



## Review on Overfishing of Wild Fishes and Use of Fishmeal

### KEYWORDS

Overfishing, fishmeal

### Kausik Mondal

Assistant Professor, Department of Zoology, Sidho-Kanho-Birsha University, Purulia-723101, India

**ABSTRACT** *Aquaculture in India is predominantly a rural activity. Due to growing scarcity of arable land for food production, fish farming through aquaculture has gained importance as a priority production system. Main source of fishmeal is coming from different wild fishes of fresh and marine water bodies. Fishmeal is the most important protein source but due to overfishing many wild fishes become extinct. Alternatives sources of this high quality fishmeal may save the wild fishes.*

### Introduction

Fish species generally require higher levels of dietary protein for optimum growth than poultry or cattle (Tacon and Cowey 1985). Aquaculture production in the developing country is expected to increase quantitatively using better fish culture techniques, the major challenge will be how to ensure long term sustainable development. From a nutritional perspective, the key factor influencing productivity are diets supplying essential nutrients energy. In the industry of fish feed production, the raw materials which determine the effectiveness of fish diet composition at a financial and quality level, are those derived from the marine environment, the most vital being fishmeal and fish oil. Fishmeal is the most preferred protein source due to its high protein content, good amino acid balance, lack of antinutrients and high palatability (Anastasiou and Nengas 2005). Fishmeal and fish oil production from fishing activities has stabilized at present, whereas the significant increase in demand is the result of the tremendous growth of aquaculture worldwide (Anastasiou and Nengas 2005). Now, the number of alternative feedstuffs with high protein content that can currently be used to replace fishmeals. These alternative feedstuffs will protect overexploitation of fish.

### Fish production and consumption

Global capture of fish for food jumped from 44 million tons in 1973 to 65 million tons in 1997. By the late 1980s, however, the stocks fished by many wild-fishing operations were fully exploited and even overexploited. Aquaculture now represents more than 30 percent of total food fish production, and Asia accounts for 87 percent of global aquaculture production by weight. In 1973 the developed world was a net exporter of 818,000 tons of food fish, but by 1997 these countries were net importers of 4,045,000 tons of food fish. By the late 1990s more than 50 percent of fish exports came from developing countries (Delgado et al. 2003).

Global consumption of fish has doubled since 1973. Nearly one-third of the world's wild-caught fish are "reduced" to fishmeal and fish oil, which are then used in feeds for livestock like poultry and pigs and in feeds for farmed carnivorous fish. The growth in production, like that in consumption, comes almost entirely from developing countries, which now produce nearly three times as much fish as developed countries (Delgado et al. 2003).

### Fishmeal production

Total fishmeal production is around 6.5 million tons per year, of which aquaculture is using 2 million tons (31%). Total fish oil production is between 1 and 1.2 million tons and aquaculture uses 40% of this should further expansion of aqua-

culture raise demand for fishmeal and fish oil, it is far more likely that this will be achieved through a shift of markets. Worldwide fishing is stable at around 95 million tons per year, of which approximately one third is used for fishmeal and fish oil (Aquamedia 2002). This is supplemented by the trimmings from the processing of wild fish caught for human consumption. At present, the remaining two-thirds of the fishmeal produced are used in feed for land animals. An increase in amounts of fishmeal used for fish feed is far more likely to come through a reduction in the amount used for pig and poultry feed, rather than an increase in either the pelagic fish catch or an increase in the proportion of the total catch used for these products.

### Fisheries and environment

Healthy natural aquatic environment is essential to maintaining fish harvest levels. Most environmental damage occurred due to overfishing of wild fish. Over investment in fishing and the resulting overcapacity have led to excessive exploitation of fish stocks, especially by developed-country fleets. During the 1970s and 1980s fleet size increased twice as fast as fish harvests. Moreover, wild-fishing operations capture, kill, and discard a massive quantity of bycatch-fish that are the wrong size, the wrong species, or otherwise undesirable. Global discarded bycatch of fish and other marine organisms is currently estimated at more than 20 million tons a year, nearly one-quarter of the world fish catch (Delgado et al. 2003). Fishing itself can also harm ecosystems by removing massive quantities of a species and leading to wholesale changes in the food web dynamics of those systems. Effluent from aquaculture ponds and pens, like fertilizer, undigested feed, and biological waste, is often released directly into surrounding waterways. And rapidly increasing demand for fishmeal and fish oil may place pressure on the wild stocks from which these products are derived.

There have been suggestions recently that some species are overfished. While the FAO report *The State of World Fisheries and Aquaculture (2002)* concludes that only 18 percent of stocks or species groups are reported as overexploited (FAO 2005). The species classified as overfished tend to be long-lived, slow-growing fish that are less able to support high exploitation rates than the faster-growing, short-lived species predominantly used for fish oil and fishmeal

Considerable investment is being made in research to find alternatives to these high quality fishmeals and oils. We now know that refined vegetable protein sources can be used, and that they are as good for the health, growth and quality of fish as any other protein. An extra demand for oils is most likely to be met through the addition of vegetable oils.

**REFERENCE** Anastasiou, S. and Nengas, I. 2005. A general review on the use of alternative protein sources in diets for Mediterranean fish. In Mentero, D; Basureo, B; Nengas I, Alex M, Izquierdo M (eds), Mediterranean fish nutrition, Zaragoza, CIHEAM-IAMZ, pp. 121-126. | Aquamedia 2002. Where does the fish meal and fish oil for feeds come from? [www.feap.info/home/FAQ/Answers/ans7\\_en.asp](http://www.feap.info/home/FAQ/Answers/ans7_en.asp). | Delgado C. L., Wada N., Rosegrant M. W., Meijer S. and Ahmed M. 2003. The Future of Fish , Issues and Trends. International Food Policy Research Institute and WorldFish Center. Pp.-1-5. | FAO-Fisheries and Aquaculture Department. 2005. Depleted stocks recovery: a challenging necessity Rome. Updated 27 May 2005. [Cited 3 January 2012]. <http://www.fao.org/fishery/topic/14767/en>. | Tacon, A.G.J. and Cowey, C.B. 1985. Protein and amino acid requirements, p. 155-183. In: P. Tytler and P. Calow (eds.). Fish energetics: new perspectives. Croom Helm, Beckenham, U.K.