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**Fish farming — Code of practice — Part 2:
Farming in ponds**

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Foreword

Rwanda Standards are prepared by Technical Committees and approved by Rwanda Standards Board (RSB) Board of Directors in accordance with the procedures of RSB, in compliance with Annex 3 of the WTO/TBT agreement on the preparation, adoption and application of standards.

The main task of technical committees is to prepare national standards. Final Draft Rwanda Standards adopted by technical committees are ratified by members of RSB Board of Directors for publication and gazettment as Rwanda Standards.

DRS 608-2 was prepared by Technical Committee RSB/TC 036, *Fish and fish products*.

DRS 608 consists of the following parts, under the general title *Fish farming — Code of practice*:

- *Part 1: Farming in cage*
- *Part 2: Farming in ponds*

Committee membership

The following organizations were represented on the Technical Committee on *fish and fish products* (RSB/TC 036) in the preparation of this standard.

Rugali meat processing

Ministry of Agriculture and Animal Resources (MINAGRI)

Res Populi Ltd

Rwanda Inspectorate, Competition and Consumer Protection Authority (RICA)

National Industrial Research and Development Agency (NIRDA)

MINIMEX Ltd

Coopérative pour la Promotion de Pêche et des Activités de Vente d'Isambaza (COOPPAVI)

Rwanda Standards Board (RSB) – Secretariat

Fish farming — Code of practice — Part 2: Farming in pond

1 Scope

This draft Rwanda standard specifies guidelines and recommendations for fish farming in ponds.

2 Normative references

There are no normative references in this document

3 Terms and definitions

For the purposes of this standard, the following terms and definitions apply

3.1

pond

small, shallow body of still water formed by artificial means for fish farming purpose

3.2

fish

any of the cold-blooded (ectothermic) aquatic vertebrates. Amphibians and aquatic reptiles are not included.

4 Farm site selection and design

4.1 Location

4.1.1 A pond should be placed in place with a gentle slope or on a hillside so you will not have to dig too much soil to build it. A pond built on a slope is also easier to drain. Ponds should not be built in a place that is so low that it can be flooded during the rainy season or on a steep hill.

4.1.2 Soil chosen for pond building should be clay, not be too sandy to hold water. In clay soil, very little water will sink into the ground, and banks of clay will be strong enough to hold the water in the pond.

4.1.3 A pond fish farm should be near a good supply of water such as a spring, stream, lake or reservoir with plenty to fill your pond when it is time to fill it and to add more water when you need it. Rainwater should not be depended on to fill the pond. When it does not rain, there may not be enough water to keep your pond full and the fish may die. water must come from a place that is higher than the pond so that the water will flow into the pond by itself.

4.1.4 Preferably, ponds should be built in a place which has an access to good roads to allow easy transportation of materials needed for fish farming and transport of finished products.

4.1.5 A location should be chosen where drainage from domestic sewage, polluted water from industrial waste and agricultural chemicals will not drain into the ponds.

4.1.6 A license should be obtained from competent authority for fish farming in pond in that area.

4.2 Farm Design

4.2.1 A square or rectangular pond is recommended since it is the easiest to build, but the pond can have a different shape to fit the size and shape of the land it is built on.

4.2.2 Guidelines on pond building should be obtained from competent authority after approving the selected location.

4.2.3 Water inlet should have a screen to keep out wild fish, dirt and trash when you fill the pond. Water outlet should have a screen to keep farmed fish from getting away when you empty your pond

5 Pond Farm management

5.1 Cleaning and general maintenance of the fish in pond

5.1.1 Before filling the pond, the screens on the inlet, outlet and overflow should be in place and tight.

5.1.2 The pond should be disinfected with quicklime. Before disinfecting, the pond should be filled with water to 6 to 10cm deep. Apply lime (CaO) for the pond bottom at 10-15 kg/100 m². One week after liming, ponds are ready to be filled with water.

5.1.3 Weeds should not cover more than one quarter of the pond's surface. If there are too many weeds, the pond should be cleaned by cutting the weeds and grass on the banks of the pond.

5.1.4 Large animals such as cows should not be allowed to graze on the banks of the pond. Since they are too heavy and can break the banks down. However, smaller animals such as goats and sheep may graze on the banks and keep them clean.

5.1.5 Pond should not be used for bathing or for washing clothes, dishes or cooking

5.1.6 There should not be big trees near the pond. If there are already big trees there, branches that hang over the pond should be cut. The water in pond may not turn green enough if the pond is in the shade.

5.1.7 Farmers should immediately notify the competent authority of any unusual symptoms, fish mortality or other negative behaviors to ensure quick response and prevent further spread.

5.1.8. In case of any sign of disease is suspected, Regulatory authorities should be involved in all treatments.

5.1.9 When necessary to use drugs, only permitted veterinary drugs and chemicals should be used in consultation with competent authorities.

5.1.9 All workers should be free from any contagious disease. This should be ensured through periodic health screening of workers.

5.2 Water quality management

Water quality parameters that should be closely monitored in the aquaculture industry include temperature, dissolved oxygen and pH. To maintain them the following should be done:

- a) Maintain pond water at green color. Too deep green color should be avoided;
- b) Avoid causes of low dissolved oxygen brought by excessive fertilization of ponds, Excessive feeding rate, and overcrowding with high stocking densities;
- c) If symptoms of low dissolved oxygen are detected when fish come up to the water surface to gasp for air take immediate action. Stop fertilization, decrease feeding rate, renew water completely or replace it with fresh oxygenated water;
- d) Prevent run-off water which may contain silt, clay or sand which clog gills and cause Anoxia or pollutants from entering the pond;
- e) Prevent toxic pollutants from entering your pond by proper site selection. Locate ponds away from industrial centers, oil fields and chemically treated agricultural farms;
- f) Maintain water depth at 1 – 1.5 m;
- g) If you find any dead fish floating in your pond, take them out right away. Change some of the water in your pond.
- h) If you see anything wrong with your fish that you do not understand, stop feeding them and stop using fertilizer. Then change some of the water in your pond every day for several days. If it does not get better, contact competent authority for help.

5.3 Record keeping

All the major activities of the farm, records of employee, culture operation, input use, disease incidence, fish growth, harvest and sale records should be maintained.

5.4 Disease and pest control in the pond

Pond monitoring should be done regularly to identify potential problems early and prevent the development of full-scale disease or parasite problems. If there are signs of fish disease, specialized professionals, veterinarians or fish farming extension agents should be called for help. Some preventive measures that should be taken are:

- a) Dry and treat your pond after each culture cycle, destroy all pests, animals and plants in the pond area.;
- b) Apply lime to your pond soil, even if you do not need it to manage soil pH or water alkalinity;
- c) Keep weeds cut back in and around your pond, ensure the water supply structure (Inlet) is properly screened to prevent entry of wild fish;

- d) Stock sizeable fingerlings (minimum 5 grams) to make it impossible for flogs to feed on them;
- e) Stock good quality healthy and disease-free fingerlings obtained from a known-reputable source; and
- f) Avoid overcrowding of ponds

6 Fish seed/fingerlings stocking

6.1 Fingerling should not be transported in the seine net. They should be carried in a container such as a clay pot with a cover, a bucket with a lid or a plastic bag with only clean water. Fingerlings should be kept out of the sun or covered in the container with a wet cloth to keep it cool. Air should be allowed in time to time by splashing the water gently with hand.

6.2 Stock fingerlings with similar size in the pond. The size of fingerling should be more than 5g to increase survival rate. Two to four fingerlings for each square meter of pond may be stocked.

6.3 The water temperature in the transfer container (plastic bag, bucket, tub, etc.) and that of the pond water should be equalized before putting gently fingerlings in the pond.

7 Feeding

7.1 Feeding the fish

7.1.1 After filling the ponds with water, the water should be kept green by fertilizing it with Compost made with plant and animal wastes, animal manure or plant material each week. Since the big fish in pond get much of their food from small plants and animals that grow in the green water. Manuring must be stopped 15 days before harvest.

7.1.2 Fish should be fed regularly. If plant compost or plant material is used, keep the crib filled to the water line. If animal compost or manure is used, add on 10 to 15 kg of manure per month.

7.1.3 For fish to grow more quickly, they should also be fed other kinds of food. they may feed on agricultural by products such as rice/maize bran, slaughterhouse wastes, spoiled fruit and vegetables, chopped grass, etc...

7.1.4 To determine how much the fish should be fed, the number of fish in the pond should be known. The total quantity of supplementary feeding to be given daily to the fish in a pond is expressed as a percentage of the total weight or biomass (B), of fish present. This percentage is called the daily feeding rate (DFR). Table 2 below determine the amount of feed that should be given to fish each day.

Table 2 Dailly feeding rate

Fish Average weight(g)	Feed applied daily (% body weight)
15 – 20	10 – 7.0
21 – 50	7.0 – 4.0
51 – 100	4.0 – 3.5
101 – 250	3.5 – 1.5
251 - 450	1.5-1.0

7.1.5 Feed should be farm-made or sourced from feed manufacturers approved by competent authority.

7.1.6 Fish should be fed at least once a day same time everyday preferably early in the morning and late in the afternoon when it is cooler. Fish should be fed from the same position and time each day for each pond. Fish should be fed from the shallow end of the pond to ensure their visibility while eating.

7.1.7 Fish should not be fed at least two Days before harvest and transportation, on the Sampling Day, when treatments are applied to the Pond or when Water Temperatures are Low on rainy Days.

7.1.8 Fish should not be over fed since too much uneaten food on the bottom of the pond will make the water become bad.

7.1.9 Fish should be fed using pelleted fish feeds either floating or sinking. The feed size and protein requirement for fish of different sizes are given in table 3 below

Table 3: Fish feed size and protein requirement

S/N	Life stage	Fish weight(g)	Feed size (mm)	Protein requirement (%)
i.	First feeding-larvae	-	powder	45-50
ii.	Fry	0.02-1.0	powder	40
iii.	Fingerlings	1.0-10.0	powder	35-40
iv.	Juveniles	10.0-25.0	1/3	32-35
v.		25.0-70	1/3	30-32
vi.		70-100	3	30-32
vii.		100-200	3	30-32
viii.	Adults	>200	4/5	28-30

7.2 On-Farm Fish Feeds Handling and Storage

Only the quantity of diet that will be consumed within 4 to 6 weeks should be purchased. Diet should be stored in a cool, shaded, dry and well-ventilated room and should not be stacked directly against a wall or on a concrete floor. They should be Stack on pallets off the walls of the building to prevent moisture coming in contact with the bags. Pesticides or other toxic materials should not be used near the feeds. Diet that has been moulded or spoiled should not be kept or used.

8 Harvesting

Fish should not be taken out of the pond during the first five months. After five months you may catch a few big fish each week. When most of the fish are big enough you should harvest all of them. Usually, they will be big enough to harvest in about six to eight months. Applying fertilizers should be stopped one to two weeks prior to harvesting. Feeding should also be stopped two days before harvesting.

Harvesting the fish should be done early in the morning when it is cool. You may harvest by draining the water out of the pond by partially draining the pond very early in the morning on the day of harvest. A seine may be used for harvesting. seining should start in the shallow end of the Pond towards the deep end working carefully, disturbing the pond bottom as little as possible. The seine should be loosened somewhat to avoid crowding the fish too much during handling. Gradually lower the water as you near completion of the harvest.

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- [1] fish farming in ponds, Rwanda Agriculture and Animal Resources Development Board (RAB), 2020

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