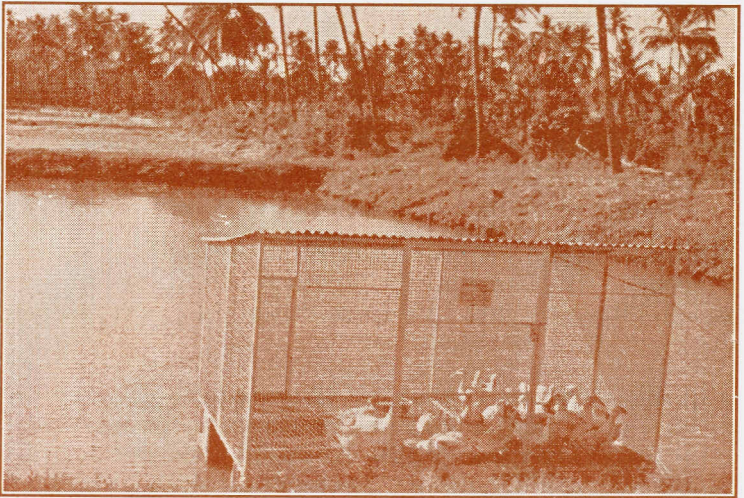


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# DUCK - FISH INTEGRATED FARMING SYSTEM FOR GOA



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## TECHNOLOGY FOR DUCK - FISH INTEGRATED FARMING SYSTEM IN GOA

Fish and meat have high demands in Goa. While marine fish and poultry meat consumption is an accepted practice in Goa, production of carps, a set of freshwater fishes in ponds and duck rearing are recent introductions to Goa. The fresh water potentials of Goa consist of many small and large ponds which are underutilised at present. There are about 100 ha of long seasonal and perennial ponds and bhandaras in Goa, in addition to many rain water impoundments adjoining paddy fields and storage tanks which are used for irrigating crops chiefly paddy and vegetables. It would be possible to culture 4 to 6 varieties of fast growing carps in combination, in these water impoundments. In addition, the shallow margins of rivers, reservoirs and old unused mine pits, could be impounded into pens with the use of bamboos and nets and these impounded areas could also be used as ponds for fresh water fish culture production.

For regular fish culture, the ponds are manured and fertilised monthly for production of fish food called 'Plankton' and in addition, feeding of fish should also be done to enhance production.

By integrating duck rearing in fish pond itself, the chief and expensive inputs like manure, fertilizers and fish feed could be avoided. This is because the droppings of the ducks fertilise the pond to produce sufficient food for the fish.

In the integrated culture of fish and duck, both the components are mutually beneficial. This combination increases the production of both fish and duck and reduces as much as 60% total input cost in fish culture by way of pond fertilizers and fish feed. The ducks also get about 30 to 50% of their food from the pond. The ducks feed on aquatic weeds, insects, molluscs etc., which do not form the food of fish.

### I. CULTURE MANAGEMENT

#### a) Pond management practices

Below mentioned scientific practices should be followed for successful culture :

1) The pond has to be prepared by strengthening the bunds, prevention of water overflow, closing the inlet and outlets by fixing screens to prevent escape of stocked fish and entry of unwanted local and carnivorous fishes.

2) If possible, the pond is dewatered and the bottom dried prior to commencement of culture. Let in the water after a few days of exposure to sun or during the onset of monsoon.

3) All the aquatic weeds and vegetations are eradicated by removal.

4) All local fishes are removed by netting and poisoning with mohua oil cake and lime.

5) About 300 to 500 kg of lime is applied per hectare of pond.

#### b) Selection of fish species and stocking

The composite fish culture combination of 4 species namely catla, rohu, mrigal and common carp, which could be simultaneously cultured in the same pond, could be selected for the duck - fish farming as well.

These carps are fast growing varieties and would grow upto one kg individual average weight in one year culture period. The four varieties namely catla, rohu, mrigal and common carp should be stocked in the ratio of 2:2:1:1 at the stocking density of about 6,000/-ha. To avoid predation by duck themselves, it is important that slightly grown up fish seeds of the size of about 100 g each should only be stocked in the pond.

#### c) Fish harvest

Harvest of fish from pond can be made either when the fish attain the marketable size of 1 kg average or after one year of culture or when the water level in the pond is reduced less than a metre. About 4,000 kg of fish can be harvested per year with the 4 species carp combination under system.

## II. DUCK HUSBANDARY PRACTICES

#### a) Duck shelter

Ducks require only a simple house or enclosure as a night shelter. On the pond embankment, a small enclosure made of split bamboo could be constructed for the night shelter where the ducks should be kept during night. Alternatively, a floating duck house can also be constructed using either angle iron or bamboo as frame, welded mesh or bamboo for floor, chicken mesh or welded mesh for sides, light flooring material or asbestos sheets for roof and empty plastic barrel or oil barrels for floats. Care should be taken so that the house is well

ventilated and the washings can be drained into the pond. A sloping trap door made of bamboo or wooden plank may be used for letting out the ducks into the pond during day time and taking in the birds during evening. The advantage of a floating duck house is that the duck droppings will fall directly into the pond even during night and the house can be moved to keep at different points in the pond.

#### b) Selection of ducks

Ducks can be reared in this combination either for egg or for meat. There are three breeds of ducks which could be used under Goa conditions: They are 'Khaki Campbell', Indian Runner, 'White Pekin'. While Khaki Campbell and Indian runner are good egg layers, the other is a meat type duck. However, the latter two are hardy and suitable for rearing in combination with fish. Therefore, the farmer could select his breed depending upon his choice and on the availability of stock namely the ducklings. However, layer type will be more suitable as they can be reared in combination after brooder stage and for broiler brooder arrangement in the cage is a must which may not be practicable.

#### c) How to rear ducks in ponds

It was found that about 200 to 250 ducks are sufficient to produce the required manure for 1 ha pond. The space required for night shelter, either on the pond bank or in the floating duck house, is about 0.5m<sup>2</sup> of floor space per bird. This is, about 70 to 100 m<sup>2</sup> area is needed as night shelter to accommodate 200 to 250 birds which would cater the need of one hectare pond.

Three to four month old ducklings are ideal for starting the rearing in ponds. Ducklings should be given necessary prophylactic vaccinations before taking up for rearing. Two batches of six months each may be reared in this system if meat type ducks are selected. For egg production the same set of birds could be continued for one year or more. The bird attains about 2 kg weight in a year.

#### d) Feeding

Ducks may be allowed to forage in the pond during the day time. However, this alone may not be sufficient. To supplement, about 100 g of feed consisting of standard poultry mash and rice bran, may be provided as wet mash for each bird daily in the night shelter. The spillover feed will be consumed by the fish in the pond. Sufficient water should be provided in a trough

deep enough to submerge the bills of ducks. For ducks, do not provide feed without water. Care should be taken to avoid mouldy feeds for fear of aflatoxin contamination. Wet feed should not be left out and carried for the next day.

#### d) Egg Laying

After about 6 months, ducks start laying eggs. Ducks lay eggs during night and early morning. Therefore, a straw bed should be provided in a corner of the night shelter to avoid damage or loss of eggs. A healthy adult duck may lay about 200 to 300 eggs per year.

#### f) Duck droppings as manure

Ducks, while foraging during day time, distribute their droppings throughout the pond. They also disturb the pond bottom enhancing the pond productivity. Dropping laid in the night shelter should also be washed into the pond. One duck voids about 150g droppings per day. With 200 to 250 ducks/ha about 10,000 to 12,000 kg of droppings are recycled in one hectare pond every year. This is sufficient to produce enough fish food organisms in the pond.

### III. ECONOMICS (for 0.2 ha pond)

#### A) Non-recurring expenditure

Night shelter	Rs. 5,000-00
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#### B) Recurring expenditure

1) Cost of 6 week old ducklings for 60 ducklings @ Rs. 30/- per bird.	Rs. 1,800-00
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2) Cost of feed for 300 days i.e. 24 bags of feed @ Rs. 630/- per bag of 70 kg.	Rs. 15,100-00
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3) Fish seed (600) including transport	Rs. 1,200-00
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4) Labour @ Rs. 40/- for 45 man days & miscellaneous	Rs. 1,900-00
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5) 20% of the capital expenditure for night shelter maintenance	Rs. 1,000-00
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<b>Rs. 26,000-00</b>
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#### C) Receipts

1) From sale of fish (800 kg) @ Rs. 40/- per kg.	Rs. 32,000-00
2) From sale of 12,000 eggs @ Re. 1.00/- per egg	Rs. 12,000-00
3) Sale of meat (120 kg @ Rs. 40/- per kg)	Rs. 4,800-00
	<b>Rs. 48,800-00</b>

D) <b>Income</b> : Receipts	Rs. 48,800-00
Expenditure	Rs. 26,000-00
<b>Net Profit ...</b>	<b>Rs. 22,800-00</b>

### IV. SALIENT FEATURES

The duck-fish culture is one of the most economic integrated farming systems, which has the following salient features.

- 1) Fish utilize the spilled over duck feed and their droppings which save the need for pond fertilization and fish feeding.
- 2) Ducks keep aquatic plants in check.
- 4) The cost on duck feeding is partially reduced as ducks forage in the pond.
- 5) Ducks loosen the pond bottom which increases the pond productivity.
- 6) Ducks uniformly distribute their droppings throughout the pond which is in effect labour saving device.
- 7) No additional space is required for duck rearing.
- 8) Fish, eggs and meat are produced in a single unit area and it ensures higher profit with fewer inputs.

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