M. Sc. IV Sem.

Paper Elective Paper III

Fishery Science, Culture Fishery

Composite Fish Culture or Polyculture

From ancient times man has utilized the ponds and kept fishes for their interest. Afterwards they started to use the fishes for food and ornamental purposes. It was a problem before them as how the increase the fishes in number and maintain them in the ponds. Previously nothing was known about the environmental and physiological conditions of fishes hence the process of fish culture was unsuccessful. Thus, the scientists in their concern to know more about the fishes started to study the morphology, physiology, histology, reproduction, habit and habitat of the fishes. These findings proved to be significant and encouraged them to think about the fish culture at commercial and broad level. In India, first of all the fish culture was started in the West Bengal.

Types of fish culture

Fish culture practices can be of the following three categories-

Extensive Fish Culture: Mostly ponds are of large size but no scientific methods are used for increasing the fish production. The fish production totally depends on the natural food (especially planktons) presented in the pond. The artificial food or supplementary food and fertilizers are not used. Hence, the total fish production is low.

Intensive Fish culture: The ponds may be of small size but the total productions of fishes are very high. The natural food is increased in pond by using fertilisers and manure and fish are fed on artificial food also with 3-4% body weight of the fish. The pond is extremely managed scientifically and efficiently. The mortality of fry and fingerlings is very low in this type of culture. The suitable combination of fish species is used to obtain maximum production.

Semi Intensive Fish Culture: This is a transitional stage between extensive and intensive fish culture and full potential of the ponds are not utilised.

Methods of fish culture

Depending upon the special method used, fish culture can be of the following types-

Mono-culture: In this method, only one species of fish is culture in a pond.

Composite Fish Culture or Polyculture: In this method usually three species or four species or six compatible or friendly species of fish are cultured simultaneously in a pond, so that all available resources of food are utilised. There is no competition between the species and the production is very high.

Type of ponds or Nature of Ponds

Three types of ponds are used for the fish culture-

Nursery Pond

The nursery ponds are small in size with 0.1 to 0.2 hectare and depth 1.5 to 2.0 meter. The nursery pond should be free from toxicant, large size insects and aquatic weeds. It is use for the caring or culture of fries (seed of fish) up to 3.0 cm.

Rearing Pond

The size of rearing ponds is 0.2 to 0.3 hectare and depth 1.5 to 2.0 meter. The rearing pond should be free from toxicant and predators as like snake, catfishes, carnivorous fishes, large size insects and aquatic weeds. As fingerlings attain a length of about 20 cm or 10 gm, they should be transferred to the other type of pond called as stocking pond.

Stocking pond

The size of ideal stocking pond is 0.8 to 1.0 hectare and depth 2.0 to 2.5 meter. The stocking ponds should be well cleaned of aquatic weeds and predatory fishes. The sufficient quantity of food (Natural and artificial) is essential for healthy growth of fishes and high production of fishes.

Feature of Ideal pond

The achieve of high production of fishes, the many important features of a pond are essential such as-

Size	0.8 to 1.0 hectare
Soil	Clay loam, Sandy loam
Pond depth	2.0 to 2.5 meter
Water depth	1.5 to 2.0 meter
Direction	East to West (for proper natural aeration)
Embankment or dyke bearth	1.5 to 2.0 meter
Bund slope	1:2 or 1:3

Manuring and fertilization

The manure and fertilizers are most important for healthy production. The amount of fertilizers used in a pond totally dependent on the fertility of the soil and quantity of the plankton.

Urea	50kg/ha/year

Single super phosphate	100kg/ha/year
Cowdung	10 tonnes/ha/year
Lime	200kg/ha/year

Stocking density of fishes

Fingerlings should be stocked in the rate of 10000 to 12000/ha/year.

Species (Zoological name and common name)	**3 species**	**4 species**	**5 species**
Catla catla (Bhakur or Catla)	4000	4000	2000
Labeo rohita (Rohu)	4000	4000	2500
Cirrhinus mrigala (Nain or Mrigal)	4000	2000	2000
Hypophthalmichthys molitrix (Silver carp)			2000
Ctenopharyngodon idella (Grass carp)			1500
Cyprinus carpio (Common carp or China Rohu)		2000	2000
Total	**12000**	**12000**	**12000**

Artificial feeding

The farmers in most regions of the world relies farm made feed rather than commercial feed. The artificial food should be provided in the rate of 3% body weight of fishes. The rice polish, rice brawn, broken rice, oil cakes (as like coconut, mustard, groundnut, soybean), wheat flour and 2% salt are common ingredients used as artificial food for the fishes. The best time for feeding of fishes is in the morning hours. The quality of food should not be changed suddenly.

Harvesting

The harvesting is done to capture the fishes from the water. The well grown (about 1 to 2 kg body weight) fishes are taken out for marketing and self consumption. In highly organised and well planned fish farming, the fishes below 1 kg are not generally capture. The fishes are capture from the pond with the help of drag net and cast net. The gill net is not used in the culture pond for harvesting.

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