Duck weed based fish farming in pond

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About duck weed: It is a smaller floating plant used as nutrient rich feed by the animals and herbivore fishes. The soil, water and climate favors well for the growth and production of duck weed and it is available almost all the geographic locations of the country. Naturally it grows ponds, ditches, canals etc. There are six species of duck weeds in our country and among them, three species namely *Spirodela polyrriza* (Sonapana), *Lemna minor* (Khudipana) and *Wolffia arrhiza* (Sujipana) are culturable. Duck weed based fish farming has gained popularity due to increase in fish production through low cost protein rich feed application.

Pond selection: Any type of water body can be used for duck weed production towards commercial fish production. However, unutilized or less utilized or unproductive waterbodies (derelict ponds/ditches/road side canals etc.) can be selected for duck weed based fish farming. ponds or canals having with high level of organic matter content are more suitable for the production of duck weed. Some other important considerations are: round the year water availability of the pond; good water holding capacity of the pond soil; pond having partial or maximum shading facilities; good facility for water drainage; and easy availability of the aquaculture inputs closer to the pond.

Pre-stocking pond management: emphasis should be given on pond remodeling (in terms of inlet and outlet facilities and repair of the embankments) to protect from flood water entrance or to drain the excess water (in case of emergency); staffing with grass on the embankment so as to protect soil erosion (specially in red soil area); deweeding; and removal of predatory and unwanted fishes/animals.

After 3 days of predatory fish removal, liming should be done to remove clay turbidity and to disinfect the pond water (CaO@1 kg/decimal) for normal soil. Ash treatment (ash @15-30 kg/decimal) including liming (CaO@ 2-3 kg/decimal) is required for red soil. After seven days of liming, fertilization (organic fertilizer/compost @10kg/decimal, urea @ 200g/decimal, TSP @ 200g/decimal and MP@ 200g/decimal) should be done to produce plankton in pond water; after

five days of fertilization, a separate production unit should be developed to supply sufficient amount of duck weed in the pond.

Development of duck weed production unit: Around 75% of the pond is separated by bamboo fencing to produce the duck weed. Duck weed seeds are inoculated (sonapana @ 25 kg/decimal, sujipana @25 kg/decimal and khudipana @ 16-17 kg/decimal over the production unit. According to research report, per decimal 2.5-3.0 kg of khudipana, 4.5-5.5 kg of sonapana and 5.0-5.5 kg of sujipana can be harvested through regular fertilization. On an average, per decimal 3.0 kg of duck weed can be harvested per day through regular fertilization.

Fish stocking: After 5-7 days, stocking (Fish size between 3 and 5 inches) should be done subjected to the sufficient production of duck weed.

Fish species	**Stocking density (Number/decimal)**	
	Model-1	**Model-2**
Catla *(Catla catla)*	06	08
Silver carp *(Hypophthalmichthys molitrix)*	08	06
Rui *(Labeo rohita)*	04	04
Grass carp *(Ctenopharyngodon idella)*	03	03
Raj punti/Sarpunti *(Barbodes gonionotus)*	10	10
Kalibaus *(Labeo calbasu)*	-	06
Mrigel *(Cirrhinus mrigala)*	06	-
Carpio *(Cyprinuscarpio var. communis)*	03	03
Total	40	40

Post stocking pond management: Liming can be done periodically (CaO@100-250g/fortnight decimal for normal soil). In addition to lime application, ash treatment (ash@5-10 kg/decimal/fortnight) is required for red soil. Application of organic fertilizer (cowdung/compost @800-1000g/decimal/day) and inorganic fertilizers (urea @25-35 g/decimal/day, TSP@8-10g/decimal/day and MP@)6-8g/decimal/day) are required for smooth supply of duck weed round the year. The mixture of fertilizers with water (fertilizer: water @ 1: 7) should be kept for 24 hours mixture solution should be spread over the duck weed free water area of the pond. The amount of

duck weed produced per day in the pond should be maintained similar amount of the stocked seeds. Duck weed as feed should be supplied @ 100% of fish body weight. After consumption by the fishes, surplus amount of duck weed can be harvested for supply to another pond. Change (increase or decrease) in the number of stocked fishes can be done for proper utilization of the duck weed produced in the pond. Usually there is no necessity of supplementary feed application during availability of sufficient amount of duck weed in the pond. During unavailability of duck weed, supplementary feed (rice bran-50% and mustard oil cake-50%) can be given @3-5% of fish body weight. Other weeds like azolla, banana leaf, vegetables and soft grasses can also be supplied as fish feed instead of duck weeds. Improved yield can be achieved if both weeds (30-50% of fish body weight) and supplementary feeds (2-3% of fish body weight) are provided with the fishes. However, it is better to reduce the use of supplementary feed and to increase the efforts for duck weed production and consumption for the fishes.

Fish harvesting: The SIS fishes can be harvested after 3-4 months of stocking, on the other hand, larger size carps (500 g and above) can partially be harvested and replaced by restocking.

Precaution: Clear water (i.e. water having no nutrients through fertilization) can affect the duck weed production.