Table 1: Manure application rates for various organic fertilizers

Manure type	Dosage	Condition
Cattle manure	1000-1500g/m²	2 weeks prior to stocking
	500g/m²	1 week after stocking
Poultry	350g- 500g/m²	2 weeks prior to stocking
	150g/m²	1 week after stocking
Compost	50g/m²	2 weeks prior to stocking

Remember not to over fertilize the pond as this may result into shortage of dissolved oxygen in the water and this can be monitored from the greenish color of water.

RECORD KEEPING

There are many forms of record keeping which include;

- Production records like sales' records
- Financial records like salary payment records, input cost records
- Fish Management records like;
  - sampling records,
  - Feed records,
  - Fish growth records,
  - Fish health records.

BENEFITS OF KEEPING RECORDS

- Provide a basis for decision making
- They provide information on the performance of the fish.
- They provide a basis for farm credit and financing.
- They determine the relative profitability of the various production techniques and systems.
- They are important when carrying financial analysis of the aquaculture firm.
- They are important in providing management with an accurate list of products e.g. Date of harvest, Species reared, Amount harvested

PREDATOR CONTROL:

Farmer fish can be preyed on by fish eating predators like birds, monitor lizards, snakes, frogs to young fish and some of these like tadpoles can be a menace in the pond.

- Crawling predators may be controlled by fencing off the ponds with old nets or chain link,
- Liming for tadpoles already in the pond.
- Physically scooping out frogs and their eggs from the banks using a scoop net
- Keeping the grass around the ponds short and planting compound persperlum
- Setting traps easily controls monitor lizards and otters
- Tobacco has also shown success in keeping away snakes
- Strings, wires or nets are often used to cover ponds to prevent birds and pond water should not be allowed to drop to levels were birds like the marabou-stork can easily walk in the pond

HARVESTING

Harvesting should be at will and at ease. It's done by closing the inlet and bending the outlet pipe for the water to drain. For partial harvests, half the water can be drained, a seine net could be passed through the pond and when the desired number or weight of fish is attained then water can be refilled in the pond again. For total harvests, the pond should be drained leaving only a quarter of the total water volume, a seine net is then dragged and all water drained out leaving the fish to be removed using a scoop net.

N.B. Remember to harvest fish when there is ready market as these are perishable



A harvesting net spread out to dry. Demonstrating how a seine net works during a harvesting exercise

VALUE ADDITION

If fish is not sold fresh, it could be preserved by smoking using a fish kiln or packed fresh. Other products of fish include processing into sausages, samosas and dried to make fish powder.



15th Seeds of GOLD Farm Clinic

CLIMATE SMART FARMING

Aquaculture best pond management practices

7th /SEPT/2019
MUZARDI KAMENYAMIGO
MASAKA

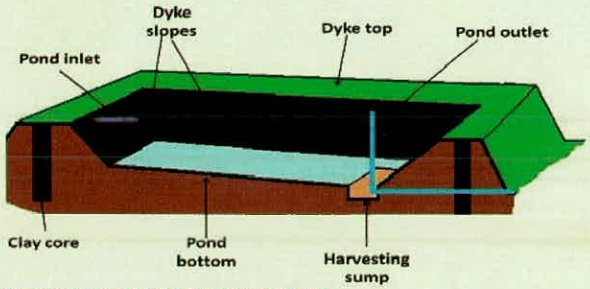


Mature harvested tilapia fish from a pond

Stanbic Bank
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Daily Monitor @dailymonitor www.monitor.co.ug

WHAT IS A POND?

This is a man made dug ditch purposely for rearing fish. For aquaculture to be successful, the pond should be made carefully with all the necessary qualities (Bad ponds can lead to poor performance or even failure).



PARTS OF AN EARTHEN POND

The site where ponds are to be constructed must be able to access continuous flow of good quality water allyearround. The water source can include; stream, spring, shallow well, Valley dam, Lake or river diversion. The best case scenario is to have ponds fill up by gravity flow. Any other means such as pumping can result into prohibitive operating cost.

Stocking: this is the act of introducing young fish into a pond or any other rearing unit

Seed: Good quality seed/fry/fingerlings regardless of the fish type should be of uniform size, be in good physical conditions with all body parts in the right shape, have a uniform color and should be lively. Ensure acclimatization of the new stock during stocking by allowing the fish to swim out of the transport unit into the pond by themselves.



Good quality tilapia fry

How much to stock: stocking depends on the management level that is being adopted on the farm. At low levels of management (this is most common) stocking densities range from 1kg per m2 to 4kgs per m2. Amount of stock is determined by the target weight to be harvested. For example, if one targets to produce 100kg of fish in a pond, the stocking density will be determined by the number and size of fish that will make 100kg at harvest.

Feeding: Fish feeding accounts for 55-65% of all the cost of production, hence, for sustainability and profitability of fish farming, good quality and affordable feeds are required. Fish requires a well balanced and nutritious diet to grow fast and stay healthy. There are two forms of fish feeds .i.e. Natural food and Artificial feed.

Table of commercially available feeds and prices per kilo

No	Feed Brand Name	% Crude protein	Pellet Size	Price per kilo	Price per bag
	Imported				
1	Koudjis (Kafika)	50	Powder(starter)	5,100	51,000 (10kgs)
		50	Crumble (0.5-0.8mm)	5,200	52,000 (10kgs)
		50	Crumble (0.8-1mm)	5,000	50,000 (10kgs)
		40	2mm	4,400	66,000 (15kgs)
		40	3mm	4,000	60,000 (15kgs)
		35	4mm	3,650	54,750 (15kgs)
		35	6mm	3,550	53,250 (15kgs)
2	Prime Feeds				
3	Ranaan	45	Powder	9,000	180,000 (20kgs)
		42	Starter (0.3- 0.8)	7,800	156,000 (20kgs)
		42	2.5mm	5,600	112,000 (20kgs)
		38	4mm	4,800	96,000 (20kgs)
4	Novatek	45	Starter (0.8- 1.2mm)	6,900	138,000 (20kgs)
		40	2mm	5,200	104,000 (20kgs)
		40	3mm	5,200	104,000 (20kgs)
		32	5mm	4,900	98,000 (20kgs)
	Local feed				
6	Ugachick	45	starter	4,430	88,600 (20kgs)
		40	crumble	3,840	76,800 (20kgs)
		35	2mm	3,600	72,000 (20kgs)
		30	3mm	2,635	52,700 (20kgs)
		25	5mm	2,505	50,100 (20kgs)
7	Mbarara ZARDI	40	Starter (0.3- 0.8 mm)	4,000	80,000 (15kgs)
		35	2mm	3,000	60,000 (15 kgs)

Sampling

In order to assess fish performance, a sample of fish from the ponds is weighed periodically, i.e. weekly for fish under 15grams and monthly thereafter. A sample is obtained by seining with a seine net and weighed using a digital weighing scale. It is then put in fish baskets. The weights obtained are converted into AverageBodyWeight (ABW) and compared from month to month. Note that the ABW should be increasing with increasing months of production



Taking measurements using a digital electronic weighing scale (L)

N.B A suitable sampling scale must be able to tare weight of water and container

Sorting and grading

This is the act of putting fish of similar sizes together. In a normal production, there are shooters that are usually first growers and these should be separated from other fish to another pond to reduce on competition for food, oxygen and space. Grading can be achieved using graders with bars or domestic baskets can as well be used.



Improvised graders - locally available plastic baskets can be used to perform the role of a grader. Varying size of perforations permit small size fish to go through leaving behind larger fish, hence attaining size separation

WATER QUALITY MANAGEMENT

A farmer has to ensure that the environment for fish is maintained with as low ammonia levels as possible but with enough natural foods for herbivores like tilapia. Through liming and pond fertilization all this can be achieved but keeping in mind that the pond water has to be moving. The ponds should and must be made with an outlet and inlet as these will ensure entry of clean water into the pond and used water out of the pond. Free water movement also reduces
toxicity.

Liming: lime can be added to the pond bottom when the pond is cleared of all the water or uniformly broadcast in the pond on the water surface. Calcium hydroxide and calcium oxide are best used after pond has been drained. Lime kills pond bacteria, kills tadpoles and aquatic insects, improves soil fertility and stops acidity and or alkalinity fluctuations.

Fertilization: organic and or inorganic fertilizers can be used. Application may be made 1-2 weeks prior to stocking. Fertilization boosts and increases natural food abundance and maintains it in recommended limits. Daily doses can be best applied at mid morning.