The current status and future prospects for the aquaculture industry in Malaysia

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Introduction

The aquaculture industry in Malaysia contributed 268,500 t (about 16 percent) to the national seafood supply, valued at about RM1.3 billion (US$0.37 billion; DOF 2007). It has great potential for further expansion due to favorable government policies. This sector recorded annual growth rates of about 10 percent from 1993 to 2007. The presence of vast bodies of inland freshwaters and the long coastline in Peninsular Malaysia (West Malaysia) and in Sabah and Sarawak (East Malaysia) on the island of Borneo, also bodes well for future aquaculture development. Malaysia is also a major global supplier of ornamental fish and aquatic plants.

Fish, shellfish and other seafood produced by the aquaculture industry contribute to both national food security and to bringing in foreign exchange for the country. The latter is especially true for high-value commodities such as farmed shrimp and marine fish which are mostly exported. Aquaculture of these high-value species has an important impact on the economy of the nation, including rural communities, by creating employment opportunities.

Malaysians are one of the highest consumers of fish in the world with 58.4 kg per capita annually from 2000-2002 (FAO, 2006a) up from 25.9 kg per capita in 1969-1971 period. With increasing affluence and population growth, the increase in local seafood demand will have to come from the aquaculture industry considering the stagnation in marine capture fisheries. Malaysia is currently a net importer of frozen fish valued at about RM1.1 billion (US$0.31 billion) annually. In 2006, Malaysia imported a total of 395,458 t of fish and other seafood, and exported 258,500 t (Department of Statistics, Malaysia). Self-sufficiency in seafood supply was about 90 percent (Mohd Farid, 2006).

This article provides an overview of the aquaculture industry in Malaysia with emphasis on its current status, new developments and future prospects. The current production figures for freshwater fish and shrimp, marine fish, marine shrimp, bivalves, seaweeds and aquatic ornamentals are presented. The various government policies and plans under the Third National Agricultural Policy for the expansion of the aquaculture industry are discussed.

Current Status

Freshwater aquaculture

The sector contributed about 26 percent of the total aquaculture production in 2007 (DOF 2007) with production coming from various culture systems such as ponds, former tin mining pools, cages and tanks/pens (18, 4, 3 and 1 percent, respectively) totaling 70,064 t (Figure 1). The three major freshwater species farmed in Malaysia are tilapia, catfish and carp constituting 46, 42 and 7 percent of total freshwater aquaculture production, respectively (Figure 2). Other freshwater species include snakeheads (Channa spp.), marble goby (Oxyeletris marmoratus) and giant freshwater shrimp (Macrobrachium rosenbergii). About 32,023 t of tilapia was produced in 2007. Unlike other countries where Nile tilapia is the major farmed species, the major tilapia species farmed in Malaysia is the red hybrid tilapia (Oreochromis

Fig. 1. Aquaculture production in Malaysia by culture systems in 2007 (DOF 2009).

Fig. 2. Freshwater aquaculture species cultured in Malaysia in 2007 (DOF 2009).
sp.), accounting for about 82 percent of total tilapia production, the remaining species being the Nile tilapia, Mozambique tilapia (*O. mossambicus*) or hybrids thereof. The major farmed catfish species are the African catfish (*Clarias gariepinus* or their hybrids), various *Pangasius* species and the bagrid catfish, *Mystus nemurus*, locally known as *baung*. Total catfish production in 2007 was 28,875 t. Various carp species such as grass (*Ctenopharyngodon idella*), Javanese (*Puntius gonionotus*), common (*Cyprinus carpio*) and big head carp (*Hypophthalmichthys* spp.), are farmed but production is relatively small, amounting to about 5,005 t in 2007. Aquaculture production of the freshwater shrimp amounted to only about 246 t in 2007.

**Marine and brackishwater aquaculture**

The major species in this sector is the blood cockle, *Anadara granosa*, at 49,620 t in 2007, contributing 18 percent to total aquaculture production (Figure 1) and 33 percent of the total production of 151,260 t of marine and brackishwater aquaculture in 2007 (Figure 3). Malaysia is currently the largest producer of blood cockles in the world. Large tracts of mudflats (about 6,900 ha) especially on the west coast of Peninsular Malaysia are ideal for the extensive culture of cockles. Other marine and brackishwater culture systems include those used for the culture of seaweeds (29 percent), along with ponds (25 percent) and cages (10 percent; Figure 1).

Penaeid shrimp production in Malaysia amounted to 11,435 t of the black tiger shrimp (*Penaeus monodon*) and 23,737 t of white shrimp (mainly *P. vannamei*) in 2007 (DOF 2009). However, Subramaniam (2008) estimated that in 2006, about 60,000 t of shrimp were produced, the bulk of which was *P. vannamei*. Industry estimates of farmed shrimp production in Malaysia in 2007 were about 70,000 t, with about 80 percent of the production coming from *P. vannamei* (Subramaniam 2008). The large increase from about 33,000 t in 2005 (DOF 2005) to 70,000 t within two short years was due to the farming of *P. vannamei*. This exotic white shrimp from South America was first introduced into Malaysia from Taiwan in 2001 and within a few years became the main species cultured locally. The main advantages of *P. vannamei* over *P. monodon* in an average production environment are higher growth rates, higher stocking densities, lower protein feed, better feed conversion ratio, the commercial availability of specific pathogen-free (SPF) and specific pathogen-resistant (SPR) broodstock and generally lower production costs.

In June, 2003, the Malaysian government banned the further import of *P. vannamei* due to concerns of Taura Syndrome Virus (TSV) and other viral pathogens. However, in April 2005, the Department of Fisheries subsequently permitted the farming of this exotic shrimp species but only using SPF postlarvae and broodstock from designated suppliers in the USA. Nevertheless, incidences of shrimp smuggled in from neighboring countries continue to plague the local industry. Despite the risks of introducing foreign shrimp diseases to local aquatic animal populations, local shrimp farmers continue to favor the culture of white shrimp.

Malaysia is arguably second only to China as a major tropical marine fish producer in the world. About 14,837 t of snappers, sea bass and groupers were produced in 2007.
collect live fish targeted for the lucrative marine fish markets of Hong Kong, China, Singapore and Korea.

**Ornamentals**

Ornamental fishes and plant production contributed 558 million pieces valued at RM825 million in 2007 (DOF 2009). Malaysia is one of the top five producers of ornamental fishes in the world. The state of Johor (nearest to Singapore) is the main producer contributing 65 percent of total local production. Cyprinids (goldfish, koi, barbs, danios) and poecilids (guppies, mollies, platies) constitute the major group (21 and 23 percent) of ornamental fish produced in Malaysia (Figure 4). The state of Penang is globally known as one of the largest centers for the mass-culture of various domesticated strains of discus, *Symphysodon aequifasciata*, an exotic species originally from South American rivers. Malaysia is also the largest producer of farmed Arowana, *Scleropages formosus*, with the Malaysian Golden Arowana being the most expensive indigenous ornamental fish.

**Increasing Aquaculture Production**

The Malaysian government has a target to produce 600,000 t of seafood from aquaculture by 2010 under the Third National Agricultural Policy (NAP3 1998-2010, MOA 1999). NAP3 is a guideline formulated by the Malaysian government for the development of the agriculture sector which includes the fisheries sector. It emphasizes development of a fully modern and commercialized capture fishery and aquaculture industry through exploitation of available resources on a sustainable basis. NAP3 promotes commercial aquaculture that will be adequately supported with modern fisheries infrastructure and comprehensive human resource development programs. To achieve the targets of NAP3, the local aquaculture industry would require an annual growth rate of more than 30 percent, which is extremely ambitious.

Table 1 shows the targeted increase in aquaculture production under the NAP3 plan. Based on the production levels as reported by industry sources and the Department of Fisheries in 2006-07, and the targeted production in 2010, it can be clearly seen that all sectors of the aquaculture industry still have some way to go before meeting the target. Total aquaculture production from all aquaculture systems in Malaysia in 2007 was estimated to be 268,500 t (DOF 2007) which is slightly less than 50 percent of the targeted increase to 580,000 t of farmed aquatic animals (excluding seaweeds).

Achieving the NAP3 target aquaculture production figures will put Malaysia closer to being on par with her neighbors as a major aquaculture producing country in the region. Malaysia is currently ranked around 20th in the world compared to Vietnam, Thailand and Indonesia, which are consistently ranked among the top five countries for total aquaculture production. In 2004, Indonesia, Vietnam and Thailand produced 1.5, 1.2 and 1.1 million t of farmed seafood (FAO 2006b), respectively, compared to Malaysia’s less than 200,000 tons (DOF 2006). To jump start the NAP3 targets for the aquaculture industry, the Malaysian government through the Department of Fisheries and other related activities.
Some varieties of the Discus fish

<table>
<thead>
<tr>
<th>Product</th>
<th>2006/07*</th>
<th>2010*</th>
<th>Requirement for aquafeed#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshwater fish/prawn</td>
<td>70,064</td>
<td>123,499</td>
<td>173,000</td>
</tr>
<tr>
<td>Marine shrimp</td>
<td>70,000</td>
<td>150,777</td>
<td>225,000</td>
</tr>
<tr>
<td>Marine fish</td>
<td>25,000</td>
<td>84,448</td>
<td>203,000</td>
</tr>
<tr>
<td>Bivalves</td>
<td>53,494</td>
<td>148,834</td>
<td>0</td>
</tr>
<tr>
<td>Total production</td>
<td>About 210,000</td>
<td>About 507,558</td>
<td>About 601,000</td>
</tr>
<tr>
<td>Ornamentals</td>
<td>558 million pieces</td>
<td>860 million pieces</td>
<td>Ad hoc basis</td>
</tr>
<tr>
<td>Seaweed (dry weight)</td>
<td>15,000</td>
<td>95,000</td>
<td>0</td>
</tr>
</tbody>
</table>

*Data based on industry estimates and DOF in 2007.
Targeted aquaculture production figures have been recently revised by the DOF.
#Estimated based on various feed conversion ratios.

organizations have embarked on several large scale projects, introduced policies to stimulate growth and mobilized funds. Some of these new developments are:

- A total of 330,200 ha of land and water bodies have been identified for aquaculture development, of which 35,000 ha are expected to be developed by 2010. The demarcation of these areas is: inland areas = 105,000 ha, open seas = 100,000 ha, coastal areas = 28,000 ha, lakes and impounded water bodies = 90,000 ha and protected coastal areas (e.g. lagoons) = 7,200 ha.

- The introduction of the concept of Aquaculture Industrial Zones (AIZ) is designed to encourage easier planning and organizing of the aquaculture industry thereby minimizing conflicts with other industries. To date, about 49 zones have been delineated and covered about 28,000 ha nationwide involving a total investment of RM1.6 billion.

- Development of standards for sustainable aquaculture practices which are compatible with the environment include the formulation of appropriate legislation and codes of practice for aquaculture. A national fish health management program for Malaysia that is of international standards has also been established.

- In terms of funding, AgroBank provides micro-credit scheme with a maximum loan of RM20,000 without collateral. Fund for Food (3F) provided by AgroBank (RM1.5 billion) for applicants with collateral who can apply for low interest loans of between RM10,000 to RM10 million. Various tax incentives such as tax-free status for the first five years in certain pioneer sectors, tax exemptions for agricultural machinery, investment tax allowances, etc. are also provided.

- Introduction of suitable modern technology, mechanization and training of locals are some measures taken by the Department of Fisheries, Malaysia, to increase mariculture production. Intensive research is being conducted on the artificial propagation of various groupers and snappers to meet anticipated higher fingerlings demand from the local mariculture industry.

- Initiatives for scientific and intellectual development in
the fisheries and aquaculture sectors include the invitation extended by the Malaysian government to host the headquarters of international organizations such as the WorldFish Center and Asian Fishereis Society in Malaysia. These world-renowned organizations are expected to further encourage the growth of the fisheries industry in Malaysia through their various research and academic programs.

- Last but not least, aggressive marketing, branding and seafood product promotions locally and overseas.

Conclusions

Despite having adequate national aquaculture plans and policies, Malaysia is still far from achieving the target of 600,000 t of aquaculture production by 2010. Problems and issues impeding growth of this food production sector such as land issues, disease and food safety, finances, technology and labor issues and the lack of efficient marketing strategies are common to many developing countries with a growing aquaculture industry and these issues have been previously highlighted and discussed in detail (Ng 2009).

According to industry sources, there were only 13 active aquafeed mills in Malaysia in 2007 with a total aquafeed production of about 100,000 t. This level of feed production will not be able to support the anticipated expansion of the aquaculture industry in Malaysia. Projected commercial aquafeed requirements when the NAP3 aquaculture production targets are achieved is about 601,000 t (Table 1).

Nevertheless, these are indeed exciting though challenging times for the aquaculture industry in Malaysia. Malaysian government policies favoring the growth of this industry will go a long way in helping the country achieve her targets of both national food security and to increase foreign exchange earnings through seafood exports. In this era of higher consumer awareness of food safety and quality issues, it is clear that effective government institutions are crucial for the responsible development of the local aquaculture industry and to make Malaysian seafood products globally competitive. Investment opportunities abound for both local and international companies in all sectors of the aquaculture industry in Malaysia. In the not too distant future and with concerted efforts by both the government and private sector stakeholders, Malaysia may yet emerge as a major aquaculture producer in the world.

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Note

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References


