Is aquaculture at its turning point?

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The FAO study conducted in 2001 (SOFIA, 2002) reports that the world demand for fish and fishery products is projected to expand by almost 50 million tonnes, from 133 million tonnes in 1999/2001 to 183 million tonnes by 2015. On the supply side, total world fish production would increase from 129 million tonnes in 1999/2001 to 172 million tonnes by the year 2015. Of the total production, capture fisheries is projected to stagnate, while aquaculture production is projected to increase substantially, but at a slower rate than in the past. Of the expected increase of 43 million tonnes in global fish production from 1999/2001 to 2015, 73 percent would come from aquaculture, which will account for 39 percent of global fish production in 2015 (up from 27.5 percent in 1999/2001).

Global production from aquaculture has grown substantially, both in terms of quantity and its relative contribution to the world's supply of fish for human consumption. During the last 50 years, (Figure 1) from less than a million tonnes in the early 1950s, production reached 59.4 million tonnes, including 13.9 million tonnes of aquatic plants, by 2004, with a value of US$ 70.3 billion. This increasing trend is projected to continue in forthcoming decades. The sector aims to contribute more effectively to food security, poverty reduction and economic development by producing 83 million tonnes of aquatic food by 2030, an increase of 37.5 million tonnes over the 2004 level.

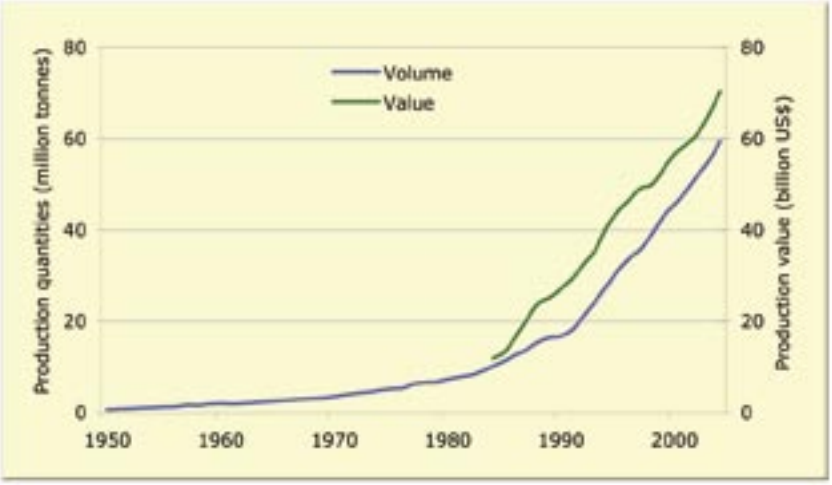
An article in the Economist (1995) - The World in 1996 - predicted that, *"Farmed fish will become a major source of protein and will meet 40 percent of the world demand for fish by 2010"*. More than half a decade ahead of the projections aquaculture already provides more than 40 percent of the global food fish supply.

Population growth, rising per capita incomes and growing consumer preference for fish products have led the world fish consumption to increase from 40.5 to 106 million tonnes over the period 1970 to 2004, a trend that is expected to continue onwards. With stagnant capture fisheries production, aquaculture expansion, as in the recent past, is expected to contribute significantly to meet this growing global demand for fish consumption.

AQUACULTURE AT ITS CROSSROAD

While taking giant strides in productivity, intensification, integration, industrialization, and diversification, the sector presents significant concerns on reducing environmental

Figure 1. Trend in total world aquaculture production and value (including plants), 1950-2004



degradation and competition for environmental goods and services. This calls for the sector to better serve the poor, and to be more sustainable, more responsible, more equitable, and more economical in its development.

The FAO study (SOFIA, 2002) also reported that the 10.9 million tonnes of deficit, arising from excess demand for fish and fishery products, will not materialize as the market will be re-equilibrated through two factors: relative price increases and shifts in demand among different types of fish and fish products, and change in demand towards alternative protein foods. According to the projections, prices for all types of fish would increase in real terms by 3.2 percent by the year 2015; this will have relatively severe effects on low-income consumers. As a consequence of the increase in price, world consumption of all types of fish would be 179 million tonnes, which is 3.8 million tonnes lower than the projected demand. On the other hand, the study pointed out that, world supply of all types of fish, stimulated by higher prices, would increase by 7.1 million tonnes by the year 2015. And in terms of world trade, developing countries as a whole would increase their net exports of fish and fishery products.

A recent global aquaculture review (FAO, 2006a) reported six general development trends:

- continuing intensification of aquaculture production in which the main driving forces are the availability of sites that is becoming increasingly limited and the ability to exploit non-agricultural land that is becoming restricted;
- continuing diversification of species use, particularly high value marine species in regions and countries where aquaculture is well established;
- continuing diversification of production systems and practices, including integration of aquaculture into existing farming systems and diversification of other sectors, particularly agriculture, into aquaculture;
- increasing influence of markets, trade and consumers, which is prompting producers and processors to pay more attention to food quality and safety and moving toward greater value adding and development of processed products for exports;
- enhancing regulation and improving governance of the sector, with strong emphasis being placed on increasing self-regulation by farmer associations and the sector in general; and
- increasing attention on better management of the aquaculture sector through production efficiency, economic sustainability and overall competitiveness.

The global review noted that the trends do not necessarily apply equally to all the regions due to intra- and inter-regional differences in the development stage of aquaculture.

A Prospective Analysis of Future Aquaculture Development, recently conducted by FAO (FAO, 2006b), endorses those trends, and provides a roadmap for the sector to achieve its vision by 2030, based on an analysis of factors which contributed to aquaculture growth, factors which hindered growth, and factors that could constrain growth in the future. The three factors were analysed based on three related themes: (a) policy, institutional, legal and management; (b) markets, trade and finance; and (c) research and development.

The Prospective Analysis also noted that, due to the marked intra- and inter-regional and country variations in the history, practice and potential of aquaculture, it is not logical to consider the analyses and conclusions of the factors to apply equally to all countries and regions engaged in aquaculture activities.

The results of the analysis mainly reflect the behaviour of the sector in the countries where aquaculture is well established, notably China and other Asian countries. In 2004, China accounted for 69.6 percent of the total global production, with the rest of Asia accounting for 21.9 percent. In contrast, Sub-Saharan Africa warrants special consideration due to the vast disparity in production, consumption and other related factors.

In 2004, Sub-Saharan Africa contributed less than 1 percent to global production. Fish consumption is the lowest in all regions and is the only part of the world where it is declining. However, the potential for growth is extremely high and Africa is now receiving greater attention by both national and international development agencies.

From an activity that has primarily Asian origin (e.g., culture of common carp as early as 1100 BC in China; oyster farming recorded as early as the Han Dynasty in 206 BC to 220 AD), aquaculture has now spread to all the continents. From an activity that was focused on freshwater fish, particularly the cyprinids, it now encompasses all the aquatic environments and many aquatic species. From an activity

that was primarily small-scale or non-commercial and family-based, it now includes large-scale commercial or industrial production of high value species that are traded at the national, regional and international levels. Asia's dominance, the cyprinid-focused culture practices and the persistent small-scale based aquaculture operations are still evident in the present structure of the sector.

Many governments have now clearly recognized that aquaculture programs need to be implemented based on sound policies in order to explore the following opportunities for further developing the sector such as:

- growing population and increasing purchasing power of people;
- opening of new markets facilitated by trade liberalization; and
- advances in biotechnology and marine engineering

Major challenges include:

- strengthening capacities of institutions and other stakeholders;
- supplying the increasing consumer demand for diversified, safe and quality products;
- the efficient use of scarce land and water resources; and
- the need to support small-scale farmers.

The sector's performance, based on past trends, indicate that it stands ready to meet new challenges, but will need sustained commitment and support by government policy makers and international development partners involved in aquaculture development from ''drivers'', those who initiate and lead the process, "champions", those who supports the process and "change agents", those who take the risks and accepts the challenges, within the sector to promote its cause more effectively.

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Photo left: Large-scale shrimp farming in Belize with hatchery, grow-out and processing facilities

Right: Small scale tilapia farming in Belize

Bottom: State-operated salmon hatchery in Latvia