

Revisiting the Philippine shrimp industry

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

Most people think that the Philippine shrimp (black tiger *Penaeus monodon*) industry is near extinction. Taking a signal from the 1996-organized Department of Agriculture shrimp task force *Sagip Sugpo*, the name suggests that the shrimp industry had to be rescued. It had to be rescued from the 1990 crash when crops were totally wiped out by disease, specifically in Negros Province. Negros was producing 12,000 tons per annum with an export price of US\$120 million, while the Philippines occupied the number 4 slot in world production. Today, we do not belong to the top five producing countries.

While it is true that shrimp farming in Negros is almost nil, in some provinces, processing plants still continue to export, hatcheries still produce fry, and feed millers are not totally unhappy. Thus, some say that the Philippine shrimp industry is not synonymous with Negros. Based on several personal conversations, the shrimp industry is alive and well, perhaps not growing exponentially as in the Negros experience, but producing enough to supply almost 70% of Japan's import demand from the Philippines. With farming innovations vis-a-vis ponds' carrying capacity, the shrimp industry is thriving in northern and southern Mindanao and in some parts of Leyte and Masbate.

A glimpse of the shrimp industry according to a Cebu feed company:

Location	Area (ha)	Stock density (per m ²)	Survival (%)
Batangas	68.6	20-40	66-73
Visayas	391	12-30	65-87
Bohol	50	4	95
Butuan	0.4-51.5	0.8-11	75
GenSan/Davao	234	4-40	60-80
Cagayan de Oro	37	3-10	60-80



Mr. Libarios identifies two problems in the industry -- diseases and feed cost. He says that if one is solved, the industry will thrive

The Cebu experience

In 1995-1997, according to Mr. Louie Libarios, shrimp farms in Cebu produced enough to supply his processing plant which can process 5 tons daily for export (selling price, US\$7.50-11.50 per kg). Libarios had 300 ha productive intensive farms; now it is down to less than a hundred with very faulty production. Some ponds produce while others don't, but then again, the ponds that produce may not produce the next time and the ponds that didn't, may produce. He identifies two big problems that may see the final collapse of the industry if nothing is done about them: disease and high feed cost.

Saying that if one is solved, the shrimp industry may be a world competitor again. He sees a trend in shrimp farming. He believes that a shrimp producing area has a certain productive du-

ration, and once reached, will not produce again. It was Negros in the late 80s, Cebu in 1995, and now it is the northern Mindanao area. The next, he said, would be southern Mindanao.

Libarios says that it would help exporters if the "auxiliaries" of the Bureau of Fisheries and Aquatic Resources (BFAR) would be abolished. They make shipment from farms extremely difficult. For example, if a harvest from Ormoc, Leyte has to be shipped to Cebu for processing on a Saturday or at 10:00 PM (outside of office hours) fisheries permit can not be obtained. If one forces shipment without a permit, on the way, police and military personnel extort grease money to allow shipment. "There is too much corruption. The DTI, PhilExport, and even the DOST are a big help for us exporters, but not the BFAR," he says.

The northern Mindanao experience

The Guisan multi-purpose cooperative in Magallanes, Agusan del Norte has 176 members, all shrimp producers. Members own from 0.8 to 5 ha shrimp ponds which they stock with 2-3.5 shrimp per m². Most



Ms. Gina Regalado, marketing officer of a feed company, says that feed companies continue to be profitable

Mrs. Lorna Nakila (right) of the Guisan Multipurpose Cooperative in Magallanes, Agusan Norte; Mr. Gaudencio Dolar tends to a 5 ha pond registered with the cooperative; the monitoring board of the cooperative showing owner's name and varied information regarding the ponds



MON							
FARM NAME	APLA	DATE STOCK	STOCKING DENSITY	DOC	SAMP DATE	ABW	
KKK-ROAD	1	5/30	6/21/99	175,000	54	8/13/99	7.22
ROAD	1	5/30	6/21/99	175,000	54	8/13/99	7.69
NICMIG	1	1/80	6/21/99	85,000	77	8/13/99	16.55
	2	3/20	6/21/99	150,000	77	8/13/99	9.22
	3	2/25	6/21/99	95,000	78	8/14/99	15.88
LLANOS	1	2/40	6/22/99	84,000	53	8/15/99	5.60
	2	2/0	6/22/99	70,000	53	8/15/99	6.42
	3	0/60	6/22/99	21,000	54	8/14/99	8.77
	2	2/30	6/22/99	81,000	54	8/14/99	6.62
S.K.M	1	1/44	5/29/99	80,000	79	8/14/99	9.03
OSEJAS	1	2/0	6/22/99	70,000	53	8/13/99	7.92
	2	2/80	6/22/99	112,000	53	8/13/99	6.04
	3	3/20	6/22/99	98,000	53	8/13/99	4.32
FRACAZA	1	0/30	6/22/99	10,000	42	8/14/99	3.88
	2	3/50	6/22/99	112,000	53	8/13/99	6.93
	3	1/20	6/22/99	92,000	54	8/14/99	7.23
SALON	1	1/0	5/30/99	55,000	56	8/18/99	5.12
	2	2/70	5/30/99	120,000	77	8/18/99	11.02
	3	2/50	5/30/99	120,000	77	8/18/99	11.33
DESHATAN	1	2/0	5/20/99	65,000	60	7/24/99	7.76
	2	3/0	6/21/99	55,000			
CATAHUA	1	2/50	6/20/99	100,000	67	7/24/99	12.93
SALUS	1	1/50	5/18/99	44,000	67	7/24/99	12.62
MAGDAS	1	3/0	5/18/99	105,000			

farmers started farming in 1985 and have since been producing. With survival of 80%, farmers get a good profit. The cooperative has grown from a capital of P55,000 to P1.7 million with services such as shrimp financing, mini-banking, and lending. Today, 316 ha are operational.

The municipal government of Magallanes has passed a municipal ordinance to control stocking density in the shrimp farms to "conserve soil fertility and ensure continuous production." No one can stock more than 10 per m² in the shrimp farms. They have no fry supply problems. Hatchery fry are supplied through early notice.

Mr. Gaudencio Dolar, a technician of a 5.5 ha pond describes a 1 crop operation. Before stocking, he would usually scrape off the black soil which is the waste accumulated by the preceding crop, dry his pond bottom, then apply lime.

He stocks at a rate of 3.18 shrimp per m². He starts feeding one month after stocking, 5 times daily. When shrimp is 20 g, flushing is already required. At this age, he says, tidal flushing is not sufficient. His shrimp grow at 0.5 g daily to reach 30 g after 20 more days of culture.

Agusan del Norte and Surigao del Norte. Mr. Joel Ceniza operates a 23 ha farm for Oro Marine Resources in Ambago, Butuan City since 1997. He stocks 25-30 shrimp per m² and gets an 80% survival in his good ponds (6 ha). But the rest of his ponds (17 ha) do not produce as much. Even if he produces only in some ponds, a profit can still be made and can offset the

losses in the other ponds. He thinks that when ponds are not properly drained during pond prep, production is not good. His boss does not allow him to stock less but in his own farms, he practices extensive farming (2.5 per m², 18 ha in Bacuag, Surigao del Norte). Ceniza says it is much better to go extensive because he can farm longer with a steady profit. The profit may not be considerable but he believes that he would be able to farm for many years more. He says that at a stocking density of 3 per m², at 60% survival, would make 50% profit on capital.

With regards to setbacks in production, he believes that low stocking density is not the key to success in shrimp culture but clean freshwater supply. He also believes that if stocking is intensive, probiotics is a big help. For example, in the Oro Marine Resources ponds, he spends P45,000/ha/cropping. He has no luminous bacteria problem but MBV, black gills, and a sort of algal infection that is characterized by barnacle-like adhesions on the shrimp shell are the diseases that occasion-



Mr. Ceniza thinks that stocking at less than 3 shrimp per m² is the best method he has tried so far. He tends a 23 ha farm for a friend but has his own 18 ha farm



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Shrimp for export. The Philippine industry is alive and well, thanks to persistent farmers. It has also learned a few lessons from the past while new practices are being developed



ally occur. He identifies poaching as a really pesky problem. Thieves work so fast in the farm. Two security guards are unable to patrol 23 ha of ponds despite high powered lighting. Almost always, thieves are the cause of sleepless nights when shrimps are the size that can be sold in the local market.

Processing

The HJR shrimp processing plant in Cebu City exports an average of 105 tons a month sizes 40-25, head-on and headless to Japan. But Mr. Vicmando Suliva said the market is lucrative because they have hardly scratched the surface. In reality, the shrimp market is limitless, he says. This is only one of several shrimp processing plants now operating in Northern Mindanao and Cebu. The Cebu processing plants process shrimp from all over the Philippines as buying stations are located in identified shrimp producing areas. One shrimp feed company is set to open a processing plant in the Davao Fish Port with a daily capacity of 5 tons. President Marine Processing Plant, also in Cebu City, is said to produce so much more than what HJR processes monthly.

Shrimp processing is an established method. From the farms, shrimp are picked, washed, sorted, resorted, classified, layered, frozen, packed in either 1.3 or 1.8 kg blocks, sealed, and stored in refrigerated storerooms. A 4 t shipment can be processed in 3-4 hours. Processing is done manually as the only mechanized portion is the freezing.



Options for intensive culture

Mr. Franic Y. Domingo, CEO of FYD International Inc. in Bacolod City uses his company-developed "Tilapia-water Introduction on Prawn Systems" or TIPS method. This method incorporates the culture of tilapia and shrimp in one pond wherein luminous bacteria population is controlled or eliminated. The luminous bacteria (*Vibrio*) caused the disease that wiped out the Negros shrimp industry in the late 1980s and early 90s. As one of the shrimp pioneers, he caught the boom and of course also the crash. Today, he estimates that less than 10% have been able to get back into the shrimp business.

In an interview, Domingo described the TIPS process in former ponds used for shrimp culture. Two adjacent ponds each 0.5 m² are stocked separately with tilapia and prawn. Tilapia used are jewel tilapia, an all-male saline tolerant hybrid (offspring of female *Tilapia mossambicus* and male *T. hornorum*). Water is pumped from the sea to tilapia ponds and allowed to stay for three days to "cure" the water. On the 4th day, water from the tilapia pond is pumped into the prawn pond where the pond may already be stocked with prawn. Water depth

Mr. Domingo, CEO of FYD International Inc. discusses TIPS technology, a shrimp farming technique that uses jewel tilapia water. He urges shrimp farmers to try TIPS as he has proven its success in his own farms



for the prawn must be at least 80 cm.

The tilapia pond is stocked at 30,000 - 35,000 per ha and must have a biomass of at least 3 tons per ha. Prawn is stocked at 18 per m². Throughout the culture period, pure tilapia water is used with a minimum of 5 changes per 2 weeks.

Within the 0.5 ha shrimp pond, four 10 x 10 m cages each stocked with 750 pieces of jewel tilapia weighing 200-250 g are maintained throughout the culture period in addition to the pure tilapia water pumped in from the tilapia pond.

With the jewel tilapia water, Domingo has harvested shrimp 4 times; production is 5 tons per ha; survival is 85-90%; FCR is 1.6. Last month, August 1999, he harvested 5 tons from a 1 ha pond; 3 tons and 2.6 tons from two 0.5 ha ponds, respectively. Aside from the tilapia water, the usual shrimp culture protocol is one that is generally used.

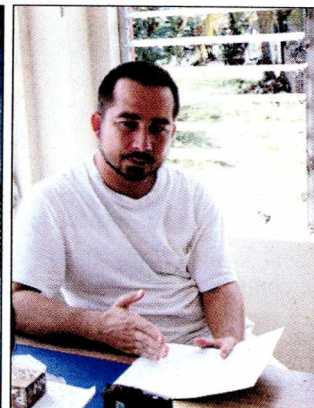
With his experience with the jewel tilapia water, Domingo assures shrimp farmers that: jewel tilapia biomass is inversely proportional to luminous bacteria population (the more tilapia, the less bacteria); shrimp growth rate is an ascending trend within accepted daily growth rates, FCR, survival rates; at 3.0-3.5 tons tilapia biomass; there is no increase in luminous bacteria population; and luminous bacteria can be controlled or eliminated by jewel tilapia water. Domingo is confident that the



The intensive shrimp pond has four cages stocked with tilapia. The tilapia water controls luminous bacteria in the shrimp pond to levels that do not affect production



The lowly tilapia may yet put back the glow in the eyes of shrimp farmers who own idle shrimp ponds. It may signal the rebirth of intensive farming and put the Philippines back on the world shrimp map



Mr. Valmayor says that shrimp production methods stay in a trial-and-error level, a stressful day to day operation

TIPS technology would rehabilitate the shrimp industry to become a major dollar earner once again. He sells tilapia fingerlings and he is also willing to help shrimp farmers who want to try TIPS.

Mr. Jingo Valmayor of San Carlos City in Negros Occidental has been raising shrimp since 1986. In 1995, disease struck, and since that time, he was never confident with his culture methods. Nevertheless, he continues to raise shrimp. He tried to raise *bangus* instead, but he made more losses because of poor price. "Shrimp profit covered our losses in milkfish," he says.

But 1986 to 1995 was not exactly smooth sailing as one would think. Those years were luminous bacteria-free but in 1988 and 1989, price of shrimp was not lucrative. He got the lion's share of the market when the northwestern Negros area was disease infected and he enjoyed a relatively competition-free market. Valmayor stocked to as high as 30 per m².

When disease struck in 1995, he did not lose hope. He stocked his 3.5 ha ponds initially -- 15 per m² -- and used probiotics. With pure probiotics, he had a good production, 80-85% survival, 5 tons per ha harvest. He then increased his area to 11 ha. But probiotics is expensive (P52,000 per ha). To reduce production cost, he revised the probiotic protocol by lowering

the recommended dose when the ponds were problem-free but doubled it when disease was imminent. With the probiotics, he also applied antibiotics in his ponds. Just before 30 days, he would apply antibiotics because he claims that this is when the shrimp are most vulnerable to disease. But throughout the culture period, he used probiotics in the water. In the feed, probiotics was not added when antibiotics was applied.

While Valmayor enjoys a generally good production today, he is never 100% successful. Of his 15 ponds (11 ha) in 1998, three ponds were aborted due to luminous bacteria. Initially, with his combination of antibiotics and probiotics, his harvests were good as he would usually notice relief once antibiotic was added at the first indication of disease. But now, Valmayor says that resistance might have already set in because some of his stocks were completely wiped out. He is now ready to try his back-up methods and intends to stop using antibiotics.

He has reserved four ponds for the TIPS Technology (mentioned in preceding paragraphs) and of course he stocks milkfish when shrimp die. He has also reserved some ponds for raising shrimps similar to the time when he only had to stock shrimps, wait for 120 days, and then

harvest. But he is never sure about his solutions for every problem encountered. It is a hit or miss, day to day, pond to pond operation. But Valmayor says that he would still raise shrimps despite setbacks. As long as no new diseases occur, the shrimp industry would stay, he said.

Conclusion

Most shrimp farmers have now learned their lesson. From the recent conversations, the farmers are now aware of the problems of intensive production and the irreversible damage on surrounding areas. Even local government units have joined the pursuit for environmental causes with prodding from government financing institutions. Perhaps the reasons for pushing for sustainable production is not so much as to its being a noble cause but to ensure the collection of loan payments. Being that as it may, the shrimp farmers have learned to stock less and the promise of sustainable production looks bright.

Acknowledgement

The authors wish to thank the following: Mrs. Pena, Director, Training and Extension; Ms. Ana Belga and Mr. Larson Tan of the Bureau of Fisheries and Aquatic Resources, Cebu City; Ms. Gina Regalado, Ms. Arlene dela Vega, Mr. Mousy Mella and Mr. John Lozada of INTAQ; and the other informants and interviewees mentioned or not mentioned in the text.