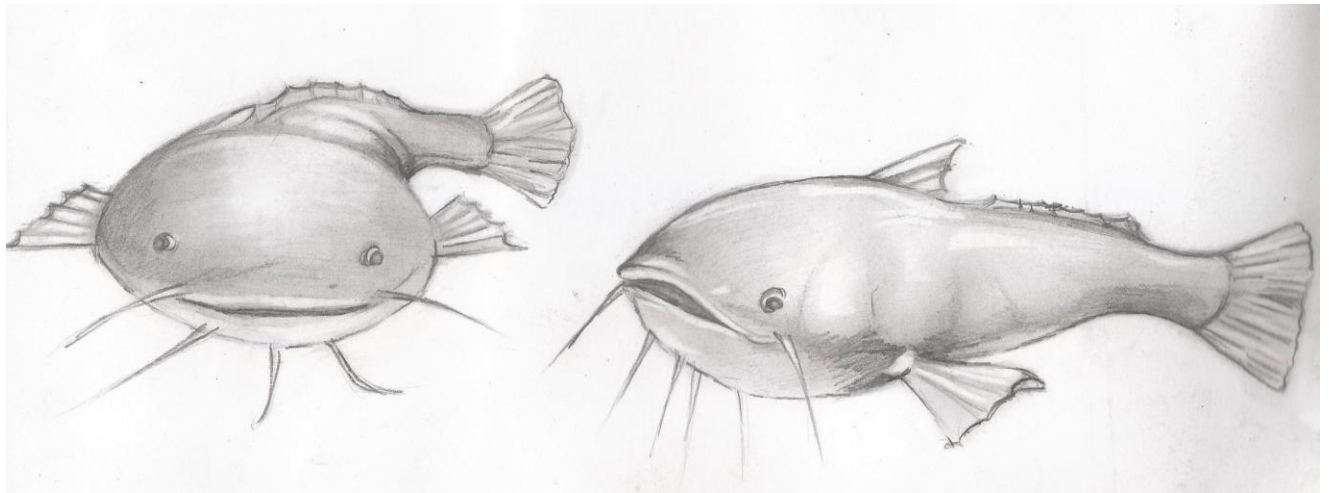


— **SMALLHOLDERS STEP-BY-STEP SERIES** —



FISH FARMING AS AN ENTERPRISE

TRAINING PAMPHLET

DEVELOPED BY THE

 **SMALLHOLDERS FOUNDATION**

".....for small farmers to overcome poverty"

**VERSION 1
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FORWARD

Nigeria has great potential to become an agricultural powerhouse. 70% of our great landmass is suitable for agriculture, yet only 30% of the land is currently used for cultivation. Nigeria's diverse climate, from the tropical areas in the South to arid zones in the North, allow the cultivation of virtually all agricultural products grown in the tropical and semitropical regions of the world. There is thus abundant opportunity for growth and expansion.

The agricultural sector contributes 70% of labor force, 80% of consumed food, but only 40% of gross domestic product (GDP). 90% of agricultural production is produced by smallholders with the average farm size in the South reaching about 0.5ha and in the North 4ha. Subsistence smallholder farming thus continues to dominate the sector.

Fish farming as an enterprise is one of the numerous approaches which will successfully transform Nigeria's subsistence agriculture.

This training pamphlet which is part of our "easy to read and understand" Smallholders Step-by-Step Series is to:

- Equip farmers with "quick-win" skills to keep high quality fish,
- Equip farmers with "quick-win" financial skills to generate profit from fish farms,
- Encourage non-farmers to establish viable fish farms easily.

I will like to acknowledge the immense contribution of Mr. Chukwudi Precious, Programs Officer of The Smallholders Foundation. Chukwudi's focus is on re-engaging smallholder farmers to gradually move up the ladder from subsistence agriculture to a more commercial agriculture.

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Fish farming is a critical form of aquaculture that is gradually gaining wider acceptability. More than 30 percent of all the fish consumed each year are now raised on land-based or ocean based aqua farms. According to the United Nations Food and Agricultural Organization State of World Fish and Aquaculture 2012, aquaculture industry is growing three times faster than land based animal agriculture. There is an increase in the demand for fish and fish protein, which has resulted in widespread overfishing in wild fisheries.

Fish farming is a very cheap and reliable source of income generation. It makes use of available land and water resource and it's convenient to practice within living environments. In Nigeria fish farmers' normally stock, fish living in the fresh water and brackish water.

Fishes found in Nigeria's fresh water are:

- ❖ Bighead carp
- ❖ Grass carp
- ❖ Pangas catfish

Fishes found in Nigeria's brackish water are:

- ❖ Tilapia
- ❖ Marble goby
- ❖ Flat head grey mullet

Steps in farming fish

Site Selection - When selecting site for homestead fish farming. Please try and select sites near the house for easy accessibility and security

Step 1: Select sites close to the house

Pond Construction - You can use any pond such as earthen pond, concrete or plastic. The use of any type depends on the nature of the soil type and amount of money you have. For example earthen pond is very cheap to construct but limited to areas where there is clay soil, underground or water nearby water source.

In concrete homestead a surface area of 5m x 5m x 5m with 1.5m depth can be constructed. The floor is made 7.5cm using cement. The floor is sloped towards the side of the pond for the draining of the pond. Concrete ponds are recommended but they are expensive. Plastic containers can also be used. Plastic containers of 5 feet by 5 feet are suitable for the ponds.



Concrete pond is very good for backyard fish farming

Step 2: Concrete pond is recommended for homestead farming

Pond preparation - After plastering the construction you need to wash off the cements or you may lose your fish fingerlings to the alkalinity from the cement dust. The pond should be limed (CaOH) to neutralize the acidic effect of cement and to predispose pond water to effective fertilization. You should use the agric-lime at the rate of 250-500kg/ha. Sometimes wood ash at the rate of 2500-5000kg/ha may be used as alternative. After application it should be allowed to stay 5-7days before washing it off with good water.

Step 3: Neutralize the acidic nature of cement by applying agric-lime 250-5000kg/ha or woods as and wash it off with water after 5-7days.

Treatment of pond water - The pond water should be fertilized with organic or inorganic fertilizers. This method provides the nutrients needed for the rapid development of phytoplanktons and zooplanktons. You should apply 225-250kg/ha by broadcasting. For organic apply a total 400-750kg/ha of poultry waste or 500-1000kg/ha of cow. The waste should be placed in a sack bag and lowered into bottom corners of the pond. The bags are removed after 6-10days when the water has turned greenish in color.

Step 4: Apply fertilizer or manure to help phytoplanktons and zooplanktons plants to grow in the pond.

Selecting fish to stock - Catfish are recommended during stocking for commercial purposes namely: *Clarius gariepinus*, *Hetero claries*, and *Heterobarchus bidorsalis*.

Step 5: Stock catfish for commercial purposes

Sourcing fingerlings - It is recommended to source fingerlings that are 3-4 weeks old ahead of stocking date. You can source through government agricultural departments, private hatcheries, Nigeria Institute for Oceanography and Marine Research Lagos, African Regional Aquaculture Center, Port Harcourt and some other fishery stations.

Step 6: Contact state ADP, ministry of agriculture more information and help.

Stocking - Air and water volume should be considered when stocking otherwise the reverse might be the case and all efforts become a waste. Concrete ponds should be stocked at the rate of 30-40fingerlings/m² for one type of fish (monoculture). For polyculture 1 tilapia 4 catfish is required. 50-60fingerlings/m² are recommended for earthen pond.

Step 7: The higher the volume of water the higher the stocking rate.

Feeding - Fish feed are used as supplementary food materials to add to the algae, zooplanktons and phytoplankton that grow in the pond. Unconventional feeding can be done using worms, flies, termites and maggots. Fingerlings are fed daily according to their body weight. It is required to measure out feed equivalent to 3-5% of their weight. This will be the feed needed for the whole day. Divide this quantity into equal portions between 3-5 times at regular intervals. Put feed at the four corners of the pond.

Step 8: Measure out feed equivalent to 3-5% of their body weight

Pond management - The water in the pond should be changed when it is having too much greenish colour with spots of foams. Aerate the pump regularly by pumping water into it while allowing waste water to overflow pipes. After 2 months of stocking, sort your fish and move bouncers or shooters into another pond to avoid cannibalism.

Step 9: Change polluted water with fresh water and aerates the pond after one week of changing water.

Cropping and marketing - You should conduct a trial harvest to decide when your fish is due for harvest, normally this is when they are weighing 1kg or above. For your marketing, you will need packaging materials, weighing scales, record books, flyers and handbills for local advertisement and if necessary your farm business cards. It is always advised to advertise product through oral negotiation with hotels, restaurants, club houses, families and fast food joints to ease the drudgery involved in selling fish.

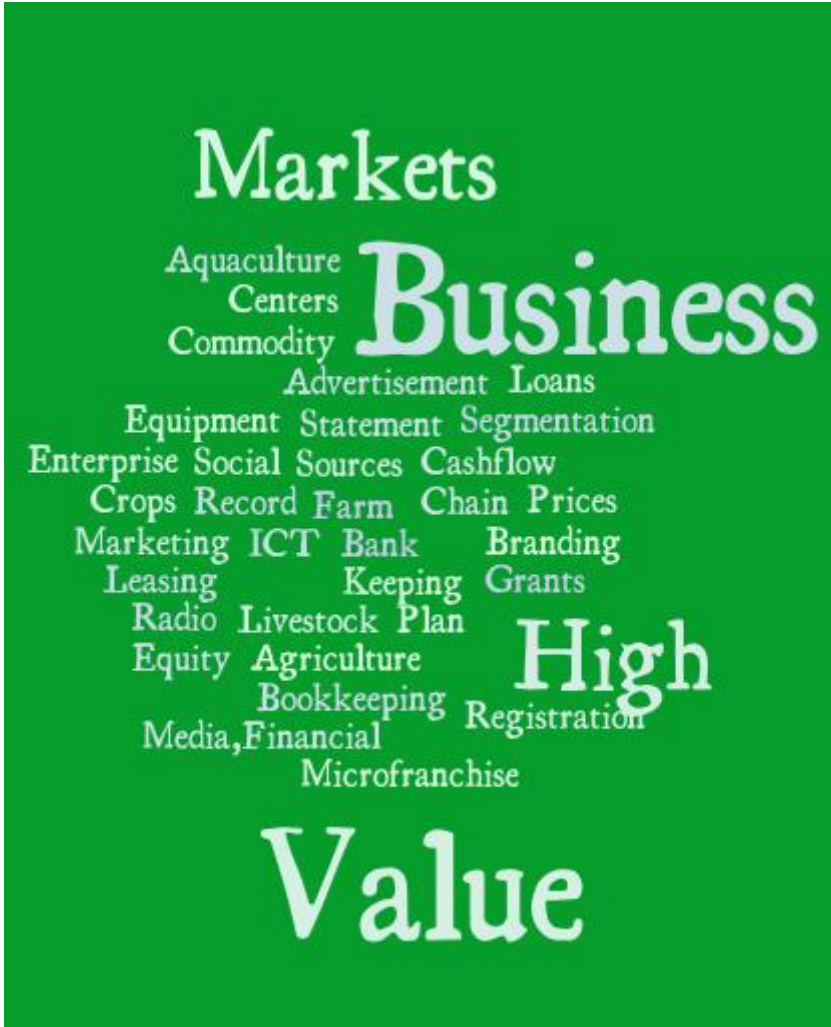
Step 10: Test crop your fish and advertise.

Tentative Cost to establish 1 hectare of Fish Farming Enterprise

Items	Qty	Unit	Unit Price N	Value N
Cost				
Fingerlings (catfish)	1100	No	50	55,000
Plastic Tanks	2	Litres	5,000	10,000
Fertilizer NPK	1	Bag	3800	3800
Borehole	1	Horsepower	150,000	150,000
Generating Set	1	KV	30,000	30,000
Fuel	120	litres	95	11,400
Total Cost				260,200
Income				
At 5% mortality	1000	No	600	600,000
Total Income				600,000
Profit				339,800

REFERENCES

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