

Overview of Existing Shrimp Culture Industry and Development Potential for Culture of *P. vannamei* in Myanmar

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1. OVERVIEW OF SHRIMP CULTURE INDUSTRY

1.1. Historical production figures

Shrimp culture in the form of traditional method commenced in Myanmar in 1970s in the western coastal areas. The culture system was trap and hold method. Natural post-larvae of *Penaeus monodon* were trapped into the ponds during the high tide period. There were no inputs in terms of pond preparation, eradication of predators, water fertilization, feeding, etc. However, 30 to 50 kilograms of large size of shrimps were harvested. As the ponds were usually as large as 50 to 100 hectares, the shrimp production could provide more than enough money for the shrimp farmers. Having no laws concerned with aquaculture, those shrimp ponds existed as illegal ponds. Only in 2000 that the State Level Committee, which is the Shrimp Aquaculture Development Committee was formulated and implemented a three-year project plan of the shrimp aquaculture development in Myanmar.

According to that plan existing shrimp pond area of 26978 hectares was to increase in area of up to 48000 hectares. After the project in 2003, the shrimp pond area became 79984 hectares but it consisted of 2100 hectares of semi-intensive or intensive shrimp ponds. The production figure from shrimp culture was not properly registered. However, the production figure submitted to the State is as follows.

Shrimp production from different culture systems

No	Year	Extensive (mt)	Improved Extensive (mt)	Semi-Intensive (mt)	Total (mt)
1	2000-2001	3629.34	2359.95	1484.61	7473.90
2	2001-2002	4100.59	3366.79	3889.20	11357.08
3	2002-2003	6785.47	6009.55	6325.76	19120.78
4	2003-2004	6878.69	6016.75	6325.76	19221.20
5	2004-2005(January)	3530.37	13147.10	6731.22	23408.60

1.2. Shrimp Export

In 1989, Myanmar Government promulgated a Law Relating to Aquaculture and since then illegal fish-ponds and shrimp ponds have become legal culture ponds under the umbrella of the said law. It is only after the promulgation of this law that the established statistical figures were available. Thus, the shrimp exports of Myanmar in terms of quantity and value including capture and culture appears in Table 1. It is estimated that the shrimp production from aquaculture may be only 25 percent of the total export.

Table 1. Shrimp export of Myanmar (1993-2003)

No	Year	Shrimp Export	
		Quantity (mt)	Value (US\$ Million)
1	1993-1994	6195.00	45.10
2	1994-1995	7940.00	63.20
3	1995-1996	8814.50	72.40
4	1996-1997	12827.80	95.60
5	1997-1998	13467.20	91.90
6	1998-1999	13764.47	96.96
7	1999-2000	15536.01	90.68
8	2000-2001	19477.29	104.23
9	2001-2002	21453.87	94.40
10	2002-2003	22868.11	105.20

1.3. Problems in the industry

1.3.1. Disease out-break

By the time the three-year project plan was implemented, there emerged many private companies that became involved in shrimp aquaculture. Fast development in the shrimp culture resulted in inadequate supply of shrimp seeds as the production of shrimp seeds was very low due to limited number of shrimp hatcheries. So the shrimp farmers imported shrimp seeds and that must have caused the entry of uncertified shrimp seeds. That was the very first time that the semi-intensive and intensive shrimp farming in the country suffered the out-break of white spot viral disease and may have also caused the horizontal transmission of the disease.

1.3.2. Shrimp market price

Through the normal trade, shrimps are exported to many countries. But head-on chilled shrimps are normally exported through the border trade. The price of the shrimp has been very unstable and because of the low price, some farmers stop farming the shrimp using the intensive method. At the same time the cost of fuel for operating paddle wheels has increased tremendously. Sometimes, the selling price of the culture shrimp cannot compensate with the production cost. So the farmers stop farming or some has changed from the intensive system to extensive or improved extensive system of shrimp farming.

2. POLICY ISSUES ON THE IMPORT AND CULTURE OF EXOTIC SHRIMPS

2.1. Existing laws and regulations

There were no specific Fishery Laws until 1989. But the Government of the Union of Myanmar has promulgated four fisheries laws including a Law Relating to Aquaculture. According to the Myanmar Fisheries Laws, the term "Fish" is defined as all aquatic organisms living the whole or a part of their live cycle in the water including eggs, larvae, fry, post-larvae, juveniles etc. Aquatic organisms also include aquatic plants, seedlings and seeds. Under the Law Relating to Aquaculture, section 35 states that prior approval shall be obtained from the Department of Fisheries in terms of import or export of live fishes into and out of the country. To exercise this section, the Government of the Union of Myanmar conferred to the Department of Fisheries as sole the competent agency and the Director-General and Deputy Director-General as the sole competent personnel.

Meanwhile, basic concepts of the section in terms of conservation and preventive measures are also explained to potential importers of live fish in order to facilitate their application. Thus the importer has to comply with this section and the corresponding regulations mandated by the Department.

Apart from section 35 in the Law Relating to Aquaculture, there includes a last section (section 39 A and B) which states that the Minister for the Ministry of Livestock and Fisheries has the right to issue the proceedings with the approval of the Government and the Director-General of the Department of Fisheries also has the right to issue notifications with the approval of the Ministry of Livestock and Fisheries. Up to the present no proceedings and notifications with respect to Invasive Alien Species (IAS) have been issued yet. However, the Department of Fisheries is taking utmost care and commensurate safeguard on the importation of alien fish to Myanmar.

3. STATUS OF IMPLEMENTATION AND ENFORCEMENT

At present the import of exotic or alien shrimp species is strictly prohibited in Myanmar for safeguarding the natural ecosystem. This includes the import the *P. vannamei* and *P. stylirostris*.

4. CULTURE OF *P. VANNAMEI* AND OTHER EXOTIC PENAEID SPECIES

At the beginning of the three-year project plan in 2000, Department of Fisheries has allowed the importation and culture of *P. vannamei*. The DOF as the sole competent authority of fisheries sector, fully understanding that the vannamei has many advantageous factors for culture but it may also cause negative impact to the other shrimp aquaculture industry. Also the Department of Fisheries has been aware that vannamei may carry and outbreak the taura syndrome virus. However, the post larvae of blue shrimp *P. stylirostris* were imported in 2000 and the experimental culture was initiated. Due to very low salinity during raining season the survival was very poor and the species was no longer of interest among the shrimp farmers.

On the other side, the shrimp farmers made several request to DOF to allow the importation and culture of *P. vannamei*. In 2001, one private company was permitted to import 500 parent stocks of *P. vannamei* from Hawaii. Unfortunately or fortunately all the parent-stocks died on the way to the hatchery because of prolonged transport time. At the same time another shrimp farming company was allowed to culture *P. vannamei* in a far isolated area. That company imported one million post-larvae of *P. vannamei*. But it harvested only 4 tons and the company never requests the import of vannamei again.

The Department of Fisheries Myanmar consulted with the scientists from FAO, NACA, SEAFDEC and other agencies whether Myanmar should allow to import and culture *P. vannamei*. Almost all recommended that it was still value early to start vannamei culture. For these reasons, DOF Myanmar has suspended the culture of vannamei. At this moment, the shrimp farmers became fed-up with culturing *P. monodon* because of heavy losses caused by white spot syndrome virus. They are now very much eager to culture *P. vannamei*.

5. LABOR AND EMPLOYMENT GENERATED

Normally the DOF organizes a basic training on hatchery and grow-out culture operation for laborers once or twice a year and they are assigned to the private hatcheries and culture ponds. But for graduates of B. Sc or M. Sc, advanced training course on shrimp hatchery and grow-out culture operation are conducted by DOF once in a year or two years and after the training, some of them are appointed at the DOF and some are recruited by the private sector. The training sessions are mainly concerned with *P. monodon*.

Figure 1. Shrimp production from different culture systems

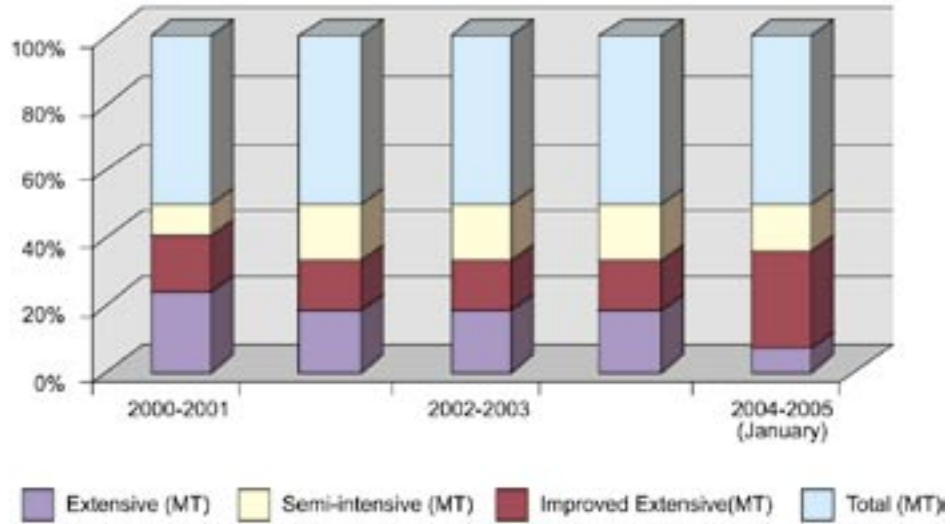
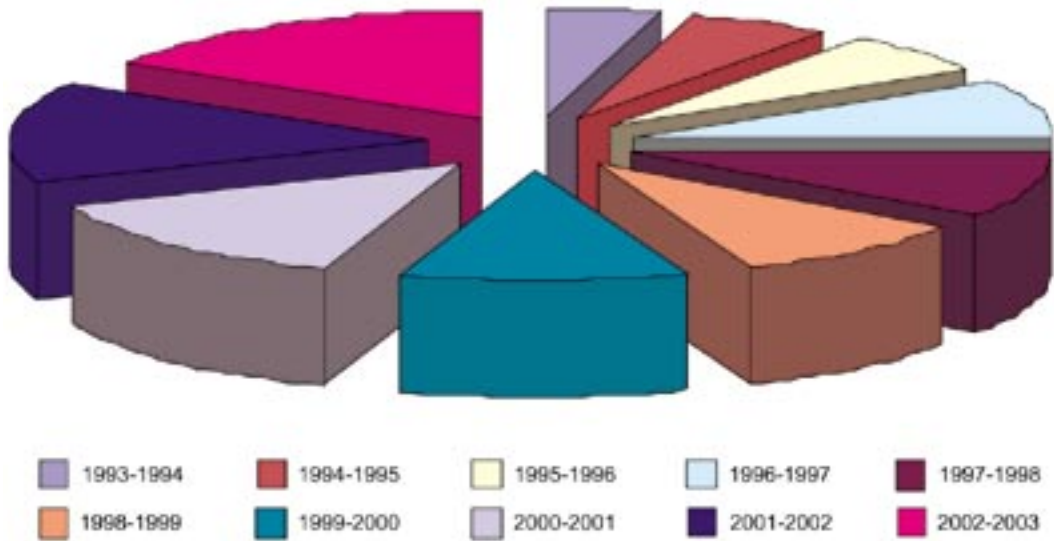


Figure 2. Shrimp Export: Export quality and value



6. R&D ACTIVITIES ON *P. VANNAMEI* AND OTHER EXOTIC SHRIMPS

Introduction of exotic shrimps including *P. vannamei* have not been allowed in Myanmar. Since then there were no activities related to research and development on *P. vannamei* and other exotic shrimps.

6.1 Development of local capability to produce brood stock including SPF and SPR

Local shrimp hatchery operators are operating hatchery management including collection of broodstock from the wild, ablation, broodstock management in the hatcheries, spawning, larval rearing etc. Supposing that *P. vannamei* and other exotic shrimps are introduced, there is a need to educate the operators to enhance their capability, and demonstrate to them the production of SPF or SPR broodstocks. This type of training and demonstration should be collaborated among SEAFDEC scientists and the host country.

6.2 Monitoring coastal areas and fish catch for occurrence of exotics species in the catch

Currently, there is no report on the occurrence of exotic shrimp species in coastal areas and fish catch. However, when exotic shrimp species including *P. vannamei* are introduced, regular monitoring in the coastal areas and fish catch and assessment of the negative impact on native species should be conducted. Principally, the introduction of exotic shrimp species is mainly for the purpose of aquaculture and the escape of those exotic shrimp species should be strictly and carefully prevented.

7. DISEASE OUT-BREAK AND MANAGEMENT

Presently, Myanmar has no source of taura syndrome virus since it has not allowed the introduction of *P. vannamei*. If ever the country would allow the introduction of *P. vannamei*, the best quality of SPF and SPR broodstock shall have to be imported and the newly introduced broodstocks are to be kept in confined and isolated areas.

8. PROPOSED GUIDELINES FOR THE INTRODUCTION AND CULTURE OF EXOTIC SHRIMPS

Despite some characteristics of carrying new virus like taura syndrome, *P. vannamei* is still a suitable species for introduction and culture. It can tolerate to low salinity and also low temperature. It can be cultured at a very high stocking density. Unlike the *P. monodon*, *P. vannamei* needs low profile of protein source in its diet and daily feeds. It can grow fast within 100 days of culture when it attains market size thus resulting in high production.

So the shrimp farmers willingly request DOF to allow the culture of *P. vannamei* in Myanmar. If the Asian and SEAFDEC countries have decisive recommendations on the introduction and culture *P. vannamei*, Myanmar shall also comply with the workshop decision in order to be in line with other Asian countries.

In such situation, the Department of Fisheries is the only competent authority for fisheries development. It should be mainly responsible for the introduction of SPF and SPR broodstocks of *P. vannamei*. In consultation with SEAFDEC/AQD and NACA, Myanmar would get the source of best quality SPF and SPR broodstocks.

Special training and/or workshops concerned with technology on hatchery and grow-out culture operation should be conducted in the host countries prior to the introduction of *P. vannamei* and other exotic shrimps. At the same time, the DOF and other competent fishery authorities should issue some appropriate guidelines to increase pond production and also safeguard the environment in the respective countries.