

## MARINE FISHERIES AND THE LAW OF THE SEA: A DECADE OF CHANGE

### II. The decade's developments

#### FISHERY RESOURCES

##### Marine catch and changes in production patterns

World marine fisheries production has increased almost fivefold over the past 40 years, rising from around 18 million tonnes to more than 86 million tonnes by 1989. Catches for 1990 indicate a decline to 83 million tonnes but, at the trend rate of the past 20 years, the total catch would exceed 100 million tonnes by the year 2000.

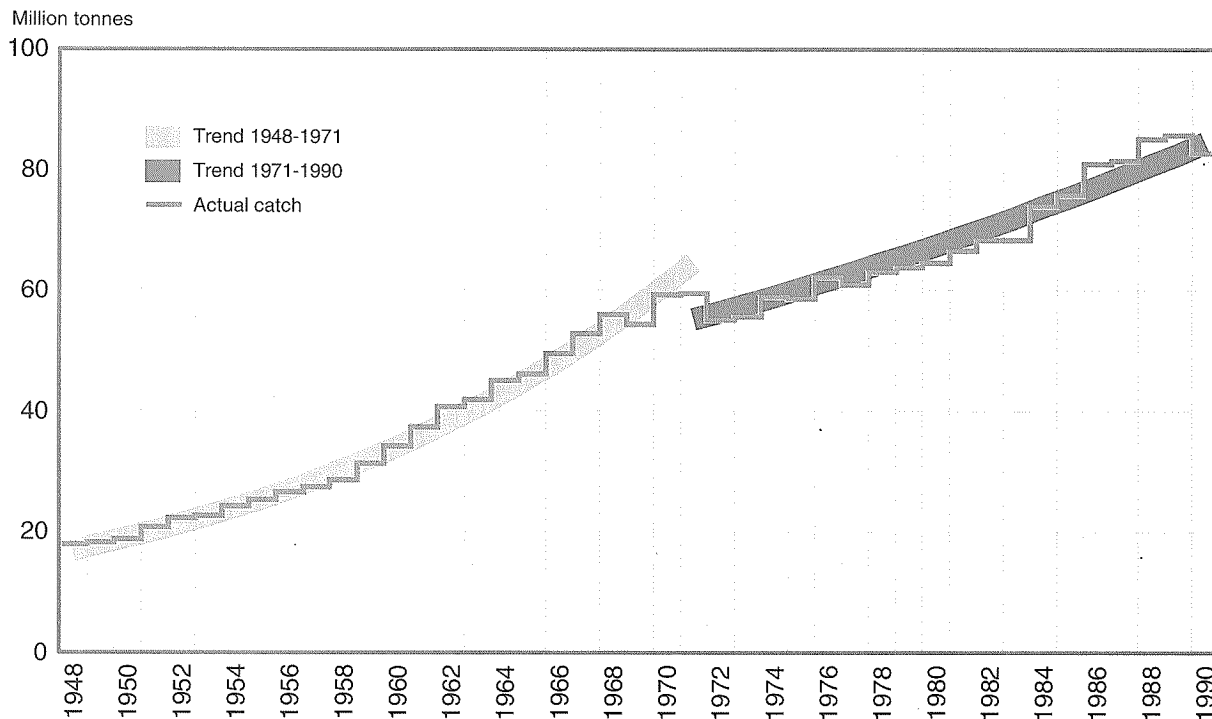
Prior to 1970, the world catch of marine fish rose at the rapid rate of 6 percent per year but the collapse from 12 million to 2 million tonnes

in Peruvian anchoveta fishing between 1970 and 1973 reduced the total catch of all marine species and marked a major break in the growth rate. Over the ensuing two decades, global marine catch rose by only 2.3 percent per year (Fig. 17).

Institutional, environmental, socio-economic, biological and technological factors were all influencing this pattern of expansion in world fisheries during this initial decade of Exclusive Economic Zones (EEZs). For example, technological advances, including the introduction of on-board freezing and processing, enabled fishing fleets to exploit fish stocks far away from home ports. The advent of

Figure 17

#### GROWTH IN GLOBAL MARINE CATCH



Source: FAO



synthetic twines and the mechanization of hauling gear led to the design of bigger and more durable nets while electronic fish detection and navigational aids increased the efficiency of the deployment of both fishing vessels and gear.

Five species accounted for most of the production increase during the 1980s. The catch of Alaska pollack, Chilean jack mackerel, Peruvian anchoveta, Japanese pilchard and South American pilchard increased from 12 million tonnes in 1980 to 25 million in 1989 (Fig. 18). The Japanese and South American pilchard share with the Peruvian anchoveta the characteristic of widely fluctuating yields as a result of natural variability. These stocks are expected to decrease in the future. Indeed, Japan's catch of Japanese pilchard dropped from 4.49 million tonnes in 1988 to 3.68 million tonnes in 1990.

These are also five relatively low-valued species. Alaska pollack has an average unit value of about one-third that of all other species. The average unit values of the other four species are about 10 percent of the overall average value while, together, the five species only contributed about 6 percent of the total

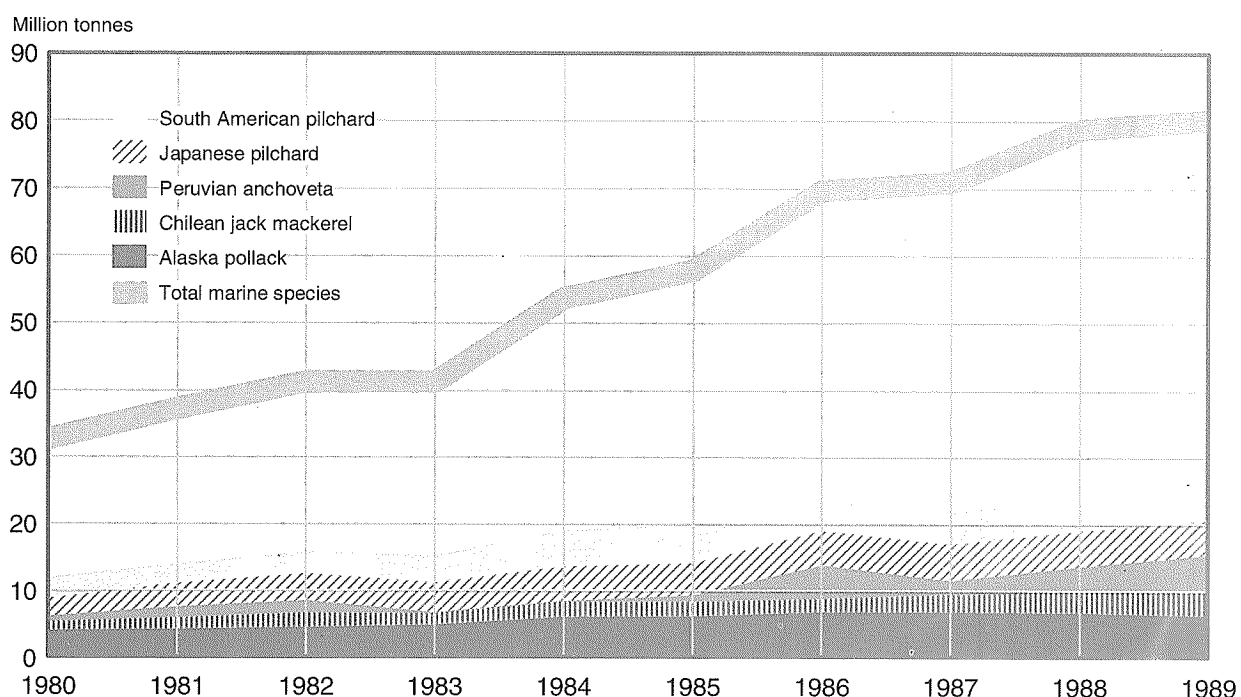
value of production in 1989. Thus, the increase in the total catch of these five species makes a relatively low economic contribution to the growth in output.

Catch has also increased for higher-value species which are facing increased demand. The catch of all tuna increased fairly steadily during the past two decades, adding 1 million tonnes to the total annual catch between 1980 and 1989. The catch of skipjack and yellowfin tuna have increased at a rate of 5.4 percent and 4.5 percent per year, respectively, since 1970.

Skipjack stocks throughout the world are apparently abundant and have high rates of reproduction, which may allow significant increases in the global catch. Similar increases are less likely for yellowfin tuna and unlikely for the other major market species (albacore, northern and southern bluefin and bigeye). There have, however, been recent increases in the catch of albacore, particularly by Taiwan, Province of China, whose catch rose from an average level of about 60 000 tonnes during the period 1977-1985 to almost 140 000 tonnes in 1989. This was a result, at least in part, of the expanded use of large driftnets, a fishing technology capable of filtering great quantities

Figure 18

GROWTH IN CATCH OF MAJOR SPECIES



Source: FAO



of water on the high seas.

Shrimp are another group of species contributing to the increase in total marine catch. Total catch from all sources (marine and inland, capture and culture) rose from 1.1 million tonnes in 1970 to 1.7 million in 1980 and 2.4 million in 1989. The most dramatic increase occurred in China where total shrimp production rose fivefold over the two decades to reach more than 500 000 tonnes, or about 20 percent of total world output. In 1989, aquaculture accounted for about one-third of Chinese shrimp production. World production of shrimp by aquaculture in both fresh and marine water grew rapidly, reaching a total of 509 000 tonnes in 1989 (Fig. 19).

Salmon production was about 400 000 tonnes during the 1970s, reaching 600 000 tonnes in 1980 and rising to more than 1 million tonnes in 1989. This was a result of both the recovery of stocks through more effective conservation measures and production through aquaculture. Salmon production by aquaculture mainly began in Norway in 1980, with several other countries quickly following suit. Norway currently accounts for more than 25 percent of total salmon production. Prices of salmon have

declined markedly as a result of increased production from both capture and culture fisheries (Fig. 20).

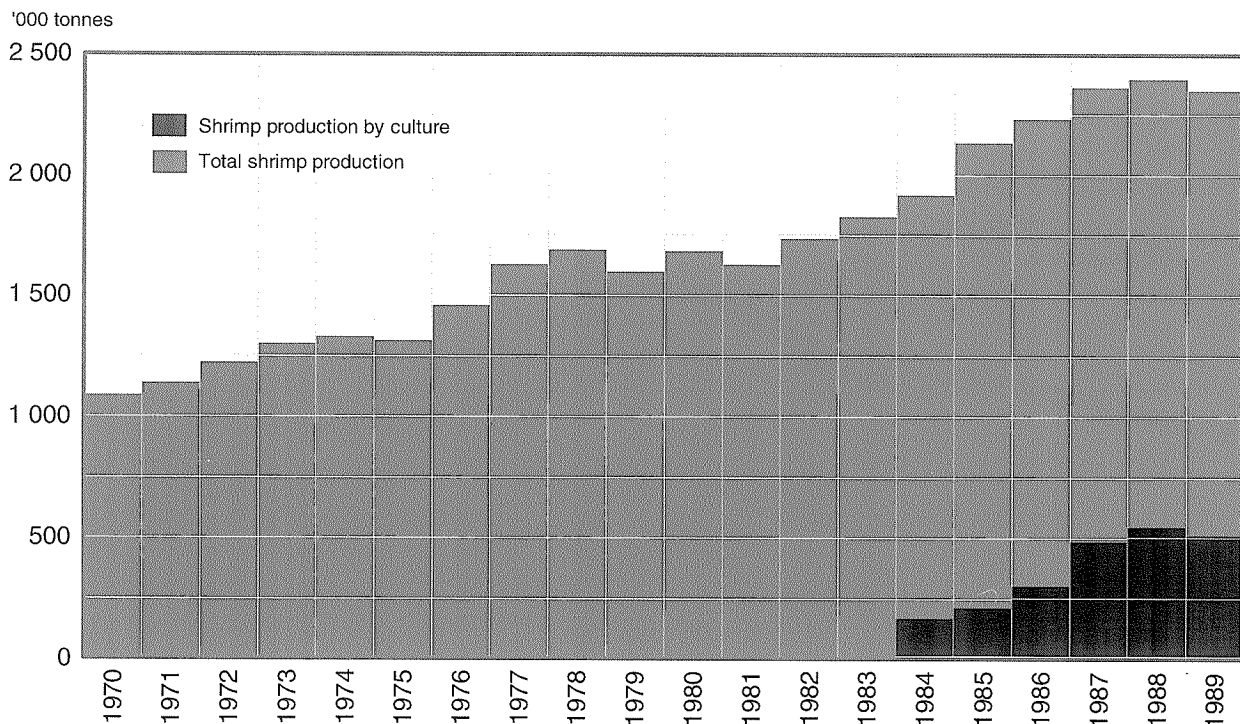
The significant overall increase in the global marine catch during the 1980s obscures a number of features that give cause for concern. First, there is little reason to believe that the global catch can continue to expand, except for increases that might occur through more effective management of stocks. The stocks that have accounted to a large extent for the recent growth are the small shoaling pelagics, such as sardines, pilchards and anchovies. These stocks are subject to wide fluctuations in biomass. Some of them are at the peak of their cycles and can be expected to decline in the future although, since others may increase to take their place, the aggregate catch is not likely to change.

Moreover, these species are mostly used for the production of fish-meal and have a low value, thus making a relatively small contribution to the global economy.

An aspect raising more concern is that of the continued overfishing of many individual stocks of fish. Although there are instances of stock rehabilitation through the adoption of

Figure 19

### WORLD SHRIMP PRODUCTION



Source: FAO