

The practice of carp hatchery technology around Laguna de Bay

By **NJ Dagoon**

Bighead carp (*Aristichthys nobilis*) was introduced in the Philippines by Chinese experts commissioned by the Philippine Fisheries Commission (NIFRC, undated). In 1966-67, culture trials were successful and in 1968, importation began to launch the Philippines' Freedom from Hunger campaign involving carp farming and polyculture of freshwater fishes.

The bighead carp, as its name suggests, has a big head and a short and blunt snout. On its dorsal and upper portions, yellowish black blotches are scattered. The carp is a zooplankton feeder and spends its life in freshwaters. It naturally spawns in river mouths. In its native habitat, subtropical and temperate China, the carp breeds only once a year. However, in tropical conditions, this carp species has been proven to mature and remature several times annually.

The agency responsible for demonstrating the feat is SEAFDEC's Binangonan Freshwater Station (BFS) in the Philippines. Since 1981, BFS has continued to develop other technologies beneficial to the artificial propagation of bighead carp in the tropics. These research milestones include: induced spawning and fry production in 1983; completion of the bighead carp lifecycle in 1986; formulation of an effective broodstock diet in 1987; and refinement of induced spawning techniques in 1988.

Located in Tapao Point in Rizal Province, BFS overlooks Southeast Asia's largest freshwater body, Laguna de Bay. At 900 km² in surface area and with a mean water volume of 3.2 x 10⁹ m³, the lake plays host to a great number of economic uses: fishfarming, cooling water, open water fishing, irrigation and barging, as well as industrial water supply (Charlton 1993). The most important use of the Lake has been as fishery resource (Barrill 1993). About 76,000 families, reports Barrill are depend-

ent on the Lake for livelihood through community and open fishing. Owing to the SEAFDEC presence, a good portion of them are into bighead carp business: growout culture and broodstock-hatchery maintenance.

Barangay Kalinawan is an illustration of how extensive carp culture has been in the area. Seeming but a stone's throw away from the SEAFDEC station, it claims to be 90% sold on or devoted to bighead carp culture. Gleaning from some testimonies, it may be said that the villagers attribute their economic success to the venture.

Visits to two big hatchery sites in Kalinawan have yielded interesting information on bighead carp culture practices of private industry in the Lake.

The first visit was at Normelito Cerda's hatchery facility. Normelito's brother Vergio co-owns the hatchery and acts as its caretaker/technician. The Cerdas have about 4 ha for grow-out culture and broodstock in the lake. Beginning in 1988, their business expanded in 1995 to include a P240,000 hatchery facility. After several years, the Cerdas have regained their capital and are earning some more.

Production runs for their hatchery average about two times a month, depending on weather conditions. Starting with breeders having a total weight of around 7 kg, the hatchery now has an average (low-scale) production of 200,000 fry from a hatching rate of 40%. During summer months, especially around March, this peaks at 70%.

When hatched, the fry stay for a week in hatching jars and are fed at least once a day with mashed egg yolk before transfer to a rented pond (1/4 ha) in Halayhay, Pililla, Rizal, where these await buyers. Fry demand is so strong these days that the fry are almost always disposed.

The Cerdas' gross earnings are pegged at about P60,000 from sales of fry at 12-15

centavos each. Deducting expenses, a net profit of about P20,000 is realized, which is divided into four shares.

Though not having undergone formal training on bighead carp spawning with SEAFDEC, Vergio Cerda claimed that the research agency started everything in the Lake (including tilapia culture) and has done much for present-day economic activities in the area. He added that he got his learning from self-study done while helping others start their own inland hatcheries. He also caught up on the skill through acquaintances and close kin who were SEAFDEC staff and who informally passed on the expertise. He claimed that he himself does not follow the SEAFDEC technique a hundred percent, but has modified some steps along the way according to expediency.

According to him, a successful carp hatchery owes much to training or study on how to breed carp, equipment, a good site, and hardwater conditions. Hatchery facilities must include an electric motor-run water pump, spawning tank (his has a capacity of 4,000 liters) and hatching jars (he owns around 12, each having a capacity of 120 l). Before stocking with newly fertilized eggs, it is important, he noted, that the jars should be cleaned with soap and water, with chlorine added, to minimize the occurrence of disease.

In the community, he said, there is also the practice of renting out breeders. The done deal is when 20% of hatched fry is given to the broodstock owner for hired service.

The Cerdas have a steady "suki" (habitual customers) market for their grow-out produce also: they usually sell at P30-35 a kilo. Market prices in Manila, according to Vergio, vary from P60-70.

Vergio Cerda reiterated the problem of bad weather conditions several times in the interview. A change in weather can some-



A view of Kalinawan with the Cerdas' carp hatchery facility on left

Selecting mature carp from the Cerdas' two-hectare broodstock coop in the Lake



times abort operations, as stocks die or escape from the pens. Affected farmers often have to build again. To replenish their broodstock, they sometimes resort to capturing "escapees" from open waters.

The hatchery caretaker left us with these parting words: "Industry, perseverance and good dealings with people are the secrets to our success."

The second visit was at the Aquafresh Bighead Carp Hatchery co-owned and managed by Mr. Raul Aralar. Raul shares ownership with his brother Emil, a sister and his mother.

Established in 1995 with a capital of P700,000, the hatchery is reputed to be the biggest of four in Kalinawan. It does three runs a month. Each run composed of about 7 large breeders produce an average of two million fry, with hatching rate reported at 80%. In about two weeks, all larvae are sold, at about 15 centavos apiece. Of the hatchery's gross earnings per run, around 30% is the total deductible expense.

Buyers who most of the time pick up their fry (packed at about 11,000 per bag) report a mortality rate of about 10%. Buyers come from around Laguna Lake and even as far as General Santos City.

When asked how good the profit was, he said it is very good these days. But the boom in the carp hatchery business only

started this year, he claimed. Perhaps because carp was not popular before. Now, some *bangus* breeders are now shifting to grouper. Bighead carp, according to him, has become more popular than tilapia within the Laguna de Bay area. He himself practices carp-tilapia polyculture in a one hectare cage. Currently, he has 5,000 bigheads, while stocking tilapia at 25 per m².

He cited the following advantages of carp over other fish: fast growth (in eight months, it can reach 2.5 kg); being a no-fuss feeder (may not require any feeding at all as most of its life is spent in the lake foraging for natural food); and acceptance by people.

For first-time carp aquaculturists interested in hatchery operations, Aralar recommended the following practices. Look for good staff who know about the fish and can be trusted around them. The hatchery should be situated in a good site—e.g. near the Lake so that stripped fish can be easily brought back to their pens to recover. Feed



Mr. Raul Aralar, full-time manager and co-owner of Aquafresh Bighead Carp Hatchery at Binangonan, Rizal

fish with supplementary food pellets when feasible; feed the newly hatched larvae with mashed egg yolk, *Artemia* and *Moina*. Make it a family business so that everyone cares or sacrifices for it. He estimated that 300 broodstock would allow a hatchery to break-even in its first year.

He added that it was his brother Emil who taught him carp hatchery technology. Since then, he has improved on the method. An example of a significant modification

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too many might saturate the market for grow-out.

The BFAR Center produces only around 20,000 to 50,000 fingerlings per production schedule. It sells these one-month-old hatchlings at a price much lower than the private sector does (P1 thereabouts), for 30 cents apiece. Spawning runs are done at the Center 5 to 6 times a year.

Existing market conditions suggest not much demand for common carp in Manila. In Lucban, Quezon and the Bicol region, however, carp prices range from P90 to P120 a kg.

Bighead carp is usually sold disguised as a marine fish (e.g., maya-maya) in big city markets. Its sections are priced differently: the head region, P45-50; head to belly, P70 and the tail portion, P45.

The Center does acknowledge the need to promote the acceptability of carp as a foodfish, in markets dominated by marine fish produce. This goal may be realized with NIFTC's proposal to integrate value-added carp-based production development in collaboration with the postharvest technology division of BFAR. Carp is very good for surimi products, Ms. Palma noted.

Carp is 12% of the national freshwater fish production as reported by the Bureau of Agricultural Statistics (BAS), the NIFTC Chief noted. But this figure could be misleading, she said. "Twenty per cent would be nearer the actual production." She added that the discrepancy must be because different areas have different local names for carp—bighead, Imelda and mamalig are carps. She has asked BAS to review its recorded data and reconcile its statistics with current production.

Carp fisheries development that NIFTC looks forward to in the future is land-based: polyculture and integrated farming. The first-ever NIFTC nationally conducted training on carp-based integrated farming is slated this October. "The integrated approach would be a very sound

development," she said, noting that it is the Center's next step after carp hatchery and culture technology transfer; and that it meets the government's goals of food sufficiency and sustainable aquaculture development.

When asked for her concluding remarks, Chief Palma said: "Considering the low production of carp and high production turn-out for culture, and if we're trying to develop an alternative species geared towards attaining food sufficiency at the same time preserving the environment, I think we can always look up to carp as an alternative species—*Carpa para sa Masa*, Carp for the Masses." ###

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What kind of carp culture developments would you like to see in the future?

Engr. Aralar: Increase in the survival rate of larvae. It is very low right now. We consider 60% already very high. Hatching rate depends on water quality management, it varies from about 60 to 80%.

Dr. Santiago: I'd like to see people work/further developments on the broodstocks' consistent reproductive performance.

What direction will the future take?

Dr. Santiago: Broodstock development rather than hatchery operations.

Has carp hatchery technology reached its fullest potential?

Dr. Santiago: There's still much room for growth, especially in landlocked areas—those areas which cannot be supplied by marine fish, like some areas in Mindanao.

Any parting words for our readers?

Dr. Santiago: I would just like to reiterate that if you go into carp culture, you will be supporting the country's food security program. I'd like to assure you that there is money in carp culture.

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he has done, is finding out what causes some fish ailments—gas bubbles, deformities—and eliminating these. The methods are his trade secrets.

He does not plan to expand into value-added products in the future yet. What he envisioned is the acquisition and setting up of a 20-ha fish pen for broodstock and grow-out operations. Currently, he has a 50% share of a grow-out pond in Sta. Maria, Laguna. He sells his grow-out produce at P25 per kg. These are marketed at the Binangonan and Malabon markets, where he said, "kahit ilang tonelada, ubos lahat" (even tons and tons of fish will all be sold out).

Aralar plans to increase their family's current stock of 1,000 broodstock. That is by purchasing breeders whose prices range from as low as P300 to P800. By doubling the capacity of his hatching jars to accommodate 7 million fry per run, he believes he can fill in the current 30% deficit in fry supply.

Living conditions is his barangay which he estimates has around 2,000-3,000 families have improved; and this prosperity he attributes to carp.

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