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Growing catfish in the Philippines

By **MB Surtida** and **RY Buendia**

Catfish (*Clarias macrocephalus*) is indigenous in Philippine waters, thus, Filipinos are familiar with it as a food fish and a lot consider its taste as excellent. But as with most indigenous food species that are constantly extracted, our native Philippine catfish, locally called *native* or *hitong tagalog* can no longer be found in abundance.

Today, the imported African catfish (*C. gariepinus*) is more abundant. Filipinos have readily accepted it perhaps because of their familiarity with the native catfish. Most catfish eaters say that the two species taste the same and dealers pass the African catfish as *native* to encourage hesitant buyers. Few people know that our native catfish do not grow as large as the African and that catfish in the markets are seldom *native* as these are not grown in commercial quantity. Production of the African catfish, however, is low and its market remains undeveloped. This article describes the catfish industry in the Philippines and will refer to the African catfish *C. gariepinus* unless otherwise stated.

Small catfish farms

Most small catfish farms measure less than 1000 m². Production does not exceed 500 kg per week. The farms in the province of Iloilo, west central Philippines are usually integrated with vegetables and are not the main source of income.

Charlie Guardapes is the technician of an integrated farm within a residential subdivision. The farm area is 1,700 m², and is planted to several kinds of high value vegetables. There are two catfish ponds 18 m² each.

Charlie stocks 100 fingerlings and harvests every 2-3 months. His last catfish harvest was 25 kg sold at P80 per kg. He grows lettuce, green onions, ampalaya, pepper leaves, and pechay. He also grows swamp cabbage (kangkong) in his tilapia



ponds. For his vegetable plots, he uses tilapia pond water. He swears to an improved harvest compared to when he still wasn't using tilapia water. His earnings from his integrated farm allows him to support his family of five. Incidentally, this small integrated farm serves as a model farm of the Iloilo provincial government to promote sustainable farming and maximization of land use.

Arsenio "Nonoy" Suoribio has two



The Guardapes catfish ponds are ensconced in high value vegetable plots in a 1,700 m² residential area. Both commodities give sufficient income to support a family of five

250 m², two 135 m² and one 50 m² ponds stocked with catfish in Sta. Barbara, Iloilo. His ponds lie side by side and are equipped with an underground drainage. He harvests 500 kg per week from two ponds. His water supply comes from a deep well, and he changes pond water weekly. He stocks at 15 fish per m². Feeding is done twice daily at 3% body mass with a commercial feed. But he uses swine pellets instead of aquaculture feed because "it is cheaper." A 25 kg bag of pellets for fish costs P500 while that for swine is also P500 but contains 50 kg, and his catfish devour the swine pellets as they would the fish pellets.

Nonoy harvests his stock (partial) after 75 days, selling 150-200 g fish. Depending on customer preference, he harvests bigger sizes (200-250 g). His retail price (he sells to neighboring homes on his motorcycle) is P80 per kg and wholesale at P50 per kg. During peak months, orders exceed his production but he buys from nearby ponds to fill in orders. He makes sure though that the catfish that he buys is of the same quality as his.

Source of fingerlings is not a problem as hatcheries from other towns can now supply his needs. His customers repeatedly order from him because he claims, "they

RIGHT *The Locara brothers plant kangkong (swamp cabbage) in their catfish ponds to avoid frequent water change as the planted kangkong act as biofilter.*

BELOW *In the province of Bulacan, large catfish farms can produce 2 tons per week and supply 70% of the Philippine catfish market*



like the aroma and taste of my catfish." Sometimes, people complain of foul smell in catfish meat. But not his catfish, Nonoy says, perhaps because his culture water is clean and he doesn't feed with chicken entrails and raw golden snail meat as others in the area do.

The Locara Farm (owned by brothers Joemarie and Larry) in Dingle, Iloilo has two 230 m² catfish ponds with pond dikes planted to different vegetables. His water source is a 1-m deep well, and water change is done weekly. He stocks 5-7 fingerlings per m². When the fingerlings are small, he feeds them commercial feed at 1% body mass per day. As the fish become bigger, he feeds them with golden snail meat (kuhol). Larry says that he also plants swamp cabbage in his catfish ponds as he thinks they act as biofilter. He also adds a few tilapia to the catfish stock. He says that without the swamp cabbage and tilapia, he would have to change his pond water more frequently. After 3 months or when his catfish reach 200 g, he sells them at P65 per kg. His buyers are usually from neighboring towns and barangays.

Larry says that catfish is easy to grow because they can eat unprocessed feed [with his foot, he crushes the snail (kuhol) and

broadcasts the meat in the pond], not easily affected by diseases, and pond preparation is not complicated. In pond preparation, he only gets rid of predators while the catfish are small, and when these get bigger, they are almost left alone to fend for themselves except for the daily feeding ritual. But even then, if one forgets to feed twice for one or two days, the fish are not affected. They would still sell at the usual price.

The big farms

The Augru Integrated Farm in Bilidan, New Lucena, Iloilo is operated by Rufino Suelo. He started raising catfish in 1996 in a 2,000 m² and eight 350 m² ponds. Production capacity of all his ponds is 1 ton a week. He stocks at 10 fish per m² and changes water weekly. He buys fingerlings from known dealers at P2 per piece. With the catfish, he raises chicken broilers for a company on a contract farming arrangement. From his chicken farm which lies beside two of his ponds, he gets chicken entrails which he processes to feed his catfish. He says he has his own pelletizing machine and processes his own feed. He also buys trash fish for feed when it is available. His production capacity is 1 ton a week and adds that Iloilo's market demand for catfish is 5 tons a week.

"There is room for many more catfish producers. Catfish used to sell very well but with more people going into catfish pro-

duction, prices have dipped," he says. He has not fully stocked his ponds because he says that profit would be affected by the low market price. Another problem is the continuous erosion of his dikes because he says that catfish burrow in the dike bottom, rendering it soft. The top portion of the dike slowly collapses. But he is hesitant to cement his ponds because when catfish burrow, he says, they hit the cemented wall and hurt their mouth. They are then unable to eat.

According to Rolando Ramos, owner of a commercial catfish farm in Pandi, Bulacan, Bulacan is the biggest catfish producing province in Northern Luzon (other towns are Calumpit and Bustos). In Pandi, 25% of farmers culture catfish and their market reach Ilocos, Isabela, Pangasinan, Tarlac, and Pampanga, all provinces in north Luzon. Bulk orders usually come from Pampanga province at 2 tons in one night. One hundred individual farms operate in Pandi. His hatchery-produced fry are transported as far as the Bicol region.

Skewered broiled catfish are ubiquitously sold along the highway through the provinces of Pangasinan, Pampanga, and Bulacan. Thus, most people believe that these provinces produce the catfish that are sold within their province. That is not true. Interviews with broiled catfish retailers say that their supply comes from Bulacan. Marketplace retailers in Bayambang and Bautista, two Pangasinan towns that retail catfish everyday attest to this source.

Ramos says that growing catfish is simple as he has been farming catfish since 1989. He started with a few small ponds (sizes 200-500 m²) adding more ponds as he made profit. Although small and in varying sizes, he now has 16 ponds totalling more than a hectare. He doesn't do much to prepare his ponds. After emptying a pond, for example, he stocks again after about 1 or 2 weeks. He doesn't treat predators as they rarely affect his stock.

He stocks 15 fingerlings per m². He says, "for 15,000 fry that I stock, I harvest about 1.5 to 2 tons after 80-90 days." When

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Laureano Marquez owns one of the big catfish farms in Pandi, Bulacan and uses swine pellets instead of aquaculture feeds



Ex-councilor Rolando Ramos harvests 2 tons each week from his catfish farm and thinks highly of the bright future of the catfish industry. If he had more resources, he would certainly expand his production as present supply is hardly able to cope with demand. He says that if he can produce 5 tons a week, it would still sell as briskly as his present production



Skewered catfish are sold cooked in roadsides along Northern Luzon mainly in Pangasinan province



fingerlings are small, he feeds them twice daily and when they get to be about 5 inches long, he feeds daily. But his daily feedings do not consist of aquaculture feeds (floaters) only. His main feed is chopped trash fish (*galunggong*, round scad) or chicken entrails (large intestines). He doesn't cook them as he claims that they are fresh and delivered to him daily from a nearby chicken farm and trashfish dealer.

Ramos changes his pond water as frequently as he can (3-4 times a week) because his ponds lie adjacent to an irrigation canal. Thus, while pumping, water in the irrigation canal gets to his ponds first, and empties to the nearby ricefields. He claims that the rice (he also owns a small parcel of rice field) grow very well as he feels that the leftover feeds become fertilizer for the rice.

Sometimes when the weather gets too cold, mortality occurs. The biggest mortality he has experienced was 20%. With this mortality, he still gets a good profit. For every kilogram he sells, production cost ranges from P15-P20 a kg to cover cost of fingerlings and feeds. Farmgate price is P52 for orders more than 1 ton and P60 for less

than 1 ton. Retail price is P70-80 a kg.

Diseases also occur. The most usual are whitening of the snout and skin sores. To prevent the disease from spreading, he treats his pond water with methylene blue and salt. Salt is placed in the pond water (enough to make water salty). Almost always, the catfish get better and minimal mortality occurs, if at all.

Ramos has 2,000 breeders that supply fingerlings to his and adjacent farm needs. At present, he sells fry (2-4 cm) at P1 each. Since he started breeding in 1990, he doesn't worry about availability of fry and high cost. "It used to cost P3 per fry when there were no hatcheries in Bulacan," he says. "Now with so many hatcheries operating, fry cost has considerably decreased. Bicol region, he says, has catfish farms but production costs is higher because few produce catfish. "People are just learning to like catfish there," he says.

Laureano Marquez also has a catfish farm in Pandi, Bulacan. Like Ramos, his ponds vary in sizes (12 ponds) to total about one hectare. He also started with a few ponds in 1996 and gradually expanded. As townmates, Ramos and Marquez use the

same protocol for grow-out except that Marquez doesn't have a hatchery. He buys his fingerlings at P1 apiece. He feeds with trash fish and pellets but pellets are his main feed. He uses swine pellets instead of fish pellets because it is cheaper (similar to Suoribio's small farm operation).

He changes water twice weekly to avoid diseases. He says that catfish are prone to infection when water is not changed frequently. He identifies diseases similar to Ramos but adds one more: reddening of the head. When disease occurs, he treats his 200 m² pond with methylene blue and 1 sack salt (for 1 m water depth) or 1 pail salt (for 1 ft water depth).

Marquez says that harvest for 30,000 fingerlings reach as high as 6 tons on good days (not unlike the production of Ramos). "In three years, I have had only three good harvests. All my other productions are only half that amount," he says. He attributes his unsatisfactory harvests to not having a hatchery. He said he spends more, thus, he gets lesser profit, compared to those who own hatcheries.

His buyers are from the Ilocos and Pampanga provinces. ☞ page 33



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Summary

The catfish industry in the Philippines is budding and projected to expand in the coming years. This is evident from conversations with active catfish farmers who all hope to be able to expand production, whether backyard or commercial because their present production can hardly supply the demands of buyers.

NIFTDC a fisheries technology and development center in Dagupan City, however, says that unless the government has a catfish program, expansion of the industry would be slow. Work on catfish research is only just starting and the culture methods remain to be on a gut feel basis. The farmers are left to survive on their own. Luckily for them, catfish is hardy, easy to grow, and has a growing market. Clearly, if catfish can provide cheap protein for more people, scientific support must be made available for the farmers.

POSTSCRIPT

The Mangabol Lake (located between the provinces of Pangasinan and Tarlac) used to be the biggest source of catfish (native or hitong tagalog, *C. macrocephalus*) in Luzon, perhaps even the Philippines (Philippine Fisheries, 1952). An annual festival used to be held in the area, according to people in Bautista, Pangasinan. Fishers from all over Luzon would gather in Mangabol Lake, and on the day of the festival, a fog horn would sound and fishers simultaneously dive into the lake with their snare. The diver who got the biggest catch would win a prize (usually prestige). But the 1991 Mt. Pinatubo eruption overran the lake and Mangabol Lake remains to be unproductive until the present time.

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running water and then placed inside the incubators. Incubators can be made of marine plywood or plastic basin with a flow-through water system and provided with aeration.

Pituitary glands can be dissected from the heads of sacrificed male catfish. Pituitary glands contain hormone(s) that can also be used to spawn the female catfish in subsequent runs.

Fertilization and hatching

Using the above procedure, fertilization rate can reach more than 90%, while hatching rate may range from 30 to 70%. When stripped, there are approximately 100 eggs per gram body weight of the female fish; about 500 eggs are contained in one gram. A female catfish has 20-25 g of stripped eggs on the average.

Hatchery and nursery rearing

Larvae can be maintained for four days in the same incubators without feeding. Catfish larvae are then transferred to bigger tanks and fed with newly hatched *Artemia* nauplii for three days and *Moina* for four days. Thereafter, larvae are given formulated feed of 150-200 microns size that contains 44% protein. Two week-old catfish fry can be sold to grow-out pond operators, who are advised to rear the fry in net cages suspended in either tanks or ponds. Or, the fry are reared further for 4-6 weeks in bigger nursery tanks or ponds to reach 3-5 cm, the appropriate size for stocking in grow-out ponds:

Packaging and transport

Catfish fry are counted and graded according to size, and then placed inside a plastic bag half-filled with water at 500 to 1000 fry per bag. The bag is thereafter oxygenated and tied. Native "bayong" bags may be used to hold the plastic bags in, when transporting a short distance only. When transporting by plane however, the plastic bags are better placed in styrofoam boxes with crushed ice filled to the brim.—NJD