to present fish for sale in its freshest form. Live fish is the freshest state. As soon as fish dies, it begins to get bad and the longer it stays the smellier it becomes. When the fish goes bad the price in the market falls. Therefore, fish may be:

- dip fried in oil for immediate consumption;
- sold live or freshly killed;
- preserved in ice;
- processed (sun dried, salted or smoked); and
- at higher industrial levels, it may be filleted and chilled for supermarkets or export.

The form in which the fish is marketed depends on:

- how near the market is;
- what the market prefers;
- the amount of fish to be sold; and
- the need to add value and improve profit.

3.1 Selling dip fried fish for direct eating
Fish may be dip fried in oil and sold for direct eating at social gatherings. Such opportunities include near schools, at drinking joints and at public functions.

3.2 Smoking fish in kilns
Fish may also be preserved by smoking in kilns, or salting, or by sun drying thus keeping for a longer time. This makes it possible to sell fish in longer distances.

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5. Agro-ecological zones
- Tropics, warm

6. Objectives fulfilled by the project
- Resource use efficiency