



## INTERNATIONAL JOURNAL OF RESEARCH IN COMPUTER APPLICATION AND MANAGEMENT

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**EMERGING NEW MARKET PENAEUS VANNAMEI CULTURE IN INDIA****ASLAM CHINARONG****RESEARCH SCHOLAR, SATYABHAMA UNIVERSITY, CHENNAI****GENERAL MANAGER (FINANCE & CONTROL)****M/S. C P AQUACULTURE (INDIA) PVT. LTD.****104, G.N.T. ROAD, NALLUR & VIJAYA NALLUR VILLAGE, SHOLAVARAM POST, RED HILLS****CHENNAI – 600 067****DR B.YAMUNA KRISHNA****PRINCIPAL****SRI RAMACHANDRA COLLEGE OF MANAGEMENT****PORUR****CHENNAI****ABSTRACT**

*Shrimp culture is the biggest contributor to the coastal aquaculture throughout the world. The potential brackish water area available in coastal regions of country for shrimp culture is about 1.2 million hectares is under culture. The export of cultured shrimps from our country is about 50% of the total shrimp exports. Hence there is a vast potential for further development of coastal shrimp aquaculture in our country. But the rapid increase in shrimp farming in the last decade has resulted in environmental and social concerns. However these concerns are now largely taken care of and the social acceptability of shrimp farming has been attained. To increase the production of shrimp farming aquaculture many issues and ideas are being discussed in recent times and some of them have resulted in fierce debates and sharp polarization of views.*

**KEYWORDS**

Liberalization and Globalization, Market Potential, Economic

**INTRODUCTION**

*P. vannamei* was introduced into Asia experimentally from 1978-79, but commercially only since 1996 into Mainland China and Taiwan Province of China, followed by most of the other coastal Asian countries in 2000-01. Experimental introductions of specific pathogen free (SPF) "supershrimp" *P. stylirostris* have been made into various Asian countries since 2000, but the only country to develop an industry to date has been Brunei.

Beginning in 1996, *P. vannamei* was introduced into Asia on a commercial scale. This started in Mainland China and Taiwan Province of China and subsequently spread to the Philippines, Indonesia, Viet Nam, Thailand, Malaysia and India. These introductions, their advantages and disadvantages and potential problems are the focus of this report.

China now has a large and flourishing industry for *P. vannamei*, with Mainland China producing more than 270 000 metric tonnes in 2002 and an estimated 300 000 metric tonnes (71 percent of the country's total shrimp production) in 2003, which is higher than the current production of the whole of the Americas.

Other Asian countries with developing industries for this species include Thailand (120 000 metric tonnes estimated production for 2003), Viet Nam and Indonesia (30 000 metric tonnes estimated for 2003 each), with Taiwan Province of China, the Philippines, Malaysia and India together producing several thousand tonnes.

Total production of *P. vannamei* in Asia was approximately 316 000 metric tonnes in 2002, and it has been estimated that this has increased to nearly 500 000 metric tonnes in 2003, which is worth approximately US\$ 4 billion in terms of export income. However, not all the product is exported and a large local demand exists in some Asian countries.

Thanks to SPF domesticated white shrimp, *Penaeus vannamei*. Suddenly the shrimp farming business is back on its feet again. The surge amongst farmers, hatchery operators, feed millers and the processing plants have renewed confidence and enthusiasm towards the shrimp industry. With the staggering white shrimp global production of 76 percent in 2007 from a mere 23 percent in 1996.

**P.VANNAMEI IN INDIA**

- ✓ During 2001 & 2002, both scampi culture and monodon culture had been come down due to severe disease out break in AP.
- ✓ Sharath Industries and BMR in Nellore, AP applied to Ministry of Agriculture for introducing *L. vannamei* in India. (2002)
- ✓ Sharath Sea Foods & BMR got permission for Vannamei culture in the terms of pilot project in year 2003.
- ✓ They can import brood stock & produce seed and culture only in their own farm.
- ✓ They can't sell the seed to the farmers.
- ✓ Sharath & BMR started each 50 acres for trial purpose with 50 pc stocking density in 2003 in second crop
- ✓ During the First crop, Harvest size was 20 g, survival rate was 90 % & their FCR was 1.5.
- ✓ Both Sharath & BMR has been doing culture in full swing.
- ✓ Sharath went for 100 pc/m<sup>2</sup> stocking density on earthen pond culture( no P.E.line ponds).
- ✓ Harvest system – Partial harvest & Closed harvest. They used to do partial harvest when the animal reach 15 g size & then closed by when the size reach the 20 g.
- ✓ In 2004, Sharath supplied seed to 2 farms in Gangapatnam. Those farmers started with 40 pc/m<sup>2</sup>, harvest size was 20 gms with 130 DOC. They did 20 acres & got good success.
- ✓ BMR supplied seed to their close relatives in Iskapalli village and stocked with density of 20 to 30 pc/m<sup>2</sup> & got good culture
- ✓ In 2008, Court issues the order to close the farms in particular village. Whereas in Iskapalli, farmers has been doing culture with out any social issues.
- ✓ During this year, In Iskapalli village farmers had failed in vannamei culture due to unidentified disease outbreak.
- ✓ In Mudivarthi Village, Big Farmers like Baskaraiah & Radhaiah started vannamei culture & got good success.
- ✓ Ministry of Agriculture issued notice through CAA to both Sharath Sea Foods and BMR, mentioned that they should stop all their activities before end of June 2009.

**INDIA TO START WHITE PRAWN PRODUCTION**



The Union government will allow cultivation of white prawn (*Penaeus vannamei*) in India from the ensuing stocking season in February 2010, according to NFDB chief executive officer, P. Krishnaiah.

India's *Business Standard* reports that *P. vannamei*, widely cultivated in the US, is seen as an alternative to tiger prawn (*P. monodon*), which is often afflicted by the white spot (virus) attacks. The demand for introduction of vannamei has been a long-pending demand of shrimp growers and traders as they feel there is a good export market for the species.

Shrimp culture in the country, predominantly black tiger prawn project (*P. monodon*), has declined from 106,165 tonnes in 2007-08 to 75,996 tonnes in 2008-09 – a fall of 28.4 per cent. The total export of shrimp and scampi (lobsters) from India during 2007-08 was valued at 28.36 billion rupees (INR), compared to INR 37.77 billion the year before and INR 36.05 billion in 2005-06.

Typically, a kilo of black prawn (20 to 25 prawns) fetches about INR 275 to 300. With the white spot virus becoming rampant among the wild species, the profitability decreased and many shrimp farmers have run into difficulties.

Keeping in view the demand for quality shrimp seed, the NFDB has decided to set up a specific pathogen-free (SPF) shrimp seed plant for the black tiger prawn project at Mulapolam village in Srikakulam district of Andhra Pradesh together with Moana Technologies, a Hong Kong-based company with a proven record in SPF research for the species. SPF does not mean that shrimp are completely disease-free.

The NFDB had already acquired 100 acres of private land for the project estimated to cost INR 40 million. NFDB's role is to create hatchery infrastructure and then lease out the facilities to Moana Technologies, which will have a production capacity of three billion SPF seed a year.

But now, the SPF project is in troubled waters, reports *Business Standard*. "The project is mired in technical issues as Moana is now looking at replacing its partners in India. The project is not off," Krishnaiah said, adding that NFDB had asked Moana to prove its funding capabilities before setting up the required infrastructure. The NFDB is now preparing to call tenders for the civil works of the project.

For some time, the Central Aquaculture Authority allowed *P. vannamei* to be cultivated in India but only after pilots. The Centre created a quarantine facility in Chennai and approved 24 hatcheries to supply the vannamei seed. In Andhra Pradesh, BMR and Sharath Industries have conducted pilots for *P. vannamei*.

A kilo of white prawn, even if the count is above 30, fetches a price of up to INR 200 in the export markets, Mr Krishnaiah said, adding that *P. vannamei* was low-cost, high-density species that could depend on bacterial, algal flocks and rotifers in the water. On the other hand, *P. monodon* is more carnivorous and requires higher protein feed. The SPF broodstock for *P. vannamei* is available from the US. However, without SPF and biosecurity, producing consistent post larvae will be difficult and will affect the farm economics, he said.

Andhra Pradesh, which has 50,396 hectares under shrimp cultivation with 199 hatcheries, contributes over 50 per cent to the country's shrimp production. Last year, the state produced 56,557 tonnes. The state also leads in scampi (lobster) production (19,887 tonnes last year) on 38,819 hectare.

The profits from *vannamei* farming were almost three times greater than those for *monodon*.

Comparison of <i>P. monodon</i> and <i>P. vannamei</i> Production in Thailand		
	<i>P. monodon</i>	<i>P. vannamei</i>
Density in Postlarvae Stocked Per Square Meter	40 to 50	120 to 200
Crop Duration in Days	110 to 140	105 to 120
Harvest Size in Grams	22 to 28	21 to 25
Yield in Metric Tons Per Hectare	8	24
Crop Value in USA Dollars Per Hectare	\$45,000	\$96,000
Crop Costs in USA Dollars Per Hectare	\$32,000	\$60,000
Production Profit	\$13,000	\$36,000

**IMPORTANCE OF THE NEW MARKET IN INDIA**

L. Vannamei culture should be allowed in our country for the following reasons:

1. L.Vannamei has now proved to be the best alternative for P.monodon ( Black Tiger Shrimp ) all over the world , particularly in Thailand, Vietnam and China,
2. It is very cost competitive in the World market.
3. The advantages of L Vannamei are the possibility of domestication of broodstocks, lower protein requirement in feeds, rapid growth rate, possibility of high stocking density and its registance to white spot disease.
4. In some areas of our country, like West Bengal and Orissa the cooler temperatures for about four months i.e. from 15<sup>th</sup> October to 15<sup>th</sup> February restrict the culture of P. monodon (black tiger shrimp). So only the crop/ annum is possible. In this case L Vannamei culture can help with the possibilities of 2 crops/ annum.
5. L.Vannamei is known to suffer from Taura syndrome virus (TSV) but there is no authentic record of TSV affecting P. monodon (black tiger shrimp). Hence the threat of TSV from L. Vannamei to P. Monodon (black tiger shrimp ) is blown out of proportion.
6. The Shrimp hatcheries in our country , about 260 nos. in total, having the installed production capacity of 11.00 billion seeds / annum are performing well below their capacities which has made many shrimp hatcheries commercially unviable . Production of L Vannamei shrimp seeds can help the shrimp hatchery sector.
7. The shrimp processing plants in the country are also operating at only about 20% of their total installed capacities because of lack of raw-materials. Additional availability of cultured Vannamei shrimp can increase the processing industry and also can increase the export of shrimp from our country.
8. L. Vannamei shrimp has a lower unit cost compared to P. Mondon (black tiger shrimp ). Hence it can be developed as an alternative for greater domestic consumption in our country.

**STATEMENT OF PROBLEM**

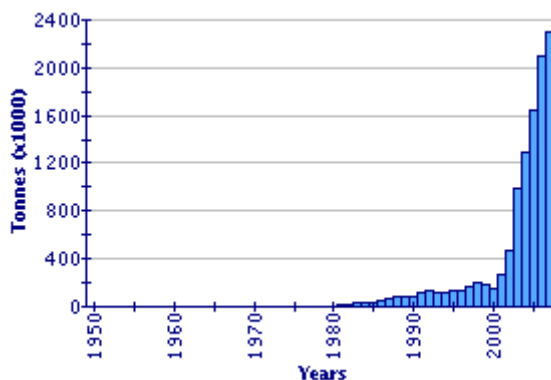
But to take an informed view, the following factors may be seriously considered before allowing L, Vannamei shrimp culture in India.

1. A comprehensive risk analysis study by a very competent agency should be carried out throughout our country from the very beginning.

2. A central quarantine facility with a large scale capacity is to be established to monitor all incoming L.Vannamei broods stocks from any/every source outside the country.
3. Only SPF ( Specific Pathogen Free ) certified brood stocks should be allowed in to the country only from approved and reputed suppliers .
4. A very few nos of Bio-secure hatcheries under strict selection procedures , should be selected as multiplication centers in order to produce SPF (Specific Pathogen Free ) broodstocks only.
5. To produce L. Vannamei shrimp seeds, hatcheries only with complete bio-security facilities should be licenced to operate at different coastal states.
6. For the first year of vannamei shrimp culture , only a few approved farms in different states should be selected . The selection of such farms, depending on strict technical criterias, should be done in consultation with the state Fisheries Department, regional MPEDA offices and respective farmer’s associations,
7. Continuous monitoring of such L Vannamei shrimp culture / SPF ( Specific Pathogen Free ) brood stock production facilities should be carried out throughout the first culture period by a national level committee.1.
8. all the above effects / activities should be completely reviewed after one crop in order to study its viability and risk potentials,
9. If the review supports L. vannamei shrimp culture in our country , then only it should be fully allowed to percolate down to small and medium farmers in all culture zones.
10. Then a set of suitable guidelines can be established for L. Vannamei shrimp culture in our country.

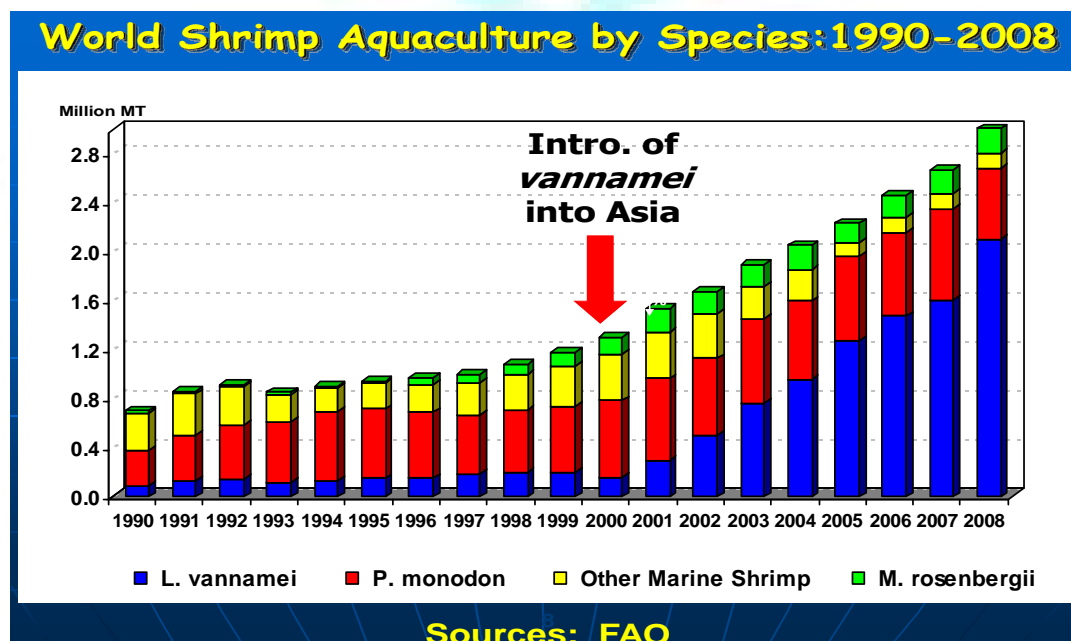
**PRODUCTION STATISTICS**

Global aquaculture production of *Penaeus vannamei* (FAO Fishery Statistic)



FAO statistics show that the total farmed production of *P. vannamei* increased steadily from 8 000 tonnes in 1980 to 194 000 tonnes in 1998. After a small decline in 1999 and a more significant decline in 2000 due to the arrival of WSSV in Latin America, FAO data show a rapid increase in production to over 1 386 000 tonnes in 2004, due to the recent rapid spread of this species to Asia. Main producer countries in 2004 were: China (700 000 tonnes), Thailand (400 000 tonnes), Indonesia (300 000 tonnes) and Vietnam (50 000 tonnes).

**STATUS AND TRENDS**



Sources: FAO



**DEVELOPMENT**

While the expansion of *P. vannamei* culture has been rapid in recent years, particularly in Asia, it has led to reduced value of harvested shrimp. This trend is expected to continue. Under such circumstances, the less efficient producers may not be able to compete with those capable of producing either more eco-friendly or cheaper products. Recent worldwide trends have been towards the integration of the industry, in response to the ever increasing requirement for traceability and control within the culture system.

**MARKET**

There has been a slowly increasing demand for shrimp in world markets, as capture fisheries stagnate and people became more affluent and conscious of healthy food choices. Despite the increased demand, the price for *P. vannamei* has been declining steadily. In the future, the market for *P. vannamei* is expected to become more competitive, due mainly to the saturation of export markets and reduction in world economic growth, as well as the emergence of non-tariff barriers in shrimp trade. Additionally, the industry will need to accommodate importing countries requirements on:

- Chemical residues.
- Food safety.
- Certification.
- Traceability.
- Eco-labelling.
- Environmental sustainability.

**RECOMMENDATIONS**

All shrimp farmers are becoming acutely aware of the growing need to farm shrimp in a responsible, traceable and low impact manner which can enhance biosecurity, and help protect the environment, whilst producing shrimp in a cost efficient manner. The newly developed intensive bacterial floc and super-intensive systems may have potential to address all of these concerns and should be investigated more thoroughly. In order to continue the growth of shrimp farming smoothly in the long term, domestic consumption should be promoted (as in China) to supplement the problematic export markets.

**CONCLUSION**

The funding for the above studies, facilities and monitoring can be arranged from all possible sources such as Public Private participation, funds from national Fisheries Development Board (NFDB) and central funds. In fact the National Fisheries Development Board (NFDB) should take the lead to implement such a large scale operation over a time frame of 2-3 years.

Above all the cost benefit ratio of such a large scheme should be studied particularly with emphasis on its impact on small farms, social concerns and environmental aspects.

No doubt we need our country to grow socially and economically. Aquaculture of shrimp can definitely play a role in this direction. All negative aspects of growth are always to be addressed in a developing country and we have the benefit of learning from the mistakes and experiences of other Asian Countries who have already captured a major share of World shrimp export market through *L. Vannamei*.

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