



## Potential of fish-cum-pig farming in India for small and middle farmers

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Integrated farming is a farming in which the utilization of the synergetic effects of inter-related farm activities and the conservation, including the full utilization of farm wastes. Hence, integrated fish-cum-pig farming is the farming practice with the integration of pig and fish through utilization of farm wastes with an objective of maximizing the yield under sustainable production with reduced inputs cost. Integrated fish farming involving aquaculture defined broadly is the concurrent or sequential linkage between two or more activities, of which at least one is aquaculture.

There is no doubt of saying that; about 80 per cent of India's population lives in rural areas at subsistence or near subsistence level. These rural folk are greatly undernourished and need not only a large supplement of animal protein to their diet but also new sources of gainful employment. Fish culture could contribute substantially towards solving these crucial problems of rural folk.

The farming system acceptability is highly dependent on effective factors that are in turn influenced by the economic, social and cultural situation of the fish farmers. Till now there has been only few percentage of the population that was engaged in this system. The raising of pigs can be combined fruitfully with fish farming by constructing animal housing units on the pond embankment or over the pond in such a way that the wastes are directly drained into the pond to fulfil its organic and nutrient substance requirement for plankton production. The system has obvious numerous advantages:

The pig dung acts as excellent pond fertilizer and raises the biological productivity of the pond and consequently increases fish production. Some of the fishes feed directly on the pig excreta which contains 70 per cent digestible food for the fish. No supplementary feed is required for the fish farming, which normally accounts for 50-60 per cent of the total input cost of fish farming. The pond dikes provide space for erection of pig housing



unit for its rearing purpose. Pond water is used for cleaning the pigsties and for bathing the pigs. This system have some problem in adoption in all parts of our country due to religious consideration but it has special significance in certain areas as it can improve the socio-economic status of existing fish farmers, weaker rural communities, particularly the different tribes who

traditionally raise pigs and can adopt fish-pig farming easily.

**Farming practices:** Construction site for this system should be easily accessible, facilitate proper caring of livestock and it also discourages poaching. Construction of pig shed should be higher side of the pond near embankment to facilitate the drainage of waste feed and excreta direct into the ponds. Under this system some measurements needs to consider for higher yield as follows.

**Pond preparation:** First, it has to drain and dry the pond to remove all the weeds and unwanted fish fauna from pond. If it is not possible to drain the pond, all the fish can be removed by applying bleaching powder and urea mixture in 1.5:1 ratio at the rate of 150 kg/ha. Alternatively, at the rate of 2500kg/ha, mahua oil cake can be applied which remove all the fishes in 6-10 hours and also acts as organic pond fertilizer. Piglets are brought to the pond before stocking the fish, so no basal requirements of organic manure is required.

**Stocking:** Stocking of fingerlings is done after 15-20 days of poisoning with bleaching powder or mahua oil cake. Depending on the availability of fish seed of desired species stocking can be done of 3,4 and 6 species according to their feeding habit. Among culturable species, Silver carp and Catla is surface feeder, Rohu is column feeder, Mrigal and Common carp are bottom feeder and grass carp is column feeder and feeds on grass available in ponds or supplemented from outside. Different stocking can be adopted as per local requirement; ratio of above species



in stocking should be 30 to 35 per cent of surface feeder, 15 to 20 per cent of column feeder and 35 to 40 per cent of bottom feeder with 10 per cent of grass carp seed is recommended in six species farming system. The recommended rate of stocking is of fingerlings in ponds are 8500 fingerlings/ha.

Alterations can be made on stocking density and species ratio, depending on the local conditions. Grass carp should be fed regularly with aquatic or terrestrial vegetation. Liming of the pond is done at regular intervals. It helps in stabilization of organic matter, pH and water quality of pond. Application of lime at regular intervals at the rate of 200-250 kg/ha is recommended to keep environment of ponds healthy for fish farming.

**Harvesting:** Due to abundance of natural food in the fish-pig pond, the fish attains marketable size within 6-8 months. Partial harvesting, therefore, may be done 3-4 times in a year depending upon the growth of fish. Final harvesting may be done after 10-12 months.

**Pig raising:** Among the domestic rearing animals, pig is most economic, most prolific breeder and have maximum rate of food conversion ratio. Pig is able to convert kitchen, agriculture and industrial waste or by-product into quality animal meat at fast rate and having FCR is 3.00 to 3.5 kg feed per live weight gain.



The pigsty is constructed on the pond embankment in such a way that the waste washings of pigsty are drained to the pond through a delivery channel. A diversion channel is always provided to divert the excreta away from the ponds as the excess excreta may cause algal bloom or any other abnormality in ponds. Washings of pigsty are drained into the pond after sunrise to avoid oxygen depletion. The pigsty can be constructed from any available cheap materials but the floor must be cemented with a slope towards the pond.

**Suitable pig breeds for integrated fish farming:** Pigs available in our country can categorize into wild pig, indigenous and exotic domesticated pigs. Among the domesticated pigs, exotic breeds of pigs having faster growth rate in compare to indigenous breeds. Common exotic breeds of pigs available in our country are large and middle yorkshire, barkshire, duroc, hereford, landrace and breeds produce by crosses between exotic and indigenous pigs. Among above breeds large and middle yorkshire and their crosses are most suited and coherence to Indian conditions for integrated fish farming.

**Management:** The number of pigs requirement will depend upon the pond area. The excreta of 25 to 30 pigs are sufficient to fertilize a pond of one hectare area. For small farmers having small ponds there are three pigs may be raised on a pond of 0.1 ha area. Stock the pig pen with proper vaccinated weanling pig (8-10 kg or 1.5 months old). Each pig is provided with a floor space of 1-1.5 m<sup>2</sup>. Feeding to pigs is done twice a day with balance diet. They can be fed with kitchen vegetable waste, green fodders, grasses etc with concentrate diet. Piglets should be stocked 15-20 days prior to stocking of fish it helps proper manuring of ponds and production of planktons.

As pigs attain slaughter size within 6-7 months (60-70kg) and fishes get final harvesting in 10-12 months. Therefore, two crops of pigs can be raised along with one crop of fish.

**Issues for further considerations:** Extremely resource-poor households may find it difficult to adopt the technology, as this requires the pigs to be penned up. In small-scale rural farms, pigs are typically permitted to roam and scavenge for their feed as this avoids the investment and effort of penning, it is not acceptable as for as consumer preference. On the other hand in farming systems where pigs are penned and raised on supplement diet to produce good quality pork with faster growth rate is more adoptable and acceptable to consumers.

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