



Fisheries, food security, and the poor

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Fish is an important component in the human diet, but its production is not likely to keep up with demand. In assessing the consequences of the decreasing fish supply for human food security, it is important to distinguish between effects on the population as a whole and effects on the poor, those most vulnerable to malnutrition. Middle and high income people consume much more fish than low income people. However, even though they consume less, many low income people depend on fish as a major source of animal protein. Decreasing fish supplies will be felt in the form of higher prices and in the reduced availability of diverse forms of fish products. Given the fact that they also have access to many other kinds of foods, for people with middle and high incomes the decline in fish supply may be felt as little more than an inconvenience. For low-income people with fish-dependent diets, however, the reduction in fish supply may have serious consequences in terms of both economics and nutrition. © 1998 Elsevier Science Ltd. All rights reserved

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Introduction

Fisheries make a major contribution to the human food supply. To strengthen that contribution, in 1984 the Food and Agriculture Organization of the United Nations (FAO) launched an action programme on “The Promotion of Fish in the Campaign Against Malnutrition” (FAO, 1984; Kent, 1987). In December 1995, at an International Conference on the Sustainable Contribution of Fisheries to Food Supply held in Kyoto, Japan, the 95 participating states approved a Declaration and Plan of Action to enhance the contribution of fisheries to the human food supply.

Food security is defined as “secure access to enough food at all times” (Maxwell and Frankenberger, 1992). In some efforts to enhance the contribution of fisheries to food security (as at Kyoto) the needs of the poor are mentioned, but there is little systematic attention to the differences and linkages between food security for the population as a whole and food security for the poor, those most vulnerable to malnutrition. In working to strengthen food security, whether in fisheries or in other sectors, it is important to draw a clear distinction between the two.

Overall fish food supplies

As indicated in Table 1, the total production of fish worldwide, marine and inland, catch and culture, reached 100 million metric tons in 1989. It was lower than that for several years

Table 1 Global trends in fish supplies

| Year | Total world catch (000s metric tons) | Share of total catch for human consumption (%) | Share of total world catch in international trade (%) |
|------|---|---|--|
| 1983 | 77,497 | 71.0 | 32.27 |
| 1984 | 83,932 | 68.9 | 32.77 |
| 1985 | 86,378 | 69.1 | 35.58 |
| 1986 | 92,845 | 68.5 | 35.49 |
| 1987 | 94,402 | 70.2 | 35.99 |
| 1988 | 99,085 | 70.0 | 35.46 |
| 1989 | 100,311 | 70.3 | 37.87 |
| 1990 | 97,556 | 71.6 | 37.37 |
| 1991 | 97,052 | 71.0 | 38.71 |
| 1992 | 98,113 | 72.8 | 38.47 |

Source: Food and Agriculture Organization of the United Nations, *Yearbook of Fisheries Statistics: Commodities*, Vol. 75, Rome (FAO, 1994), Tables A-1 and A-3.

thereafter, prompting speculation about the collapse of the world's fisheries. However, total fisheries production reached a new record of 101.4 million metric tons in 1993, and in 1994 it reached 109.6 million metric tons, another new record. Preliminary figures for 1995 indicated a new peak total production of 112.3 million tons. Given the increasing importance of mariculture and other aquaculture, there is no evident limit to total production.

More than a third of the total world catch goes into international trade, a figure that has risen to almost 40% in recent years. Approximately 70% of the total is for direct human consumption, whereas the rest is used for various purposes, primarily animal feed, fertilizer, and oils.

Some fisheries have declined sharply or collapsed altogether in recent years, a phenomenon that is not visible in the grand totals because other fisheries have opened or expanded. There has been widespread overfishing in coastal and shelf areas, and also on the high seas. Fisheries are endangered not only by overfishing but also by pollution and other environmental stresses in spawning and feeding areas along the coasts. Mangrove forests are being destroyed, and coral reefs are being mined or enveloped by sediment deposits. Overall marine production has been declining slightly, but there has been compensation in the rapid increase of inland production and aquaculture. Some of the deterioration is in quality rather than quantity, and shows up more in declining prices than in declining volumes. Excess fishing capacity, mainly in the form of large-scale vessels, has produced enormous pressure on the world's fish stocks, resulting in commercial extinction in many cases. Coastal fisheries are also being overfished because many national governments are not adequately controlling access to these resources.

Fish food supplies to any nation or region are estimated on the basis of the production of fish for food purposes (as distinguished from production for animal feed, fertilizer, or oils) from all sources (inland or marine), plus imports minus exports. Averages for 1988–90 are shown in Table 2. On a per caput basis, people in developing nations have average supplies of about 9.3 kg per year, compared with 25.8 kg—almost three times as much—for people in developed nations. In 1984–86, the per caput supply in developed countries was more than three times that in developing countries (25.3 vs 8.1 kg), which suggests a trend towards more equitable distribution between developed and developing countries (FAO, 1988).¹

¹The 1984–86 figures are from Food and Agriculture Organization of the United Nations, *Yearbook of Fishery Statistics: Commodities*, Vol. 67 (Rome: FAO, 1988), pp. 303–306.

Table 2 Regional fish food supplies (average 1988–1990)

| Region | Catch (000s metric tons) | Fish food supply (000s metric tons) | Fish food per caput (kg/caput/yr) |
|----------------------|-----------------------------|--|--------------------------------------|
| World | 98,952 | 68,994 | 13.3 |
| Developed countries | 43,681 | 32,136 | 25.8 |
| Developing countries | 55,271 | 36,858 | 9.3 |
| European community | 7236 | 7776 | 22.7 |
| East Africa | 1146 | 1140 | 6.0 |
| Central America | 1631 | 988 | 8.9 |
| South Asia | 5094 | 4365 | 4.0 |

Source: Food and Agriculture Organization of the United Nations, *Yearbook of Fisheries Statistics: Commodities*, Vol. 75, Rome (FAO, 1994), Table 1.

Where overall supplies dwindle and prices increase, the food security of people in general will be threatened. This is already evident in nations such as India and the Philippines, in which middle class people feel they can no longer afford to eat fish as part of their regular diets. These nations may foreshadow what will become a serious global problem.

The overall supply of fisheries products may continue to grow at a modest rate over the coming years. However, with continuing growth in the world's population and growth in disposable incomes, production is not likely to keep up with demand (FAO, 1993a; Williams, 1996). So long as demand outruns supply, prices will go up. Moreover, increasing prices means increasing pressure on the resources. In many places the environment will be pushed to or beyond its limits of sustainable production.² Future supplies will be put at risk. It has long been recognized that growth in the supply of fish is not likely to keep up with the growth in demand (Robinson, 1982).

Fish food supplies for the poor

Although people in developed nations consume more fish than those in developing nations, they consume more of everything, so they cannot be said to depend on that fish. The importance of fish in the diet can be estimated by the extent to which it accounts for the animal protein intake. Table 3 indicates the contribution of fish in the diet for several nations, ranked in terms of the contribution of fish to the animal protein supply. The range is great, from the Maldives, where fish provides more than 96% of the animal protein, to inland nations such as Afghanistan, where fish is of negligible importance. Many of those most dependent on fish in the diet are small island nations, but many large nations are also highly dependent on fish.

As these data show, people in developing nations tend to be more dependent on fish in the diet than people in developed nations. The only developed nation for which fish provides more than 25% of the animal protein supply is Japan. Fig. 1 shows the association between average income levels, measured as gross domestic product per caput, and dependency on fish, measured as the degree to which fish constitutes a share of the animal protein supply (FAO, 1993c;

²At times decreasing prices lead to increased pressure on the resources, as people fish harder to meet their minimum income needs. This occurs where people have few options.

Table 3 National fish food supplies, 1990

| Country | Fish food supply per caput (kg/yr) | Fish proteins (g/caput/day) | Animal proteins (g/caput/day) | Fish as share of animal proteins (%) |
|--------------------|------------------------------------|-----------------------------|-------------------------------|--------------------------------------|
| Maldives | 133.6 | 43.9 | 45.6 | 96.2 |
| Solomon Islands | 61.0 | 19.3 | 24.3 | 79.4 |
| Korea, Dem P.R. | 44.9 | 12.7 | 19.4 | 65.3 |
| Tuvalu | 42.5 | 12.5 | 19.4 | 64.2 |
| Ghana | 27.1 | 9.3 | 14.6 | 63.9 |
| Indonesia | 14.7 | 5.8 | 9.1 | 63.1 |
| Philippines | 35.5 | 13.0 | 23.2 | 55.9 |
| Sri Lanka | 14.2 | 4.9 | 9.1 | 54.0 |
| Korea, Republic of | 47.7 | 12.9 | 25.4 | 50.8 |
| Japan | 71.2 | 26.3 | 52.4 | 50.2 |
| Bangladesh | 7.2 | 2.1 | 4.5 | 47.4 |
| Malawi | 8.4 | 2.5 | 5.2 | 47.1 |
| Fiji | 49.2 | 13.1 | 30.9 | 42.5 |
| Thailand | 19.9 | 5.8 | 15.2 | 38.0 |
| Tanzania | 14.5 | 4.2 | 11.2 | 37.6 |
| Nigeria | 8.4 | 2.2 | 6.6 | 33.1 |
| Vietnam | 11.8 | 3.3 | 10.1 | 32.1 |
| Norway | 39.1 | 13.5 | 58.7 | 22.9 |
| China | 9.8 | 2.6 | 13.5 | 19.4 |
| Spain | 38.2 | 10.4 | 60.2 | 17.3 |
| Haiti | 4.2 | 1.3 | 8.5 | 15.3 |
| India | 3.9 | 1.1 | 8.9 | 12.4 |
| Italy | 20.6 | 6.0 | 56.8 | 10.6 |
| Namibia | 12.3 | 2.9 | 28.1 | 10.2 |
| United Kingdom | 20.7 | 5.3 | 53.8 | 9.9 |
| Israel | 20.9 | 4.9 | 52.5 | 9.4 |
| United States | 21.5 | 4.7 | 70.8 | 6.6 |
| Australia | 19.0 | 4.6 | 71.4 | 6.4 |
| Guatemala | 0.8 | 0.2 | 7.6 | 3.0 |
| Hungary | 4.1 | 1.2 | 53.4 | 2.2 |
| Nicaragua | 0.4 | 0.1 | 12.5 | 0.9 |
| Afghanistan | 0.1 | 0 | 10.1 | 0.3 |
| Swaziland | 0.1 | 0 | 18.1 | 0.2 |

Source: Food and Agriculture Organization of the United Nations, *Fish and Fishery Products—Food Balance Sheets*, Rome (FAO, 1993c).

UNDP, 1993).³ It is clear that whereas poor people are not the biggest consumers of fish, they are most dependent on it.

With so many poor people highly dependent on fish, it is a matter of serious concern when their per caput supply decreases over time. In the decade from 1978–80 to 1988–90, fish food supply per caput increased by 27.7% in North and Central America, and by approximately 23% in Europe and Asia. In Africa, however, the per caput supply decreased by 2.9%, and in South America it decreased by 7.9%. There were decreases in per caput supply of more than 25% in Benin, Burundi, Libya, Mali, Niger, Nigeria, Sierra Leone, Sudan, Iraq, Malaysia, Syria, Yemen, Costa Rica, Dominica, the Dominican Republic, Guatemala, Nicaragua, Saint Lucia, Trinidad and Tobago, Bolivia, Colombia, Surinam, Uruguay, and Vanuatu (WRI, 1994).

Between 1961 and 1990 the fish food supply per caput declined steadily in Bangladesh,

³Figure 1 is based on data in Food and Agriculture Organization of the United Nations, *Fish and Fishery Products—Food Balance Sheets* (Rome: FAO, 1993c). Data on gross domestic product per caput were obtained from United Nations Development Program, *Human Development Report 1993* (New York: UNDP, 1993), pp. 135–137.

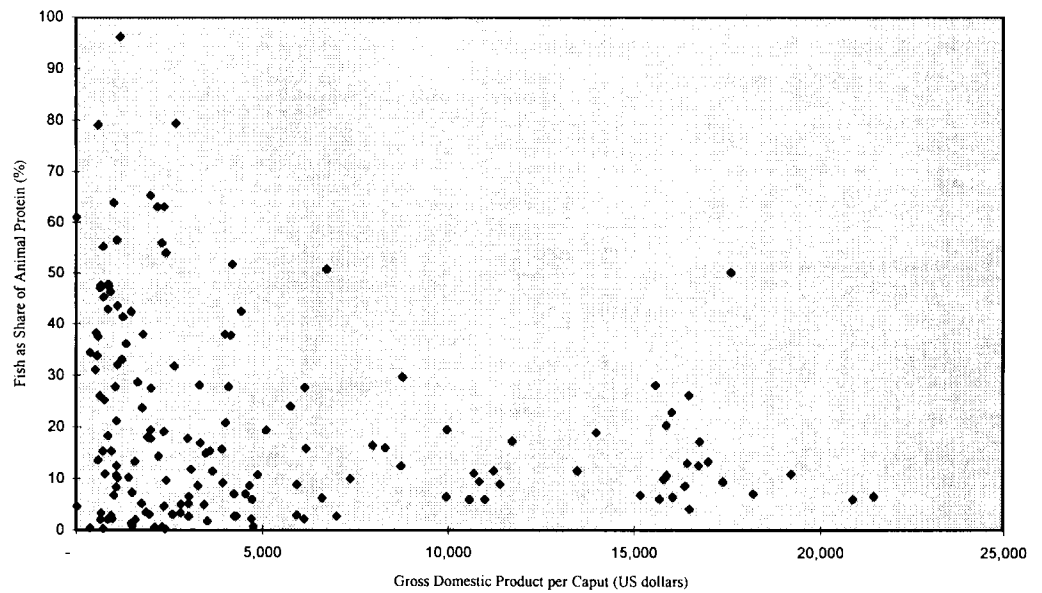


Figure 1 Dependence on fish vs income level.

Jamaica, Laos, Lebanon, Mauritania, Surinam, and Zambia. Table 4 shows the data for Bangladesh. Fig. 2, based on data in Table 4, shows that the overall animal protein supply per caput has been falling together with the fish supply, which means that fish has not been replaced with other forms of animal protein.

Any weakening of the world's fish supplies will be important for fish consumers generally, but special attention should be given to the needs of poor consumers. Changes in overall fish food supplies affect consumers unevenly. When supplies increase, most of the benefit is likely to go to those who are well off. Supply increases may or may not benefit the poor, depending on the particular local circumstances. However, when fish food supplies decrease, harm to the poor, in terms of deteriorating quantities and qualities and increasing prices, is virtually inevitable.

The FAO has acknowledged that:

Demand for fish can be expected to increase in developing countries, largely due to population increases, but this will compete with increasing demand in the developed world where income effects are likely to play an important role. If demand continues to grow faster than supply, the gap will be closed by price effects which will disadvantage those with a lower purchasing power.

However, the FAO's response to this fundamental problem was limited:

The means of reducing the impact of these constraints lies in the potential of increasing supply, mainly in three areas: (i) aquaculture; (ii) improved utilization; (iii) improved management of wild resources (FAO, 1993a).

If the response is simply to increase production, the fishing effort will naturally gravitate toward the most profitable products. Consider that

At the daily tuna auction in Tokyo it is not unusual to see a single giant bluefin tuna sell for \$30,000. A few years ago, one giant sold for \$83,500.... Only a tiny percentage of the Japanese

Table 4 Fish supplies in Bangladesh

| Year | Total fish production (metric tons) | Imports (metric tons) | Exports (metric tons) | Fish food supply (metric tons) | Population (000s) | Fish Supply per caput (kg/year) | Fish proteins (g/caput/day) | Animal proteins (g/caput/day) | Fish/animal proteins (%) |
|------|-------------------------------------|-----------------------|-----------------------|--------------------------------|-------------------|---------------------------------|-----------------------------|-------------------------------|--------------------------|
| 1961 | 777,200 | 0 | 16,000 | 761,200 | 52,724 | 14.4 | 4.3 | 7.1 | 60.3 |
| 1962 | 789,800 | 0 | 27,505 | 762,295 | 54,053 | 14.1 | 4.2 | 7.1 | 59.3 |
| 1963 | 790,500 | 0 | 27,497 | 763,003 | 55,417 | 13.8 | 4.1 | 7.1 | 57.8 |
| 1964 | 822,500 | 0 | 23,199 | 799,301 | 56,832 | 14.1 | 4.2 | 7.3 | 57.5 |
| 1965 | 810,900 | 0 | 7189 | 803,711 | 58,312 | 13.8 | 4.1 | 7.2 | 57.0 |
| 1966 | 829,900 | 0 | 1293 | 828,607 | 59,859 | 13.8 | 4.1 | 7.1 | 58.3 |
| 1967 | 857,500 | 0 | 1703 | 855,797 | 61,469 | 13.9 | 4.2 | 7.2 | 58.1 |
| 1968 | 860,000 | 0 | 2708 | 857,292 | 63,143 | 13.6 | 4.1 | 7.1 | 57.4 |
| 1969 | 877,200 | 0 | 3583 | 873,617 | 64,877 | 13.5 | 4.0 | 7.1 | 56.8 |
| 1970 | 690,100 | 0 | 1900 | 688,200 | 66,671 | 10.3 | 3.1 | 6.2 | 49.4 |
| 1971 | 740,100 | 0 | 1300 | 738,800 | 68,522 | 10.8 | 3.2 | 6.2 | 51.6 |
| 1972 | 818,100 | 0 | 700 | 817,400 | 70,432 | 11.6 | 3.5 | 6.3 | 54.7 |
| 1973 | 820,200 | 400 | 3400 | 817,200 | 72,408 | 11.3 | 3.4 | 6.3 | 53.2 |
| 1974 | 822,082 | 80 | 5203 | 816,959 | 74,456 | 11.0 | 3.3 | 6.2 | 53.3 |
| 1975 | 640,070 | 0 | 2029 | 638,041 | 76,582 | 8.3 | 2.5 | 5.3 | 46.7 |
| 1976 | 641,605 | 0 | 4018 | 637,588 | 78,784 | 8.1 | 2.4 | 5.4 | 44.9 |
| 1977 | 643,769 | 400 | 3737 | 640,432 | 81,057 | 7.9 | 2.4 | 5.2 | 45.1 |
| 1978 | 646,895 | 40 | 3123 | 643,812 | 83,395 | 7.7 | 2.3 | 5.7 | 40.9 |
| 1979 | 647,128 | 225 | 5246 | 642,107 | 85,786 | 7.5 | 2.2 | 5.4 | 41.2 |
| 1980 | 646,970 | 101 | 10,324 | 636,747 | 88,221 | 7.2 | 2.2 | 4.6 | 47.2 |
| 1981 | 651,256 | 33 | 8696 | 642,593 | 90,700 | 7.1 | 2.1 | 4.6 | 46.6 |
| 1982 | 689,498 | 0 | 10,299 | 679,199 | 93,222 | 7.3 | 2.2 | 4.5 | 48.6 |
| 1983 | 726,587 | 0 | 15,658 | 710,929 | 95,769 | 7.4 | 2.2 | 4.6 | 48.1 |
| 1984 | 756,013 | 0 | 22,093 | 733,920 | 98,320 | 7.5 | 2.2 | 4.6 | 48.3 |
| 1985 | 775,631 | 0 | 28,357 | 747,274 | 100,862 | 7.4 | 2.2 | 5.0 | 44.5 |
| 1986 | 796,910 | 0 | 26,618 | 770,292 | 103,384 | 7.5 | 2.2 | 5.0 | 45.1 |
| 1987 | 817,003 | 0 | 28,535 | 788,468 | 105,898 | 7.4 | 2.2 | 5.0 | 45.0 |
| 1988 | 829,929 | 0 | 29,209 | 800,720 | 108,428 | 7.4 | 2.2 | 4.8 | 45.3 |
| 1989 | 843,611 | 18 | 27,916 | 815,713 | 111,015 | 7.3 | 2.2 | 4.6 | 47.7 |
| 1990 | 847,830 | 20 | 28,311 | 819,539 | 113,684 | 7.2 | 2.1 | 4.5 | 47.4 |

Source: Food and Agriculture Organization of the United Nations, *Fish and Fishery Products—Food Balance Sheets*, Rome (FAO, 1993c).

population can afford good *toro*, which costs about \$75 for two bite-size pieces... (Seabrook, 1994).

Thirty thousand dollars could buy a lot of basic fish (e.g. small pelagics) to serve as food for the needy or even the middle class rather than for the rich. But of course that does not happen, because fisheries are managed primarily to maximize incomes to their owners. Other possible motivations such as nutritional benefits, protection and enhancement of the environment, the creation of employment opportunities, the alleviation of poverty, and other values are secondary—and understandably so. We should not be under any illusion that the major purpose of fishing (or other forms of food production, such as farming) is to meet nutritional needs.

Most fisheries development efforts focus on large-scale commercial fisheries, especially those that are export oriented. However, as the World Bank acknowledges, “small-scale fisheries provide most of the fish consumed by people in developing nations”. Moreover, the Bank points out that for each calorie of food output, coastal fishing uses only one-fifth the fuel that deep-sea fishing requires (Sfeir-Younis and Donaldson, 1982). Small-scale fishing also requires

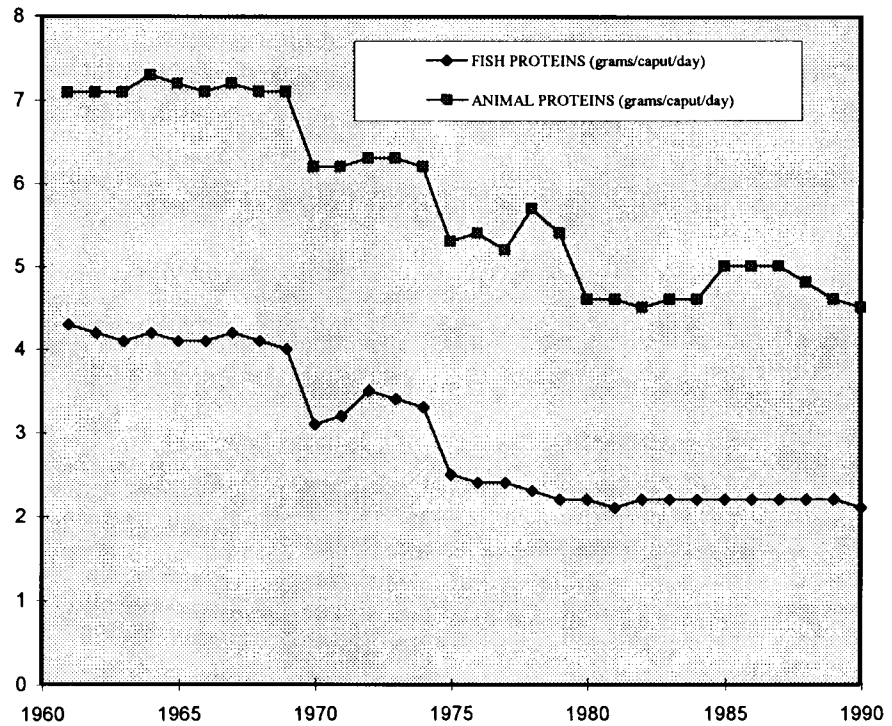


Figure 2 Fish and animal protein supply in Bangladesh.

less capital, produces more employment opportunities per unit of capital, and yields a broader distribution of benefits than large-scale fishing. Therefore if nutrition is a significant concern in fisheries management, more attention should be paid to the contribution of small-scale operations.

Large-scale fishing operations yield large revenues, but small-scale fishing operations yield great nutritional benefits. In some areas small-scale fishing produces more tonnage, overall, than commercial fisheries. In the Philippines, for example, municipal fishers account for 50% more production than commercial fishers (World Bank, 1989). The small-scale operators provide a much higher proportion of the fish food supply for the poor. Therefore, although economic efficiency may motivate large-scale operations, considerations of social efficiency should motivate support from national and international agencies for small-scale operations.

Trade

Special attention should be given to the impacts of international trade in fisheries products. It is evident that by enlarging markets trade has contributed to the expansion of overall fish food supplies. It also contributes to the over-expansion of production, in the sense that excessive harvesting leads to destruction of the productive environment. Here, however, the concern is with the impacts of trade on fish supplies for consumption by the poor.

International trade in fisheries products has been growing rapidly, at an annual rate of approximately 18% in the 1970s and nearly 10% in the 1980s. The growth in exports has been more rapid for the developing nations than for the developed nations. Developed nations

consistently account for over 80% of the imports in terms of value, and close to 80% in terms of quantity. Much of the trade is in high-value products such as shrimp, tuna, squid, and salmon, but fishmeal is also a significant factor in international trade.

In world food trade there is a net flow from poorer nations to richer nations. In 1986, for example, developed nations received over 75% by value and over 62% by weight of all food imports, whereas developing nations took no more than 25 and 38%, respectively (Abraham, 1991). In world fisheries trade the share imported by developed nations is even higher. As Table 5 shows, in 1988–1990, developed nations imported 76% by weight of the food fish in international fisheries trade. (Total world exports differ slightly from total world imports because of differences in the methods of measurement.)

The developed nations import more than they export, whereas the developing nations export more than they import. This means that there is a net flow from developing to developed nations. Whether this should be viewed as problematic remains a matter for debate. As advocates of the free market would point out, the poor nations are paid for this food, and they would not engage in this production and export of food unless they saw it as advantageous. More specifically, those who feel that the prevailing pattern of fisheries trade is not problematic point out that:

- A large share of the international trade in fishery products consists of high value products such as shrimp and tuna that are of little interest to consumers in the poorer nations.
- Most fisheries trade is among developed nations. Currently the net flow of food fish from developing to developed nations is only about two or three million metric tons per year, less than 3% of total worldwide fisheries production.
- Foreign exchange earnings from the export of high-value food products can be used to import much larger volumes of low-cost foods, with a large net nutritional gain.
- There is no systematic evidence that export-oriented nations suffer from higher levels of malnutrition.
- Fisheries trade yields substantial foreign exchange earnings for the exporting nations. In 1991 developing nations earned over \$11 billion from fisheries trade.
- Trade operations often yield spillover benefits from the use of fisheries resources which, without trade, might not be available at all. For example, undersized or off-grade fish might be provided to the local community at very low cost.

Critics of the trade raise different points:

- Excessive production for foreign markets can lead to environmental damage, depleting fish stocks and damaging their habitats.
- Poor nations are more dependent on fish for animal protein in their diets than rich nations.
- Fisheries trade can lead to declining food security in poor exporting nations. In Senegal,

Table 5 International fish food trade (in live weight equivalent, average 1988–1990)

| Group | Imports (metric tons) | Exports (metric tons) |
|----------------------|-----------------------|-----------------------|
| Developed countries | 13,920,216 (76%) | 10,783,836 (63%) |
| Developing countries | 4,336,357 (24%) | 6,465,305 (37%) |
| World | 18,258,573 (100%) | 17,239,141 (100%) |

Source: Food and Agriculture Organization of the United Nations, *Yearbook of Fisheries Statistics: Commodities*, Vol. 75, Rome (FAO, 1994), Table 1.

for example, "species once commonly eaten throughout the country are now either exported or available only to the elite" (French, 1993).

- Export-oriented fisheries may divert resources such as labour and capital away from production for local communities.
- Export-oriented fisheries may interfere with fisheries for local communities. For example, in many places large trawlers seeking products for export operate near the shore, interfering with small-scale fishing operations producing for local markets.
- Although earnings from exports might conceivably be used to import cheap food for those most in need, usually they are not used that way. The poor are not the ones who decide how foreign exchange earnings are spent.
- The benefits of trade between partners of uneven power will be distributed unevenly, with the result that the gap between them steadily widens.
- The volume of exports from developing nations, and even the price, may not be a good indicator of the extent to which the people of those nations draw economic benefit from the trade. Many fisheries operations in developing nations are owned by people from developed nations.⁴
- Excessive promotion of exports can lead to decreasing commodity prices, to the disadvantage of exporting nations.

In some ways both the advocates and the critics of fisheries trade are correct. Increasing foreign exchange earnings is of particular interest to governments and to the richer people within poor nations. When a nation shifts to increasing export orientation in its fishing operations the benefits are likely to shift from the poorer towards the richer people within the nation. Such a shift can thus result in a net gain of benefits to the nation as a whole, but a net loss to the poor. In principle it is possible to compensate for this negative effect with transfer payments to those who are harmed. The difficulty is that the poor, being politically weak, have limited ability to press for such transfer payments.

Increases in fisheries exports can lead to declines in per caput supply of fish food in several ways. In some cases, it could be a simple matter of redirecting products that had been consumed locally to buyers abroad who are willing to pay more for the products. Often, however, the linkages between exports and domestic supplies are more complicated than that. The export product may be a product such as shrimp or tuna, for which there is little demand in the exporting nation. But there may be a linkage in that coastal areas that had previously been used as a source of locally consumed products are now dominated by producers of shrimp for export. Or it may be that small fish that had been consumed by villagers along the coast are now being taken for use as bait or for culturing by export-oriented operations. Or it may be that the government, interested in increasing its foreign exchange, invests far more of its energy and resources in promoting export fisheries than in promoting fisheries that would supply local consumers.

Although export orientation can be a serious problem in particular locations, the evidence overall does not support the generalization that the developed nations of the world are draining the developing nations of their basic fish food supplies through trade. Where fish food supplies per caput are declining sharply, it is primarily due to increases in population size, not to the

⁴Under the Lomé Convention the quotas and tariffs faced by others in accessing the market of the European Union are not imposed on certain African, Caribbean, and Pacific countries (the ACP countries). This privileged access applies not only to fresh fish but also to exports of canned tuna from the ACP countries to Europe. Most of the tuna canneries in these countries are owned by the French.

diversion of products that had been consumed locally. In Bangladesh, for example, although it is true that exports have been rising steadily, in 1990 fisheries exports still amounted to only approximately 3.3% of its total production. It appears that in most nations increasing exports usually come from new production, not from the diversion of fisheries products that had been consumed locally. Although the overall global pattern in fisheries trade is not seriously problematic, there are specific cases that require further attention. In the 1980s in Malaysia and Surinam, for example, exports generally increased even while total production declined, resulting in significant declines in total fish food supply (FAO, 1993c). In places such as Senegal, Bangladesh, Mexico and India, the aggregate data may suggest that exports do little harm to fish food supplies for the country as a whole, but the impact may be serious in particular locations (Kurien, 1993).

Fisheries trades' effects on nutrition and food security are sometimes positive and sometimes negative, depending on local circumstances. A large volume of frozen small pelagics, canned fish, and other products is imported into West Africa, including Cameroon, Congo, Côte d'Ivoire, Ghana, Nigeria, Togo, and Zaire, some of which comes from other developing nations in Africa. Under some conditions increasing fish trade among developing nations could yield improved supplies for the poor (FAO, 1993b). However, imports into developing nations are more likely to be used to supply people of relatively high income in those nations, including visitors. The nutritional impact of enhanced trade among developing nations would have to be judged on a case-by-case basis.

The fish supply per person in developed countries is almost three times that in developing countries, not because of trade but because total production by developed countries is almost three times as high per person. Fisheries exports play only a modest role in distributing the world's fisheries resources. However, there are also other mechanisms of reallocation at work. For example, there is an invisible fish trade in the form of livestock and related products. About half the fishmeal produced in the world is exported, much of it going to developed nations to serve as livestock feed. In 1990, for example, fish meal trade amounted to approximately 16 million tons in live weight equivalent, and about one fifth of that in terms of actual product weight. In some cases, though, the livestock-raising process occurs in developing nations, and the finished products are exported to developed nations. Fish can thus be transferred across borders after transformation into chicken, pork, or even mink coats. Fishmeal may be transformed into other fisheries products through aquaculture operations, in which case the volume of fish exported would be much less than if the fishmeal itself had been exported.

Also, under the new Law of the Sea there has been a reallocation of marine resources to the developed nations in two stages. First, with exclusive economic zones (EEZs) extending out to 200 nautical miles everywhere, developed nations gained larger increases in jurisdiction than developing nations. Second, developing nations, finding that they do not have the capacity to exploit fully their EEZs, license outsiders, including fleets from developed nations, to fish in their waters. When a nation licenses other nations to fish its waters, its catches are recorded as catches of the nations whose flags these vessels fly. As a result there has been a significant transfer of control over fisheries resources from developing to developed nations. More than a third of the fish caught off the coast of West Africa, for example, is taken by foreign fleets. Licensing results in the effective export not only of fish but also of jobs. Trade is thus not the only means for reallocating fisheries resources.

There is no reason for a blanket condemnation of fisheries trade, but by the same token the trade should not be promoted indiscriminately, without regard to its nutritional, environmental, and other impacts. Fisheries trade should not be maximized; rather it should be optimized,

with several sorts of value considerations taken into account. The Sub-Committee on Fish Trade of FAO's Committee on Fisheries recognizes that trade promotion should be undertaken "bearing in mind aspects of national and regional food security". Impacts on nutrition and food security are sometimes considered informally, but methods need to be designed for assessing these impacts more systematically.

Conclusion

Increasing food security for the world's population as a whole can result in decreasing food security for the poor. As distant-water fleets have moved into the coordinated global economy for fish products, they have reduced their landings of lower value fish in developing countries, especially in West Africa. Trade tends to move fish away from poor people. As the demand for low-value species for feed or for manufactured consumer products such as fish cakes increases, the availability of such species for the poor declines (FAO, 1995). Increasing food security for the middle class and the rich can thus result in shifting food resources away from the poor.

Simply increasing overall food supplies by increasing productivity—whether in agriculture, fishing, or aquaculture operations—may not contribute significantly to the food supplies of the poor. New food supplies are likely to go to those who are better off. Fisheries products, like other foods, tend to move towards those who can pay for them. With increasing production, national per capita consumption levels may increase, but with no corresponding increase in consumption by the poor.

Food insecurity means having difficulties in obtaining one's desired or customary food supply. For people with abundant alternatives, the risk of having less fish or lower quality fish may be little more than an annoyance. However, for poor people who are highly dependent on fish in their diets, insecurity with regard to fish food supplies means that they are exposed to real harm. When fish supplies are short and prices go up, poor consumers are forced to shift to inferior foods, and their already monotonous diets become even less varied, putting them at risk of missing important micronutrients. When people whose budgets are largely devoted to food face a large increase in the cost of one of their major foods, they become worse off economically as well as in nutritive terms. Fish used to be known as poor people's food. However, when fish supplies deteriorate, fish tends to disappear first from the plates of the poor.

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