Some facts for the grow-out culture of an endangered catfish, *Clarias magur*

S.K. Sahoo, S. Ferosekhan and S.S. Giri

Central Institute of Freshwater Aquaculture, Kausalyaganga, Bhubaneswar - 751 002, Orissa, India

A haul of C. magur fingerlings suitable for grow-out culture.

India is well established as a leading aquaculture producing country in Asia, with production weighted towards the Indian major carps. The diversification of species and culture systems is instrumental in providing consumers with a wide choice of fish. Research on the aquaculture of minor carps, medium carps, catfishes and air-breathing fishes has opened the opportunity for larger adaptation and culture of a wide range of fish species by farmers. Some varieties of carp and catfish have low growth potential, but their marketing scope is sufficient to make them economically attractive.

Clarias magur is one such catfish, which has immense demand among consumers. Usually demand is satisfied by a combination of wild caught and cultured fish. However, a drastic reduction in wild populations has led to this species being listed as endangered by the International Union for Conservation of Nature (IUCN). Only a limited level of its production from pond culture is available, due to lack of technical back up. But success in culturing this fish has been registered after overcoming various technical problems involved during its production. The article communicates the aquaculture practice of this catfish in captivity.

Characters in favour of *C. magur* as a farmed species:

- It has high market demand and food value.
- It adapts well to a variety of freshwater conditions and can survive in conditions of low dissolved oxygen, as it has an accessary respiratory organ.
- It readily matures in captivity.

Procurement of seed

It is not easy to get sufficient stocking material from nature to start aquaculture of any species. Hence hatchery production of seed is necessary to get a reliable supply of the desired number and size of stocking material. This catfish can be

raised in earthen ponds or cement cisterns by feeding compound feed containing 30% protein to get a suitable size of 100-150 g for induced breeding operations. Suitable females can be identified by observing the bulging abdomen whereas males can be identified from their pointed genital papila during the spawning season (July-August).

Induction

Females needs to be injected with Ovaprim @ 1-1.5 ml/kg body weight and are ready for stripping after 17 h post-injection. The incubated eggs hatch after 25-26 hours, depending on temperature. The hatchlings do not accept any feed until their yolk sac is fully absorbed on the third day of life. Mixed zooplankton serves as the best food for the larvae and fed to larvae from fourth day of hatching. They need good water and aeration during their rearing. The larvae thus reared are harvested after two weeks period. They are transferred to cement nursery and reared with compound feed for 2-3 months to produce fingerlings. These fingerlings are ready for stocking in the ponds to get marketable fish.

Pre-stocking management

Pond size and environment

Either earthen pond or cement cisterns are suitable for its grow out culture of this catfish. The pond sizes usually vary depending on seed availability. As this fish does not perform well at high density during its culture, it is better to opt for a medium size pond of not less than 0.04 ha. Cement cisterns can also be used to raise marketable fish, but the fish grow less efficiently compared to pond condition. Hence the possibility of lower production as well as longer culture period cannot be avoided during its culture in cement cisterns.

Water quality parameters should be with such as pH 6-8, alkalinity >20 ppm, dissolved oxygen > 5 ppm and ammonia < 0.05 ppm for optimum growth and survival.

Pond preparation

Pond preparation is essential to provide optimal conditions to fish for higher growth, survival and yield. Hence perennial ponds must be weed free and dewatered to ensure a predator free environment. Seasonal or dewatered ponds should be manured like a carp nursery to promote natural food production in the pond system. Even though the culture is feed based, these fish efficiently utilise natural foods to supplement their growth and survival in many occasions.

Size of seed

The size of seed plays an important role in growth and yield during the culture period. The possibility of lower growth and survival cannot be ignored if smaller seed are stocked. Hence it is always advisable to stock seed at about 10 g in culture ponds to avoid early mortality and lower growth.

Red patch found on the body of C. magur during its culture.

Stocking of seed

Fingerlings are usually brought from own farm or outside, while stocking for the production of marketable fish. It is essential to ensure that the seed are healthy and free from stress. It is often found that the seed accumulates stress during transportation. Hence the seeds need to be acclimatised in the pond environment for quite a long period to get rid from stress before their release, as this catfish accumulates stress easily. It is advised to undertake water exchange as well as aeration during transportation. A lot of mortality is usually found if they are released immediately after long transportation. It is always beneficial to undertake transport and stocking of seed during the early hours of the day to reduce stress and curtail mortality.

The production of a pond depends on the growth as well as on the number of fish stocked. The growing period is also another important factor for a fish farmer. As this catfish grows slowly, it is always recommended to stock at a lower density like 40,000-50,000/ha. It is always advisable to adopt monoculture of this fish due to its slow feeding behavior.

Post stocking management

Feeding

Even though the fish utilises the limited natural food from the pond, it is essential to supply compound feed, where fish meal becomes a more essential ingredient. Feed containing 30-32% protein is sufficient enough to provide optimum energy for the somatic growth during the culture period. This fish accepts sinking feed of 1-2 mm size. The feed should be provided in feeding tray to minimise the feed loss as well as to reduce feed wastage during winter months by observing consumption patterns.

Environment management

The culture environment deteriorates due to accumulation of metabolites and unutilised feed material as it is a feed based activity. Mostly water parameters like dissolved oxygen or pH are affected seriously, apart from ammonia accumulation during the culture activity. This is more commonly seen in cement cisterns while undertaking growout activity compared to pond conditions. Hence it is essential for intermittent water exchange to give optimum environment for their growth and to avoid fish loss.

Health management

Incidence of disease is often found during winter season or just during the shifting of winter to summer. Diseases like fin rot, ulcers and red patches near the tail or body are found. These can be controlled by frequent water exchange at the beginning of incidence. It is better to segregate the affected fishes, which will restrict further spread of disease. Usually before the incidence, affected fish show slow swimming and low acceptance to feed. Hence it is inevitable to take care of environmental management to restrict the incidence of disease.

Harvest

Culturing at low stocking density gives better fish size compared to high stocking density even though the yield per hectare is lower. Fish of 100-150 g have immense preference among the consumers. The growth and yield pattern of this fish have been evaluated at different densities, which indicated that up to 40,000-50,000/ha are sufficient to produce marketable fish within a year, with a production range of 1.5-2.0 t/ha. The yield can be enhanced at higher density, but with smaller fish. In this situation, the culture period can be increased to harvest bigger fish. But farmers prefer to increase their profit and reduce risk by reducing the culture period.

The time of stocking may be another management aspect to get better growth or yield in this fish. The required size of fingerlings is only available during just prior to winter season. So the growth of fish is hampered during the cold period and the growth accelerates only when the water temperature reaches 27-28°C. Hence the stocking time of the fish should be adjusted so that they get a longer growing period during warmer conditions to reduce the overall culture period or to get higher growth and yield.