

# Aquafeeds Tilapia Farming Pond manual



This guide is designed for the farmer who asks 'How do I start fish farming?'. It is restricted to one simple scenario - a 200m<sup>3</sup> pond that will be stocked with 1000 tilapia. This simplified scenario will allow a farmer to successfully gain experience from which he or she may expand their fish activities.

### Site Selection



The choice of the site is important. The following criteria need to be followed.

#### Close to home

Keep the site close to home for security, ease of supervision and access.

#### Water supply

Ideal supply is continuous flow of clean warm water above the level of the ponds.

Can come from river, dam or borehole.

Free from contamination and pollution.

Must have access to water for the whole of the growing period.

Typically 1m<sup>3</sup> water is required per day to replace seepage & evaporation.

More water is preferred to

Fill the ponds for stocking.

Refill the ponds due to loss from seepage and evaporation.

In emergencies, to flush the pond if fish are dying.

#### Slightly sloping is ideal

When coming to harvest the pond, it will be necessary to drain it.

A slope will help to allow excess water to run off.

The pond must have a slight slope to the drainage end.

Rain water runoff should not drain into the pond.

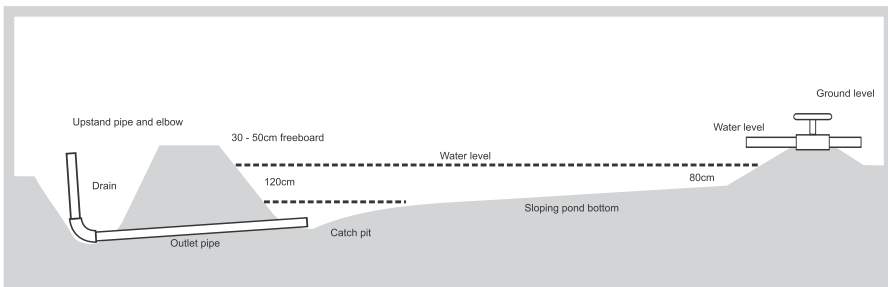
The area should not be prone to flooding.

#### Relatively clear land

It is much easier to construct and maintain a pond if the area is free from rocks and trees.



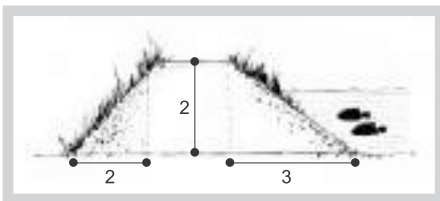
Excavate the pond area in layers. Take off 15 - 20cms at a time, going from shallow to deeper. Use the same soil to construct the dykes. Moisten and compact the soil from the pond area burying the lateral outlet pipe. Try to ensure that the base of the pond is clean and straight and has slight gradient ending at the pipe outlet position. Typically three passes will give an overall depth of 1.2m at the shallow end and 1.5m at the deeper end.



Level and compact the bottom of the pond and ensure that there are no hard and sharp objects on the pond bottom.

Ensure that the dykes are straight and leveled.

The dyke walls, the dimension ratio on the walls should be 1:1 (vertical horizontal) on the outside pond wall and 2:3 on the inside wall.



Dig a trench to install the lateral outlet pipe (tack with cement mortar). Ensure the catchment area of the outlet pipe is the lowest point of the pond. It is important that you are able to drain the pond completely. Stabilise the soil at the outlet with wooden supports.

Take great care to compact in layers of 20cm when backfilling the outlet trench.



1. Attach the bend to the lateral pipe.
2. Insert the upright outlet pipe (1.3m - 1.5m) this pipe controls water depth, used to protect the pond from over flowing and used to drain water from the pond when harvesting or changing water by tilting it.
3. The height of the upright pipe should be lower than the height of the dyke by 30 - 50cm. This is called freeboard.
4. Finish the dyke by covering with topsoil. Grassing the wall is encouraged to protect the walls from erosion.
5. Both the inlet and the outlet pipes should have screens to prevent foreign fish entering or your tilapia escaping.

### Managing your pond

Water is the most important component of your pond. The character of the water needed

	Min	Max	Optimum
Temp	15°C	33°C	24 to 28°C
pH	6	9	8
DO	3ppm	Saturated	Saturated
Turbidity	Clear	Elbow depth	< Elbow depth
Ammonia	0	0.05 mg/l	< 0.02 mg/l

Each time you go to use the pond (including initial stocking)

Fill the pond one month before stocking. Allow frogs and animals to spawn over a few days.

Check for any leakages and faults on drainage.

Drain the pond completely.

Remove excess silt and weeds and level the bottom. Do not remove grass, however, as it keeps the dykes stable. Grass should be kept short.

Spread 20kg of lime.

Allow the pond to dry and soil to crack.

Refill again 1 to 2 weeks before stocking.

## Observations to help you manage the pond

30cm test - if you can't see your hand when your arm is immersed to the elbow, stop feeding and change water as quickly as possible.

Pea Green colour observation - this is an ideal water pigmentation for natural fish feed to grow.

Feeding and oxygen levels are interdependent. Good levels of oxygen are necessary for the growth and well being of the fish. If the fish are gaping for air in the morning - this is a sign that the oxygen levels are low.



Causes for this can be...

Too many nutrients in the water, giving too much algae, which in turn is stripping the oxygen from the water. ACTION: Stop feeding for two weeks or exchange with fresh water.

Too many fish in the pond or the fish that are there are too big  
ACTION: harvest the pond.

Pale colour - another sign of stress in the fish is that the fish are pale in colour. ACTION: Improve water quality.

### Stocking

Stock with 1000 fish of size 1 - 2g. This is a density of 5 fish per m<sup>2</sup>.

Male populations perform better than a mixture of male and females. Request all male tilapia from your hatchery.

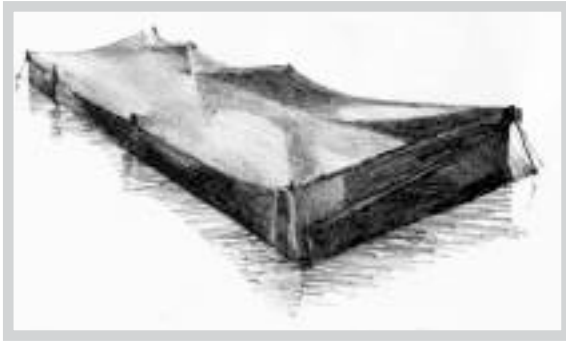
When receiving fish - first float the bag on top of the pond water for 15 - 30 min to acclimatise the temperature. Then little by little, let the pond water mix with the bagged water, until finally the fingerlings start swimming out of the bag into the pond. Rushing to release the fingerlings into the pond with a different water temperature range may shock the fingerlings.

### Juvenile fish in Happas

When you first receive your fish, place them in a happa size 2x 1 x 1m.

The fish should remain in the happa for 70 days.

The happa should be made from 50% shade cloth.



## Feeding

There are two methods of feeding. First is to use green water for 70 days (or when fish reach 50g) followed by commercial feeding. Alternatively use full commercial feeding from the start. When using commercial feed - always feed from the same place at the deeper end of the pond.

If using green water - put manure in sacks - do not throw into the pond directly. Recommended 20 to 40kg of chicken or pig manure. Can also add 2 to 4kg of 16-20-0 Ammonium Phosphate. Place in pond one week before stocking.

Thereafter the commercial feeding should be as follows...

Feed	Type	Duration	Kg Required	Feeds per Day	Fish Size
Juvenile 2	medium pellet	30 days	75kg	3	50 - 100g
Grower	large pellet	100 days	450kg	3	100 - 300g

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For full commercial feeding, the feeding regime should be as follows...

Feed	Type	Duration	Kg Required	Feeds Per Day	Fish Size
Starter 2	med. crumble	20 days	5kg	8	1 - 5g
Starter 3	large crumble	20 days	10kg	6	5 - 15g
Juvenile 1	small pellet	30 days	50kg	4	15 - 50g
Juvenile 2	medium pellet	30 days	75kg	3	50 - 100g
Grower	large pellet	100 days	450kg	3	100 - 300g

The feeding regime described above is a guide only. Always feed to a response. When feeding commercial feed - always feed from the same point. Feed less at the start of the period, gradually increasing as the fish grows. Feed slowly - do not dump feed. Cast the feed gently to allow a greater area for the fish to find the feed - but keep it controlled.



Do not feed fish if they are gaping.  
Expect feeding response and therefore the amount you feed to be a bit less on overcast or colder days.  
Do not feed in the dark.  
Do not overfeed. Indications of over feeding are...  
    Uneaten feed  
    Undigested feed in the faeces of the fish

## Harvesting

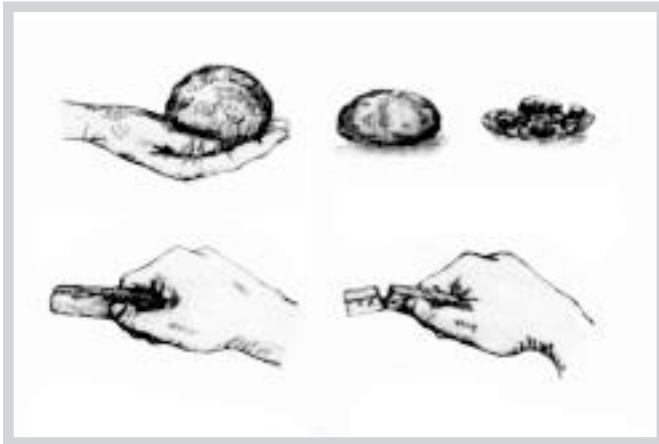


Preferably harvest early morning when the water is cooler.  
If possible, freshen the water for 2 to 5 days before the harvest. Stop feeding for 2 days before the harvest.  
It is recommended to completely harvest the pond at one time. Pass a seine net of size 15m x 2m, with 1 - 2cm mesh size, through the pond 3 to 4 times to catch all the fish. Drain the pond and catch any remaining fish.  
If it is necessary to partially harvest, use a seine net or cast a net over a portion of the pond. Harvest all the fish caught in this process. Fish that are caught and released will suffer from stress and may die.

### **Soil Ball Test**

Take some of the soil dug earlier from the bottom of the hole.

Wet it slightly and form it into a round ball, slightly bigger than the size of a fist. Drop the ball from head height onto flat ground, if the ball retains its shape or goes only slightly out of shape it has enough clay content and is thus good for pond construction. A ball made from soil that is too sandy will flatten out, crack open, or even shatter on impact with the ground. Alternatively, if the ball remains intact and does not crumble after considerable handling, there is enough clay in the soil.



### **Soil Ribbon Test**

Take some of the soil dug earlier from the bottom of the hole.

Wet it slightly and attempt to mould it into a flat ribbon of earth about 3cm wide and 6mm thick. If the moist soil forms into a ribbon of these dimensions, the soil has enough clay content. If the ribbon cracks and falls apart, the soil is too sandy and unsuitable for pond construction.

### **Fish health**

Report any strange swimming behaviour of fish.

Flashing or rubbing of fish may show that the fish have some parasites. If you have to move or handle a fish, use some salt. A handful of salt may be applied to a container of 70 litres.



### Record Keeping

Pond ID

Pond Area

No. of fish stocked

Date of fish stocked

Source of fish

### Feeding

Date from	Date to	Type of feed	kg of feed per day

Total No. of fish caught

Average weight or length of fish

Selling price

Total sales

Total feed used

Total cost of feed

FCR

Growth

Survival%

Other costs

Labour

Transport

Utilities

Fees

Overall profit

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