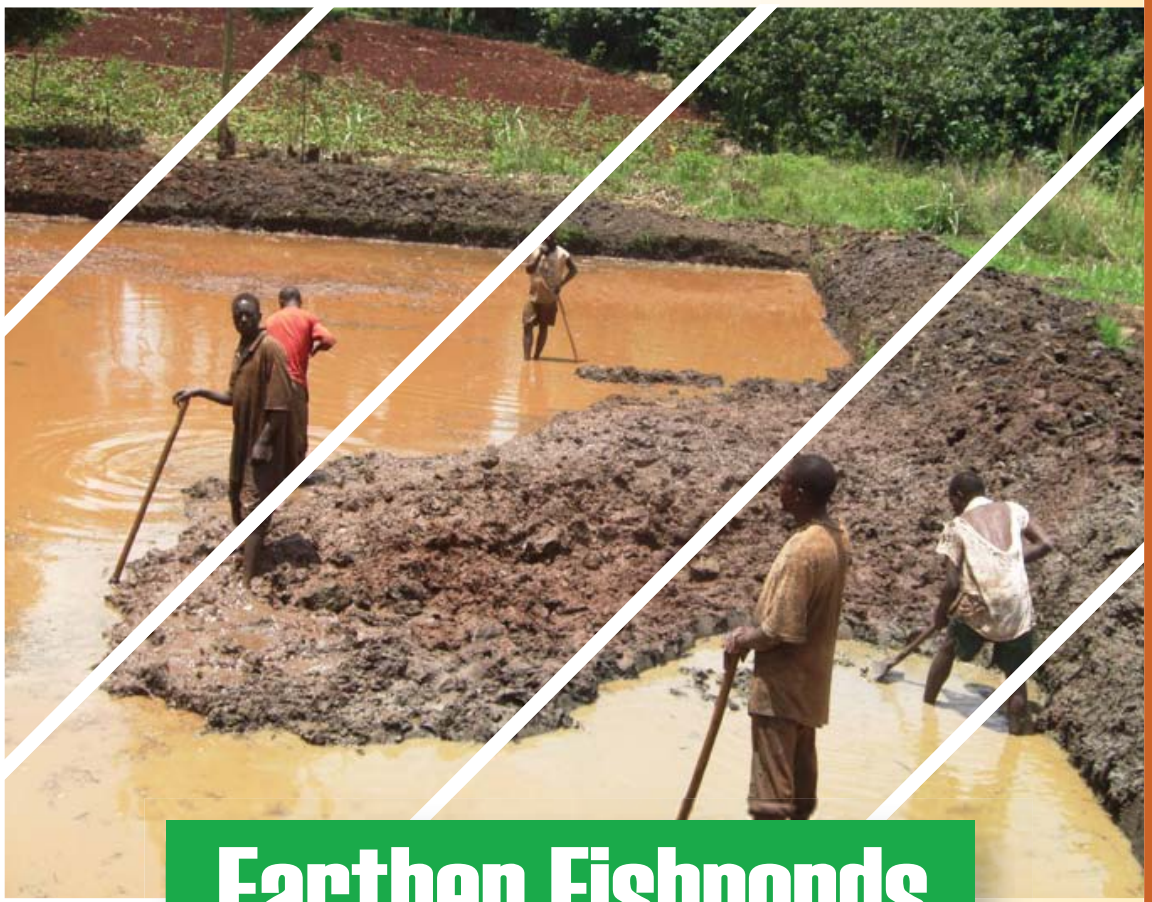
Pond Construction



Earthen Fishponds

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Pond Design and Construction

You should make final decision on where to construct a pond by visiting the site. At the site, start checking the slope or elevation from feeding canal using level and twine. This helps in understanding how water will flow from the pond to the drain or back to the river.

Remember we all need permission to take water from public waters so we need to check with the water authorities if we plan to remove water from a stream, river or other source that is shared by members of the community.

Take note that the elevation of inlet to the pond and outlet to the draining river controls the drain in the Pond. This means that the topography (layout) of the land must be determined first.

Gentle slope while avoid erosion of canal and dykes but if too gentle then most silt settle in canal and not in the pond.

Too much canal slopes will cause erosion in canal while too little leads to siltation. Also, too much slope results to loss of good soil for pond building but for big ponds it is about 0.5%.

If your wish is to drive between ponds, construct dykes that are at least 3 metres top width. Canals slope generally ranging from 0.25% to 1%. Once you have designed your pond there is a logical sequence of steps that you should follow to build it. These are:

1. Select a Temporary Bench Mark (TBM). If there is an existing pond use that as the reference point to get the heights of your dykes. If no existing ponds, use inlet and/or outlet canals.
2. Decide on the size of the pond and peg the pond area.
3. Decide on the dyke slope and width.
4. Now set out to peg the inner toes maintaining the dyke heights.
5. Cross check your levels to correspond with the TBM so as not to loose the dike height. You can also check your pond diagonally widthwise and lengthwise.
6. If all is fine, then excavate the pond bottom taking note of how and where the soils removed from the pond bottom will be transfer. Poor organization in soil movement increases labour cost and also ends up with a poor shaped pond.

How will I decide on the dimensions of a pond?

A pond of say 20m by 10m with a dyke slope of 1:2 should have a shallow end 50 cm and a deep end of 75 cm this size of pond will require a free-board of 30 cm. The total depth of such a pond on the shallow end will be 80 cm while its total depth towards the outlet will be 105 cm.

Absolute minimum for shallow end is 40 cm deep, but one can go 40 to 70 cm for shallow end, the best, however, should be 50 to 60 cm.

The deep end should preferably be 80 to 120 cm, and but the best is 90 to 110 cm. Freeboard for small ponds range between 20 t0 30 cm, big ponds should be up to 50 cm while for dam it is about 1 metre.

Table 1: (Below)
Showing the relation between percentage slope of the land and the estimated depth required to construct an earthen pond

	100m	10m	5m	1m
1%	1m	0.1m	0.5m	0.01m
0.5%	0.5m	0.05m	0.025m	0.005m
0.25%	0.25m	0.025m	0.0125m	0.0025m

The problems with shallow ponds include: predation, weeds and low production. You need a drop of 10 cm from inlet pipe to water level if you wish to avoid fish swimming out of pond into the pipe and/or use a screen to prevent fish from moving into the pipe or swimming upstream.

Remember that sunlight at the beginning goes up to 1 metre in a non fertilized pond thereafter and more often it rarely reaches beyond 60 cm from the water surface. Any area below one meter is likely to be less productive is cooler than the surface, does create stratification, is low in oxygen and most fish will avoid it. Since labour went into excavation this area, it is a loss to the farmer.