



Minireview

The role of crustacean fisheries and aquaculture in global food security: Past, present and future

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ABSTRACT

The 1996 World Food Summit defined food security as “Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life”.

This paper looks at the status of production from both shrimp capture fisheries and shrimp aquaculture, as well as trade, in order to understand the contribution of the crustacean sector to overall fish production and thus to global food security. This paper also examines some sustainability issues that will potentially affect the contribution of the crustacean sector (particularly shrimp) to food security. These include sustainable shrimp capture fisheries, sustainable shrimp trade and sustainable shrimp aquaculture.

The paper concludes that crustaceans are an important source of aquatic food protein. Production (as food and ornamental) and trade are extremely important for developing countries. It provides both economic development and empowerment in terms of contribution to GDP, consumption, employment, catch value and exports. The crustacean sector generates high value export products which enables producers to buy lower value products in the world market – thus a positive contribution to food security in both producing and exporting countries.

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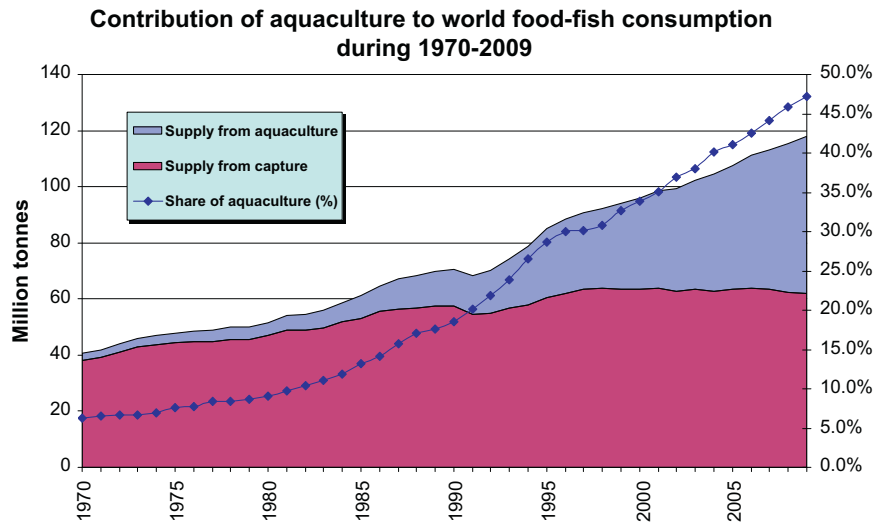


Fig. 1. Contribution of aquaculture to world food–fish consumption during 1970–2009.

1. Introduction

The World Food Summit (1996) defined food security as “Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life”.

This paper looks at the status of production from both shrimp capture fisheries and shrimp aquaculture, as well as trade, in order to understand the contribution of the crustacean sector to global food security. This paper also examines important sustainability issues that will potentially affect the contribution of the crustacean sector (particularly shrimp) to food security.

2. State of world fish production and utilization

The most recent statistics (FAO, 2011) reported that capture fisheries and aquaculture supplied the world with about 144.6 million tons of fish in 2009. Of this, 117.8 million tons were used as human food, providing an estimated apparent per capita supply of about 17.2 kg (see Fig. 1). In 2009, crustaceans (63.7% of shrimps and prawns from both freshwater and saltwater) contributed approximately 11.2 million tons to the global fisheries and aquaculture production. Nearly 5.9 million tons came from marine capture fisheries and 5.3 million tons originated from aquaculture. Production from aquaculture is mostly destined for human consumption. In 2009, aquaculture accounted for 47.3% of the world’s aquatic animal production for human consumption. In 2007, fish accounted for 15.7% of the global population’s intake of animal protein and 6.1% of all protein consumed. The fish sector is a source of income and livelihood for millions of people worldwide. Employment in fisheries and aquaculture has grown substantially in the last three decades, with an average rate of increase of 3.6% per year since 1980 and currently accounts for about 44.9 million people worldwide (FAO, 2010).

During the period 2000–2008, the State of World Fisheries and Aquaculture (SOFIA) 2010 (FAO, 2010) reported that aquaculture production of all major species groups continued to increase. Crustacean production grew at an average annual rate of almost 15% during this period faster than the previous decade, compared to the finfish and molluscan sectors whose production grew more slowly than the period 1990–2000 (Fig. 2). The rapid increase in crustacean production largely reflects the dramatic increase in white leg shrimp (*Penaeus vannamei*) culture in China, Thailand and Indonesia.

According to FAO (2011), in terms of catch trends by valuable marine species group, shrimp catches have slightly decreased in recent years after a record high level of 3.3 million tons was reached in 2003 but remained at close to 3.2 million tons in 2009. The world’s farmed crustaceans in 2009 came from brackish water (2.4 million tons, or 46%), freshwater (2.2 million tons or 40.9%) and marine water (0.7 million tons or 13.1%). Crustaceans farmed in freshwater include more than 0.5 million tons of the marine species white leg shrimp (*P. vannamei*) produced by China,

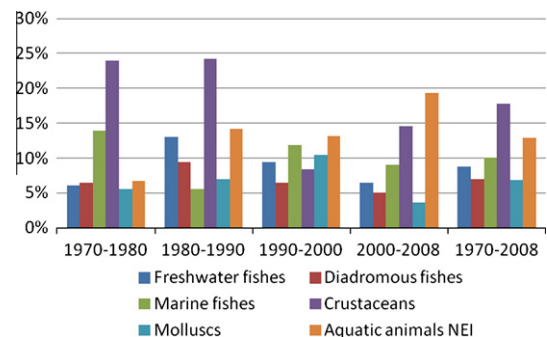


Fig. 2. Trends in world aquaculture production growth rate: average annual growth rate for major species groups: 1970–2008.

Table 1

Crustacean aquaculture production by species groups in 2008 and 2009 (FAO, 2011).

| | 2008 | | 2009 | |
|-------------------------------|----------------|-----------------|----------------|-----------------|
| | Quantity (Ton) | Value (USD'000) | Quantity (Ton) | Value (USD'000) |
| <i>Marine crustaceans</i> | | | | |
| Marine shrimp/prawns | 3,403,195 | 14,374,250 | 3,495,972 | 14,647,939 |
| Marine cabs | 240,789 | 747,938 | 246,523 | 767,408 |
| Other marine species | 1206 | 12,007 | 1511 | 14,328 |
| Sub-total | 3,645,190 | 15,134,195 | 3,744,006 | 15,429,675 |
| <i>Freshwater crustaceans</i> | | | | |
| Freshwater crab | 518,365 | 3,608,126 | 574,247 | 3,997,060 |
| Crayfishes and other species | 418,242 | 1,868,073 | 526,670 | 2,410,691 |
| Freshwater shrimp/prawns | 437,257 | 2,197,683 | 459,669 | 2,297,172 |
| Sub-total | 1,373,864 | 7,673,882 | 1,560,586 | 8,704,923 |

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