

Encyclopedia of Earth

Fisheries and aquaculture

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Overall fisheries production

In 2002 the global production from fishing and aquaculture combined reached about 133 million tonnes. The global yield from capture fisheries is stagnating, but aquaculture has been expanding.

The quantities of fish captured remained stable at about 93 million tonnes per year between 1999 and 2002. China and Peru are leading the top ten of countries with the largest catches. The same countries have remained in the top ten for over a decade.

Oceans and seas provide 90% of the world's fishery catches. During the past decade marine catches brought to land increased slightly compared to the preceding decade. It should be noted that the quantity of marine fish caught and discarded fell by several million tonnes in the same time period. Trends vary greatly across different regions and for different species. The species yielding the largest harvest is the Peruvian anchoveta.

Most marine catches take place in coastal waters. However, the share of catches from the open ocean has increased in recent decades and reached 11% of all marine catches in 2002. This marked increase was paralleled by a growth in trade, especially in tuna products. Deep-water fishing activities are increasingly monitored and reported.

Catches from inland waters accounted for a little less than 10% of the total catch in 2002. The bulk of world production came from developing countries, particularly in Africa and Asia. China alone accounted for a quarter of global inland water capture fisheries. Statistics of inland catches are, however, unreliable. For instance, many countries do not report catches made by rural communities, which are often the main users.

Aquaculture is the fastest growing animal based food-producing sector, particularly in developing countries. This sector alone contributes nearly a third of the world's supply of fish products. China and other Asian countries are by far the largest producers. Unlike terrestrial farming, where the bulk of production is based on a limited number of species, aquaculture production derives from more than 220 species. Of these species, carps and related fishes form the largest group in terms of quantity. Other groups include molluscs and aquatic plants. Fast growing emerging activities include the farming of Atlantic cod and fattening of wild-caught tuna.

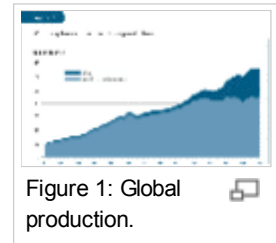


Figure 1: Global production.

The situation of fishers, fish farmers and the fishing fleet

Fishery and aquaculture provide direct employment and revenue to an estimated 38 million people; mainly fishers but also increasingly fish farmers. Detailed statistics are often not easily available, especially for small-scale fishing activities in developing countries. The general trend is that the number of jobs for fishers is stagnating and that opportunities in aquaculture have been increasing, though less so since 2000.

Natural hazards such as cyclones, floods, and tidal waves can have devastating effects on fishing communities. In emergency situations support to the fishery sector may be critical in providing people with means of survival.

After years of expansion of the world fishing fleet, the number of decked vessels has remained fairly stable since the early 1990s. A very large portion of the total fleet is concentrated in Asia. The average age of larger marine fishing vessels is increasing, which raises concerns over safety and standards of accommodations for the crew. The combined carrying capacity of large marine fishing vessels reached a peak in 1992 and later declined because of the adoption of programs to reduce the capacity of fishing fleets.

In several major fishing nations, such as New Zealand, the fleet size has continued to decrease. Some of the large vessels are scrapped, others register in different countries, and some are known to operate under unknown flags.



Purse Seiner, France. (Source:  FAO)

The state of fishery resources

The quantities of fish harvested from seas and oceans increased from 1998 to 2000, and stabilized at a slightly lower level since 2001 (84 million tonnes). This slight decrease is mainly due to lower catches in the Southeast and Northwest Pacific, but trends vary greatly between regions. Tuna is the single most important exploited resource in the high seas, particularly in the Pacific Ocean.

In many areas, traditionally fished stocks have been depleted and less valuable species are now being targeted by fishers. According to the United Nations' Food and Agricultural Organization, about half of all monitored stocks are now fully exploited and another quarter are overexploited, depleted, or slowly recovering. The remaining quarter are under- or moderately exploited. Available data lead to the conclusion that the global maximum potential for marine capture fisheries has been reached and that more restrictive management measures are needed to sustain many fisheries.

Fishery policies and management have usually focussed on single fishery stocks. Growing concerns about ecosystems have prompted a call for increased research into processes that affect, or are affected by, fisheries. To implement ecosystem-based fishery management effectively, more needs to be known about interactions of fishes with habitats, aquatic communities, land-based activities, climatic changes, and so on. However, the current state of many fishery resources and their associated ecosystems urges prompt action in more effective management.

Fish stocks in inland waters are more difficult to monitor and very few countries can afford to supply complete data. Inland fishery resources are often undervalued and under threat from unsustainable fishing activities as well as from habitat alteration or degradation. Many river basins, especially in developing countries, support intensive fisheries, and in many cases catches are increasing. Inland fish are considered to be the most threatened group among all the vertebrates used by humans. Nevertheless, efforts have been made in many areas to enhance fish stocks in inland waters.

The use of fishery products



(Source: FAO)

Fish is mainly consumed fresh or processed in frozen, canned, or cured form. More than three-quarters of the world fish production is consumed by humans. Most of the remaining portion is fed to animals, particularly in the form of fishmeal.

Fish and seafood consumption vary greatly between different regions of the world, from 1 kg to more than 100 kg per person per year. The worldwide average use of food fish reached 16.2 kg per person in 2002. Per capita production and consumption are particularly high in China and in other Asian countries.

In many parts of the world the fisheries sector can help to reduce poverty and achieve food security. Developing countries now supply 70% of all the fish for human consumption, making an important contribution to their economies.

Fisheries should be effectively integrated into national policies related to poverty reduction and rural development.

The amount of fishery products traded

World fish trade has increased in terms of both value and quantity. In 2002, China overtook Thailand for the first time to become the world's main exporter of fish and fish products, with exports valued at an estimated US\$4.5 billion. The largest importer in 2002 was Japan, with over one fifth of the world's imports.

As fish is highly perishable, more than 90% of internationally traded fishery products are processed (frozen, canned, or cured). Products derived from aquaculture account for an increasing share of the international trade in fishery commodities.

Fish exports are an increasing source of foreign exchange earnings for many developing countries. These earnings are significantly higher than those coming from other commodities such as rice, coffee, and tea. Exports from developing countries are gradually shifting from providing raw material for the processing industry in developed countries to selling high-value live fish or processed products. Trade in fishery products is increasingly covered by international agreements.

Major market segments for fishery products include salmon, tuna, other finfish, shrimp, squid, and octopus, as well as fishmeal used to feed animals.

Contaminants that affect fisheries

Several substances can find their way into fish and seafood. Examples are metals such as mercury and arsenic, persistent organic compounds such as dioxins and PCBs, or residues of antibiotics and hormones used in aquaculture.

Certain elements are essential for life at low concentrations but become toxic at high concentrations. Others are toxic even at low concentrations when ingested over a long period. To what extent particular chemical contaminants are present in seafood depends greatly on factors such as geographic location and species.

Several studies have concluded that levels of contaminants in fish intended for human consumption are low. It is believed that these levels are below those likely to affect human health. However, some consumers consider that even minimal levels of contaminants might endanger their health. Such concerns can easily start food scares which have significant negative impacts on fish trade.

Increased international trade offers many benefits but also presents new safety and quality challenges. Some have called for maximum levels of contaminants to be set to ensure the highest possible level of consumer protection, while taking into account that all fish are exposed to background levels of pollution. Strategies have also been suggested to reduce this background contamination of the environment and to better inform consumers.

(For more information on specific contaminants of fish, you can see the GreenFacts Studies on Arsenic, Dioxins, Mercury, and Polychlorinated biphenyls)

See also GreenFacts' Studies on contaminants



Arsenic



Dioxins

Regulation of fisheries

International interaction and collaboration on fisheries matters relies on a large number of regional fishery bodies (RFBs). In the last 50 years, these have gained a more active role in decision-making. Their role particularly changed after the early 1990s as a result of the growing awareness of the scarcity of fishery resources. However, strengthening regional bodies does not always translate into more effective fisheries management. Their actions can be limited if countries do not give them enough power or do not implement their decisions.

Aquaculture is being increasingly regulated, by measures such as labelling for origin, traceability, and veterinary drug residues. Major importing regions and countries have begun to set stringent standards and regulations to ensure quality and safety and to reduce the social and environmental impacts of production. In many developing countries, however, progress towards sustainable practices is slow.

Development policies increasingly perceive aquaculture as an engine for economic growth. The aquaculture sector does indeed expand, diversify, intensify, and advance technologically at a faster pace than any other animal-producing sector.

Conclusion

The "The State of the World Fisheries and Aquaculture" (2004) concludes that developments in world fisheries and aquaculture during recent years have continued to follow the trends that were already becoming apparent at the end of the 1990s: capture fisheries production is stagnating and aquaculture output is expanding faster than any other animal-based food sector.

There are growing concerns with regard to safeguarding the livelihoods of fishers as well as the sustainability of both commercial catches and the aquatic ecosystem from which they are extracted.

About three quarters of monitored marine stocks are now fully exploited, overexploited, or even depleted. Therefore, there seems to be no further potential for increasing marine catches and the current state of many fishery resources and their associated ecosystems urges prompt action toward more effective management.

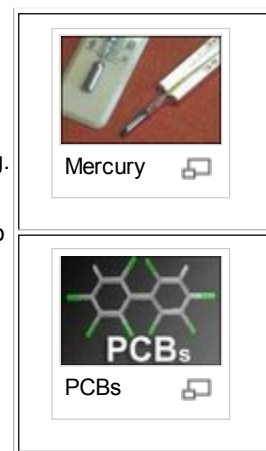
Links

The full FAO report "The State of the World Fisheries and Aquaculture" (2004) provides a general review of fisheries resources (Part 1 summarized in questions 1 to 8), and more detail on specific topics. A faithful summary of this FAO was produced by GreenFacts

The FAO also publishes a periodical , which includes more detail on fishery resources in specific areas.

Notes

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