

Gazing at the Crystal Ball: Fish to 2020

The book "Fish to 2020: Supply and Demand in Changing Global Markets" projects likely changes in fisheries over the next two decades, using a global model of supply and demand for food. The book grew out of a 1997 conference in Denmark to define key policy research issues concerning fisheries in developing countries. The book addresses a number of key policy issues such as: Will growth patterns continue for fish demand in the North and South? Where will supply come from? What will happen to trade and fish prices? What are the implications for sustainable use of the oceans and coastal areas? Can aquaculture alleviate the pressure on capture fisheries? What are the implications for the poor? What are the entry points for making the 'Blue Revolution' most favourable to the poor?

The International Food Policy Research Institute (IFPRI) and the Worldfish Center (formerly ICLARM) were the main players behind the conference and the book. Here are some excerpts from the book brought out by Worldfish Center. The book has been authored by Christopher L Delgado, Nikolas Wada, Mark W Rosegrant, Siet Meijer and Mahfuzuddin Ahmed.



The seemingly inexhaustible oceans have proved to be finite after all. Landings of wild fish have levelled off since the mid-1980s, and many stocks are fished so heavily that their future is threatened. And yet the world's appetite for fish has continued to increase. Aquaculture has arrived to meet this increasing demand. Production of fish from aquaculture has exploded in the past 20 years and continues to expand round the world.

But will aquaculture be sufficient to provide affordable fish to the world over the next 20 years? And what environmental and poverty problems will aquaculture face as it expands? Using IFPRI'S International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT), this report projects the likely changes in the fisheries sector over the next two decades, given present trends. Fish prices are expected to rise, reflecting a demand for fish that outpaces the ability of the world to supply it.

The model shows that developing countries will consume and produce



a much greater share of the world's fish in the future, and trade in fish commodities will also increase. As aquaculture expands, especially in developing countries, environmental concerns such as effluent pollution, escaped farmed fish, land conversion, and pressure on stocks from fishmeal demand will only increase with time, unless technologies and policies promote sustainable intensification. And small poor producers are at risk of being excluded from rapidly growing export markets unless ways can be found to facilitate affordable certification of food safety and environmentally sound production.

Recent trends in fish supply and demand

Since the early 1970s, production, consumption and long-distance

trade of fish have risen dramatically, almost entirely because of changes taking place in developing countries. The primary driver of most of these changes has been the increased consumption of fish in developing countries. As population in these countries has grown and consumers have become richer, the resulting increased demand for fish has altered markets for seafood around the world.

China dominates aggregate consumption of fish products. It accounted for about 36 percent of global consumption in 1997, compared with only 11 percent in 1973. India and Southeast Asia together accounted for another 17 percent in 1997, with total consumption doubling since 1973. Total consumption levels have declined in the developed countries since the mid-1980s, mainly as a result of dramatically lower per capita consumption in the former Eastern Bloc countries.

The changing profile of fish consumption around the world comes as no surprise, partly because countries with rapid population

growth, rapid income growth and urbanization tend to have the greatest increases in consumption of animal products including fish products.

The shift of wild fish production to developing countries: During the 1970s and 1980s, exploitation of wild fish stocks soared, thanks to expanded fishing fleets, new fishing technologies and increased investments in the fishing sector. 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 over-exploited. Since then, despite increases in investment and fishing capacity, fish production from wild fisheries has slowed or stagnated.

Developing countries now account for more than 70 percent of the total production of fish for food, including both wild fisheries and aquaculture. By 1997, developing countries were producing twice as much as developed countries. Developing countries have also gone from being net importers of fisheries products to large net exporters over the past 30 years. Part of this shift is due to the establishment of 200-mile Exclusive Economic Zones (EEZs) within which coastal nations can claim exclusive fishing rights, excluding some developed-country fleets and forcing others to strike deals in order to gain fishing access. In some cases, creation of these zones led to the reclassification of fish production from developed to developing countries, as vessels merely changed flags. Meanwhile, developing countries were expanding their own fishing fleets as developed countries were contracting theirs.

One of the most striking trends in the capture of fish for food has been China's emergence as the largest producer and the simultaneous decline of Japan's production. In 1973, Japan was the world's largest producer of wild food fish, accounting for 18 percent of global production. By 1997 its share had

Crisis in developed countries!

In recent decades, capture fisheries in developed countries have entered into a crisis. Global capture fisheries production for human consumption grew through the late 1980s, largely driven by technological improvements that increased capacity, but it has stalled since then. In fact, food fish production from capture fisheries is lower in developed countries than it was 30 years ago, and has declined steadily since the late 1980s. Although some of this decline is attributable to the establishment of 200-mile exclusive economic zones and the resulting reduced fishing access for some developed countries like Japan, overfished and declining stocks are also responsible.

plummeted to 7 percent, and its absolute level of production had dropped by nearly half. Enforcement of EEZs significantly reduced the fishery resources available to Japan, and dwindling stocks of fish such as pilchards further reduced Japanese catches. Meanwhile China increased its

output from 9 percent to 21 percent, boosting production from under 4 million tons to 14 million tons. One study concluded that Chinese fishery production – including aquaculture – was overestimated by 43 percent in 1995, and suggested that institutional incentives that reward or punish local officials

Tuna landings at the Malè fishing market.



based on reported productivity may be largely responsible for the increasing distortion. If China has indeed over-reported its fish production, trends in global fish production appear much less favourable to the health of stocks than they otherwise do.

The rising share of aquaculture

With wild fish production stagnating, growth in overall fish production has come almost entirely from the global boom in aquaculture, especially in developing countries. Aquaculture now represents more than 30 percent of total food fish production, up from just 7 percent in 1973. From 1983 to 1997, developing-country production of fish from aquaculture grew at an annual rate of 13.3 percent, whereas production in developed countries grew at a rate of 2.7 percent. Asia accounts for 87 percent of global aquaculture production by weight, and China alone commands a stunning 68 percent share, rising from 32 percent in 1973.

Projections

Global food fish production is projected to total 130 million metric tons in 2020, equivalent to an annual rate of increase of 1.5 percent from 1997 onward (see Table). Of the 37 mmt increase in global food fish production, over two-thirds comes from aquaculture, which is projected to represent 41 percent of global food fish production in 2020 (up from 31 percent in 1997).

The crucial role of technology in the outlook for fisheries

With global fish supply struggling to keep pace with demand over the next 20 years, technology will play a crucial role in determining the prices of food fish both to the poor and to developed-country consumers. In capture fisheries, information technology and waste reduction will be useful in stabilizing production; more intense exploitation is unlikely to yield significant growth on a global scale. Aquaculture has much greater potential for growth, and requires a broader array of technologies not

Total production of food fish, 1997 and 2020							
	Actual 1997		Projected 2020		Projected annual growth rates 1997-2020 (percent)		
	Million metric tons	Share from aquaculture (percent)	Million metric tons	Share from aquaculture (percent)	Capture	Aqua culture	Total
China	33.3	58	53.1	66	1.1	2.6	2.0
Southeast Asia	12.6	18	17.5	29	0.8	3.6	1.4
India	4.8	40	8.0	55	1.0	3.7	2.3
Other South Asia	2.1	23	3.0	39	0.6	4.0	1.7
Latin America	6.4	10	8.8	16	1.1	3.5	1.4
West Asia and North Africa	2.2	9	2.8	16	0.6	3.6	0.9
Sub-Saharan Africa	3.7	1	6.0	2	2.0	5.8	2.1
United States	4.4	10	4.9	16	0.1	2.7	0.5
Japan	5.2	15	5.2	20	-0.3	1.2	0.0
European Union ¹⁵	5.9	21	6.7	29	0.0	2.1	0.5
Eastern Europe & former Soviet Union	4.9	4	5.0	4	0.1	0.4	0.1
Other developed countries	4.8	12	5.8	20	0.5	2.9	0.8
Developing World	68.0	37	102.5	47	1.0	2.8	1.8
Developing world excluding China	34.6	17	49.4	27	1.0	3.6	1.6
Developed World	25.2	13	27.6	19	0.1	2.1	0.4
World	93.2	31	130.1	41	0.7	2.8	1.5

Source: Actual data were calculated by authors from FAO 2002a; Projections for 2020 are from the baseline scenario of IFPRI'S IMPACT model (July 2002).

Notes: Actual data are three-years averages centered on 1997. Projected growth rates are exponential, compounded annually using three-year averages as endpoints.

only to increase productivity but also to deal with the attendant problems of intensification. In high-value aquaculture, the possible limiting constraints of fishmeal and fish oil can only be surmounted through feed replacements, and this need will become more important both for aquaculture and the health of fish stocks as aquaculture's demand for fishmeal and fish oil increase.

The introduction of new species and new traits into ecosystems, however, must be regulated and monitored with great caution. As global aquaculture intensifies, technology's role in controlling externalities and minimizing net resource demands will become even more important.



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- Editor