

# Contributions of Aquaculture Industry to Food Security and Poverty Alleviation

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Aquatic animal is an important food source for the world population. Traditionally, aquatic animal primarily came from capture fisheries. Capture fisheries contributed over 90% of the total aquatic animal production globally before the 1980s. Increasing demand for fish products and stagnant production from capture fisheries has greatly stimulated development of aquaculture industry since the late 1970s. Aquaculture industry has been the steadiest and fastest growing food production industry in the world. While making increasing contribution to the world food security, aquaculture industry is also making significant contribution to poverty alleviation and rural economic development in developing countries.

World aquaculture production has grown at an average annual rate of 8.18% during 1987-2007. As the result, the total world aquaculture production reached 65.19 million tonnes in 2007, which accounted for 41.69% of the total world production of aquatic products in the year. Capture fisheries and aquaculture supplied the world with about 110 million tonnes of food fish in 2006, providing an apparent per capita supply of 16.7 kg (live weight equivalent), which is among the highest on record. Of this total, aquaculture accounted for 47 percent.

The steady and fast growth of aquaculture production has effectively offset the effects of stagnant capture fishery production and a rising population and contributed to a modest growth rate of about 0.5 percent per year since 1992 in per capita supply outside China. The share of fish proteins in total world animal protein supplies reached a peak of 16.0 percent in 1996 and slightly declined to about 15.3 percent in 2005. Notwithstanding the relatively low fish consumption by weight in low-income and food-deficit countries (LIFDCs) of 13.8 kg per capita in 2005, the contribution of fish to total animal protein intake was significant – at 18.5 percent.

Contribution of aquaculture industry to food security is often poorly recognized due to the wrong interpretation to the structure and production pattern of the sector. Many people use to relate aquaculture with salmonids and shrimp farming operated at large commercial scales and oriented for international market. In fact, current global industry are largely composed of small-farmers who produce species like mollusks, seaweeds, carps, tilapia and other species at cheap cost and low valued feed ingredients, fertilizer or entirely natural food. These species groups



contribute over 75% of the world aquaculture production. Globally, internationally traded fish products only account for about 20% of the total production. China, the world largest aquaculture producer expects less than 10% of the production. This fully demonstrates the importance of aquaculture to the national food security.

While contributing to the world food security, aquaculture industry is also making significant contribution to poverty alleviation and rural development in developing countries. According to FAO statistics, the value of world aquaculture products reached US\$94.56 billion in 2007. According to FAO publication, number of aquaculture farmers around the world was about 8,663,000 in 2006. Comparing the total number of fishers in the world, which was 34,839,084 and the aquaculture production, the number of aquaculture farmers seemed under-estimated considerably. For instance, people directly or indirectly involved in aquaculture activities reached 750,000 in Nepal in 2006. Contribution of aquaculture industry is not limited to provision of job opportunities to rural population. It also provides a new livelihood of higher income other than other agriculture activities in many countries. For example, economic return from pond fish culture is usually 4-6 times of the return to the same area of crops in China, which significantly contributes to poverty alleviation.

While recognizing the overall contribution of aquaculture industry to food security and poverty alleviation globally, it is also important to realize the imbalanced development and contribution of the industry. Currently, over 90% of world aquaculture production comes from Asia. Huge difference also exists within the continent. Compared with the average supply of fish products of 17.9 kg per capita in Asia, per capita consumption of fish products in Nepal was 1.753 kg only in 2006. The average supply of fish products in LIFDCs was 8.3 kg per capita. The great variation in the contribution of aquaculture industry implies huge potential for the industry to make larger contribution.

In the new millennium, the world is facing a number of major challenges. Population increase is one of them. The world population is expected to reach 9.3 billion by 2050 from 6.6 billion in 2007. This is going to make the tasks of ensuring world food security and poverty alleviation much more difficult. Aquaculture industry is expected to contribute more than ever. Just to maintain the level of per capita supply of aquatic food supply of 13.6 kg per year in 2006, the world fish production needs be increased by 36.72 million tonnes. With the present trend of capture fisheries production and related population stock, this increased demand for fish products can only be met by the development of aquaculture industry. In other words, the world aquaculture production needs to be increased by nearly 90% from the level of 2006. This will be a great challenge to aquaculture sector. Availability of and competition for natural resources particularly land and water surface is going to be the most serious constraint. It might significantly restrain the space for aquaculture development. Environmental and climate change is another major challenge which may hamper aquaculture sector to contribute more to world food security and poverty alleviation. More and more stringent standard on aquaculture food quality and safety might block the access of small farm holders to the major market or even drive them out of the business, which could significantly undermine the contribution of aquaculture industry to poverty alleviation. The contribution of aquaculture industry in the future will depend on how the constraints can be effectively overcome through technological development and good governance e.g. implementation of ecosystem approach to aquaculture, which will not only improve the efficiency but also ensure the long term sustainability of the industry.