Types of fish farming

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Types of fish farming.

Fish farming can be broadly divided into two types:

1. Conventional fish farming.
2. Non-conventional fish farming.

Non conventional fish farming includes:

a) Sewage fed fisheries
b) Paddy-cum fisheries.
c) Integrated fish farming.

(a) Sewage fed fisheries: The term sewage loosely includes combined liquid waste discharge from all domestic, municipal and industrial sources. Sewage water quality includes high BOD; Low dissolved Oxygen, High Carbondioxide, NH3, Hydrogen sulphide, high bacterial load etc. Sewage must be first treated using mechanical treatment like skimming, sedimentation etc, Chemical treatment for coagulation/chemical precipitation, de-odouration and disinfection, biological treatment for oxidation, reduction of organic matter, removal of unwanted microbes etc. The treated water are then stored and used for fish culture. This method is used in many Asian countries including India, Middle East, Germany etc.

TECHNOLOGIES ADOPTED BY FARMERS FOR CULTURING OF FISH IN SEWAGE

1)Pond preparation

Fig. 12 (a) Sewage fed ponds are pumped out to dry.

Fig. 12 (b) Drying of ponds is undertaken during winter.

Fig. 12 (c) Sewage fed fishponds; locally called "Bheries" have a bamboo sluice structure to prevent the entry of wild fishes and escape of the stocked fishes.

PROCESSES ADOPTED FOR SEWAGE TREATMENT BEFORE RELEASING IN FISH POND

Sedimentation The function of sedimentation is to remove suspended solids from sewage to the maximum possible extent by two successive stages primary (to settle down most of the heavier solids) and secondary (to help in mixing and flowing).

Dilution A positive DO balance is maintained and the concentration of harmful ingredients such as CO_2, H_2S, NH_3 etc can be kept below lethal limit by introduction of sewage in a freshwater body in various proportions like 1 parts of sewage to 5 parts of freshwater or 10 parts of freshwater with 4 parts of sewage are practiced.

Storage The oxygen required for biochemical reaction is obtained from freshwater so sewage is stored with freshwater for few days to oxidize the organic matter which make the fluid fit for pisciculture.

ADVANTAGES

1. The sewage fed fish culture uses the waste recycling process and maintains the good environment around the urban area.

2. Manuring and supplementary feeding is not required due to high content of nutrients in sewage.

3. Input cost is very low and production is very high.

4. This is the biological method of treating waste water before its final disposal in river.

DISADVANTAGES

1. The sewage contain high load of organic and in organic matters and toxic gases which may harm fish consumers.

2. As the raw sewage is used in fish ponds, there is a chance of infection and pollution to enter into human body through food chain. But this risk can be minimized if good managerial practice is followed.

(b) Paddy cum fisheries: Paddy field retains water for 3-8 months in plains. So, utilizing this temporary habitat we can easily harvest fish with paddy. Several conditions have to be available for this method, some are:

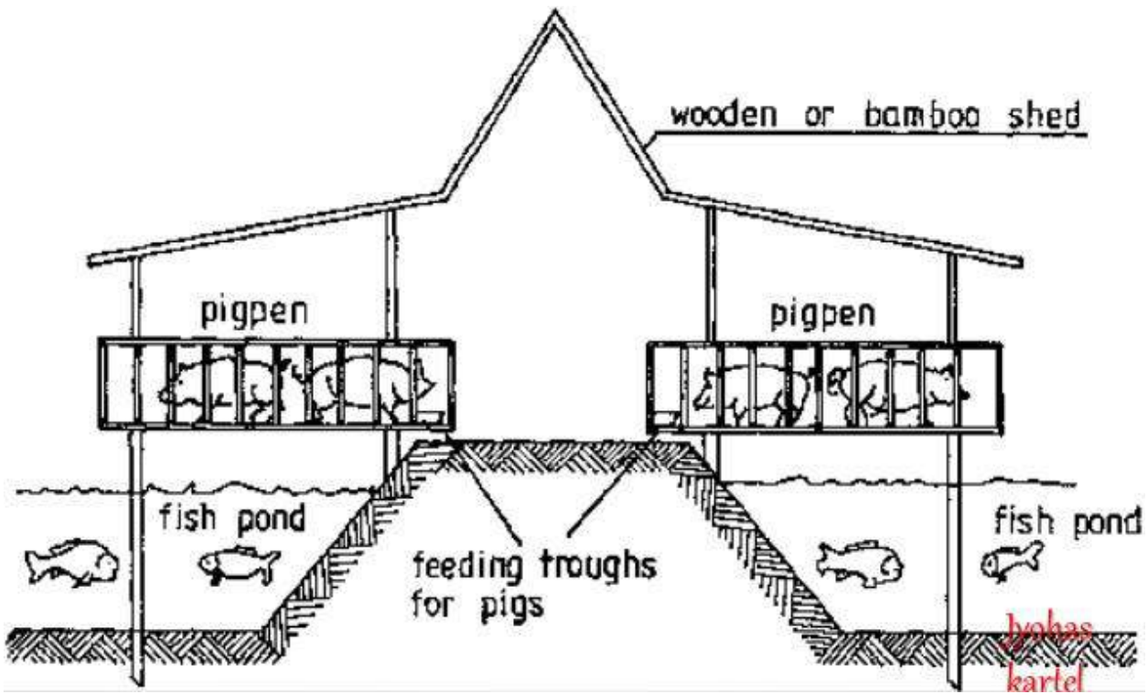
a) Strong dykes
b) Presence of channel and ditches
c) Presence of small pond or swamp for the fishes to escape the extreme heat and predatory fishes.
d) Deep water tolerable paddy.
e) Fish species should be tolerable to extreme environmental condition like temperature, high turbidity, etc. They should be able to grow to a marketable size in a short time.
f) Paddy should not be treated with insecticides.

(b) Integrated fish culture: Fish, crop and animal husbandry are carried in this method. Crops like alfalfa, rye grass, elephant grass, wild grass, soyabeans, barley, zee mays, sweet potato, bananas, rice, papaya etc can be cultivate. Along with cattle, goat, sheep, pigs, chicken, goose, koel etc.

An integrated approach of composite fish culture together with compatible combination(s) with poultry, duckery, pig rearing and cattle raising is now being adopted. Under this system of farming small livestock and farm yard animals, viz. pigs, poultry, ducks, etc., are integrated with composite fish culture by sitting animal housing units on the pond embankments in such a way that the animal wastes and washings are diverted into fish ponds for recycling. The fish not only utilize spilled animal feed but also directly feed on fresh animal excreta which is partially digested and is rich in nutrients. Surplus excreta support the rich growth of planktonic fauna.

(i) Integrated fish - pig farming

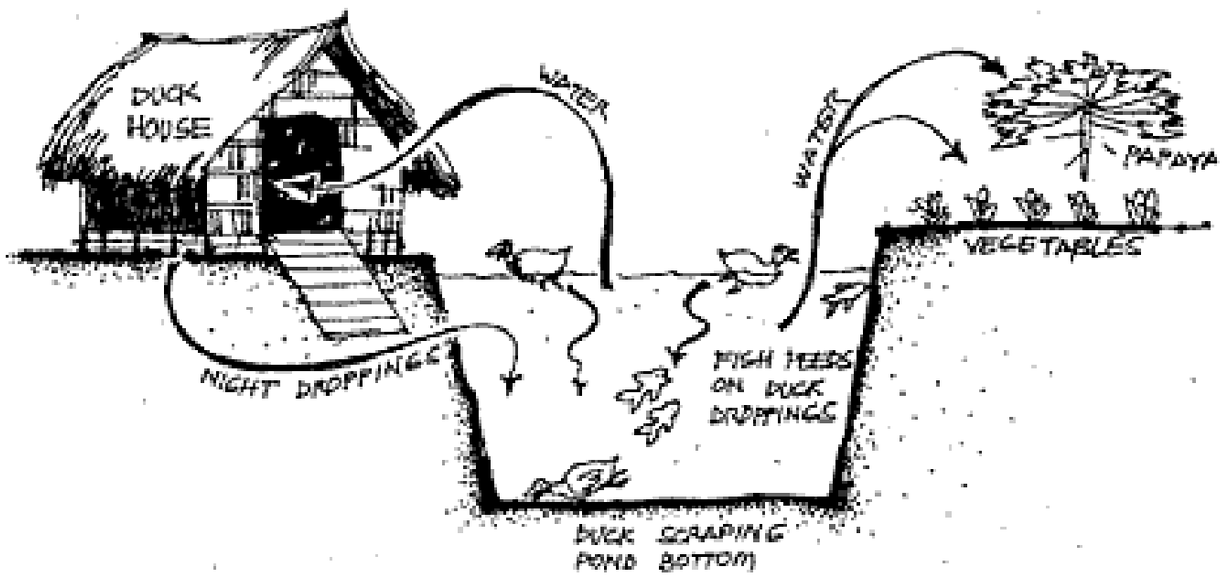
Pig styes are constructed either on the pond embankment or near the pond to facilitate easy drainage of waste directly into the pond which acts as pond fertilizer and supports dense growth of natural fish food organisms. Besides, fish also feed directly on the pig excreta. No other feed or fertilizer is applied to the pond. A pond is prepared by following the usual pond preparation techniques and stocked with fingerlings of all the six species of carps cultured under composite fish culture at higher of 8000–9000/ha with surface, column, bottom feeders and grass carp in the ratio of 40:20:30:10. Marketable size fish are sold by partial harvesting while final harvesting is done only after 12 months of farming.



About 2 months-old weaned piglets are fattened for six months when they attain slaughter size (60–70 kg) and similarly a second crop is raised within the next six months. About 30–40 pigs should be kept for proper fertilization of the pond. Pigs are fed on mash at an average rate of 1 kg/day. Green grasses or animal fodder is also provided. Grass with interlocked soil in root system (sod) is provided once a week to avoid mineral deficiency. Fish yields ranging from 6000–7000 kg/ha/yr are generally obtained.

(ii) Integrated fish - duck farming

This is also an efficient integrated system based on the principle of waste recycling. Pond preparation technique is basically the same. A duck house is normally constructed on the pond embankment or on the pond water on a floating platform (Figs. 10A and 10B). When given free range, ducks feed on aquatic organisms such as insect larvae, tadpoles, mollusks, weeds, etc. The duck droppings like pig excreta act as fertilizer.



Ponds are prepared and stocked with fingerlings of all the six carp species at 6 000 ha with surface, column, bottom feeder and grass carp in the ratio of 40:20:30:10. Fingerlings of over 10 cm are preferred for stocking. About 200–400 ducks are sufficient

to adequately fertilize about l ha pond. Normally 2–3 months old ducklings are preferred. Although ducks are able to feed upon natural food from the pond, they are also provided with duck feed at the rate of 100 g/bird/day. Ducks start laying after 5–6 months and continue for 2 years. Fish yields ranging from 3000–5000 kg/ha/yr are generally obtained.

(iii) Integrated fish - poultry farming

Under this system of integration the poultry birds are raised in cages under a shed normally constructed over the pond embankments or in the vicinity of the pond. The space requirement in such a system of poultry raising is about 1 sq.ft. per bird. The droppings of the birds fall on the floor from where these are collected and applied to the pond. The chicken house can also be built directly over the pond water so that the excreta may fall in the pond water underneath.

Usually, 400–600 chickens/ha of pond water surface are used. No feed or fertilizer is applied in the pond, except aquatic vegetation for the grass carp. Fish production at the rate of 4–5 t/ha is possible using this system.

In India, this system of freshwater fish culture has assumed greater significance in view of its potential role in recycling of organic wastes and in integrated rural development.