

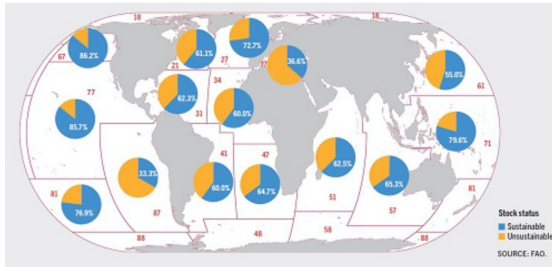
Environment ▾ Fisheries

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FAO analyses depend on estimates

July 11, 2024



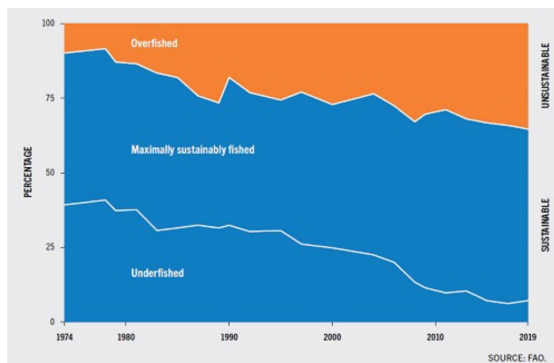
Percentages of biologically sustainable and non-sustainable fish stocks in the individual FAO Fishing Areas (as of 2019).

More overfishing despite increasing sustainability?

According to the FAO, the proportion of overfished fish stocks increased from 10 to 35.4 per cent between 1974 and 2019. A dramatic finding, but it does not fit in at all with the global initiatives and efforts of the fishing industry to achieve greater sustainability. They have led to demonstrable successes! This inevitably raises the question of how the FAO collects its data and how reliable its statements are.

The basis of marine fishing is clearly not in a good state. According to FAO estimates, the proportion of fish stocks that are biologically sustainably fished has fallen from 90 per cent (1974) to a pitiful 64.6 per cent (2019). Only just under two thirds of the resources are currently being used sustainably. The situation is particularly depressing in FAO Fishing Area 87 (Southeast Pacific), where only a third (33.3%) of stocks is at a sustainable level. The Mediterranean and Black Sea (FAO Area 37) follow closely behind with a shameful 36.6 per cent. However, this information does not reveal the extent of overfishing. Are the quantities taken perhaps only 5 or rather 50 per cent above the acceptable sustainability limit? Statements on this would be important, because the respective contributions to global fisheries yield differ very significantly. While the Mediterranean and Black Seas contributed only 1.19 million tonnes to the global fish stocks despite overfishing, the Southeast Pacific still contributed 8.40 million tonnes.

Overfishing of the oceans has become a much-discussed, on-going issue in public. Countless TV reports and articles in the print media report on the issue in a more or less serious manner, and even cooking shows rarely omit warnings to critically examine the origin of the fish used. The supposedly negative developments of the last few decades have even led overzealous commentators to make exaggerated statements about 'empty seas' to be feared in the foreseeable future. As absurd as this hysterical alarmism may be, it has an effect and is ingrained in the minds of many people. The debate therefore urgently needs to be made more objective. Instead of arguing with 'fake news', it must be conducted with solid, verifiable facts, without glossing over or even trivialising the state of the seas.



Global trends in the status of marine fish stocks from 1974 to 2019.

World fisheries are based on relatively few species

In this context, the question arises as to how the FAO collects data on fish stocks and fisheries for its analyses and how representative, reliable and secure they are. The accuracy and credibility of the subsequent assessments depends crucially on the precision of the data basis. The FAO's catch statistics record landings of more than 2,600 species in

total. 85% of these are fish species, i.e. around 2,200. The rest are crustaceans, molluscs, algae, and more specific species ranging from crocodiles to turtles and frogs to echinoderms (sea urchins, sea cucumbers). Compared to the total number of known fish species, which is estimated at least 25,000, more likely 30,000, 2,200 species may seem a small proportion, but this impression is deceptive. In essence, global fishing is supported by only around 100 species. The 10 most productive fish species account for almost a third (31%) of the total landings!

In addition to gadidae (cod, pollock, hake, etc.), tuna and tuna-like species, particularly important are the small pelagic fish (herring, sardines, anchovies), which appear in huge shoals, but whose stocks (and thus catches) can fluctuate greatly. A typical example of this is the Peruvian anchoveta (*Engraulis ringens*), which in good years allows catches of 7 to 8 million tonnes, but in bad years only 2 to 3 million tonnes. These fluctuations are mainly caused by adverse environmental factors such as El Niño or insufficient plankton development off the South American west coast. In assessments of fisheries in FAO Area 87, it is often unclear whether the lack of sustainability is actually due to fishing or rather to unfavourable environmental conditions.

Objective baseline data and subjective estimates

The FAO experts are therefore faced with the methodological problem of identifying such differences. But how can they be adequately taken into account? Regardless of whether the stocks are decimated by environmental influences or excessive extraction, overfishing remains overfishing. The FAO has been collecting data on the status and use of almost 600 major fish stocks or resource groups for which assessments are available since 1950. The statisticians of this UN organisation are doing a truly Sisyphean task. Every year they collect data on landings from 240 countries, territories or land areas and 26 large fishing areas reported by the responsible national fisheries statistics offices in standardised forms. These are separated by species or higher taxonomic levels for all commercial fisheries and recreational purposes. In addition, for many products, data is also obtained from trade associations or other specialised international organizations in order to compare and supplement the statistics. Even these few facts give an idea of the gigantic mass of data that has to be managed and pieced together. A truly impressive achievement, but one that also explains why the data foundation for the subsequent analyses has some gaps and weaknesses.

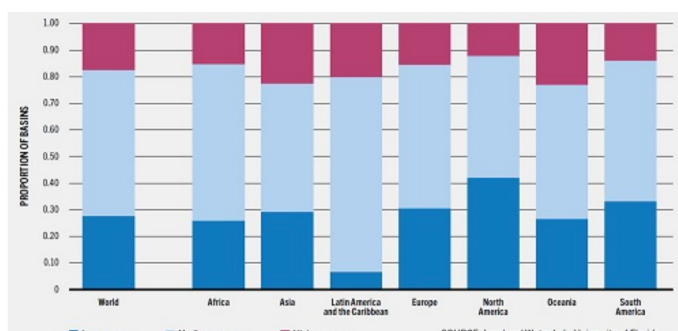
Any expert who is even remotely familiar with fishing knows that it is completely impossible to monitor tens of thousands of fishing villages and local fish markets around the world without any gaps in the process. The quantities of fish landed there and sold directly can at best be roughly estimated. Both there and often on board large fishing vessels, fish are often not strictly separated according to species. FAO statisticians include such data in the category 'not elsewhere included', which is a vague expression for 'species not precisely identified'. But that is just one of the many problems with data collection. Information on the quantities landed, for example, is based on 'nominal catches', the live weight of the animals. In some fisheries, the quantities landed actually correspond to the quantities caught. But that is by no means always the case, as the catches are often gutted, filleted, salted, dried or processed into fish meal and fish oil on board the fishing or factory vessels. The landing quantities then have to be laboriously converted back into nominal catch quantities, i.e. live weights, using conversion and correction factors. Naturally, certain uncertainties and errors are unavoidable. Fish that are thrown back after being caught, the so-called 'discard', are not listed at all in the database.

Hard facts or just a rough estimate?

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For some groups of species, such as tuna, bonito, and swordfish, which make long transoceanic migrations, data collection is particularly difficult. In such cases, data provided by national correspondents are often checked by the relevant regional authorities and, if there are significant deviations, replaced by 'best scientific estimates'. The quality and technical level of data reported by individual countries to the FAO sometimes differs significantly. One can only hope that the majority of the data is carefully collected in painstaking, meticulous detail according to international standards and is therefore trustworthy. Other data, however, may have been estimated more superficially in order to meet national reporting requirements. Not every report can be checked and corrected, if necessary, although the FAO specialists are probably trying to extract the status, trends, and negative developments in global fisheries from the enormous jumble of heterogeneous data. Analyses can only ever be as good and accurate as the data and facts on which they are based. Despite all the criticism, the arduous work of the FAO is indispensable in giving us a rough idea of the current state of the oceans. The knowledge and information assisted from policymakers in making important decisions that should lead to sustainable developments.



Threat status of the most important inland fisheries, differentiated by continent and region. The information is based on different data sources. For example, while 12 large hydrological water systems were considered in the assessment in Asia and 14 in Africa, only 2 were considered in Oceania.

The status of inland fisheries in various parts of the world is particularly difficult to assess. They too are of immense economic and social importance. After all, fishing in rivers, lakes, and other wetlands has contributed an average of around 13 per cent to the total global capture fishery in recent years (in 2020 it was 11.5 million tonnes of the total 90.3 million tonnes, or 12.7%). What makes assessments here so complicated is the strong fragmentation of many inland waters, which often cross national borders and have huge catchment areas. Regular assessments of individual fish stocks, such as in the oceans, are extremely rare, if they exist at all. In addition, their status often depends heavily on annual cyclical changes in the waters. In many regions, annual floods have a strong influence on the productivity and performance of fish populations. To make matters worse, subtropical and tropical waters are often home to a large number of fish species and fisheries are highly diversified. In addition, particularly productive lakes and river systems are often located in less developed and low-income countries that have only limited human and financial resources to monitor and manage their fisheries. Assessments of fish stocks often have a comparatively low priority there. All of this makes it practically impossible to assess the catches and the status of freshwater fish in inland waters using the same methods as in the marine sector.

Computer models support the analyses

Because reliable basic data for global inland fisheries are often lacking, FAO statisticians and analysts have to resort to other methods for their assessment of fish stocks. They use vast amounts of information from all available literature sources, combine them with the findings of local inland fisheries experts and feed all this data into computer models that calculate global threat maps for inland fisheries. Since 2016, the FAO has been working with the United States Geological Survey (USGS) and selected fisheries experts. Together, they have identified 20 possible anthropogenic pressures on inland waters that are suitable as meaningful indicators of emerging threats and problems in river and lake systems.



The landings of small-scale manual-working fisheries worldwide, which are mostly traded locally in tens of thousands of markets, can only be roughly estimated at best.

These indicators, which serve as a basis for the assessments, are combined with literature references and expert opinions. In total, more than 9,000 scientific articles were used and supplemented with statements from 536 experts from 79 countries who have detailed specialist knowledge of almost 100 inland waters. The experts determine a threat score for the water areas with which they are familiar on a numerical scale of one to ten. Scores of 1 to 3 stand for 'low pressure', 4 to 7 for 'moderate', and 8 to 10 for 'high pressure'. Although the process is very complex, it enables a relatively objective assessment of the state of global inland fisheries.

Evaluation methodology is currently being updated

Since 1971, the FAO has regularly assessed the state of fisheries and marine resources. The results have been published every two years since 1995 in the State of World Fisheries and Aquaculture (SOFIA) reports. However, the current evaluation methods have hardly changed since 2011, although both resources and fisheries have changed significantly. The FAO has therefore decided to thoroughly revise them and adapt them to the current developments in global fisheries. An important step in this project is the revision of the list of fish stocks in the various regions of the world. The current list does not adequately reflect the changed reality of global fishing. As part of this modernisation project, there are also plans to revise the reporting formats for data collection. They should be more granular and more transparent for all parties involved. Closer cooperation with fisheries experts and management institutions in individual countries is also being sought in order to improve the assessment processes. Gaps in the assessment should be closed and the validity of the information improved.

Important elements of the new methodology, such as data collection and the subsequent work-flow for processing and reporting were tested for feasibility in FAO Fishing Areas 31 and 37 in 2022. The results were then presented to the Committee on Fisheries (COFI), which advises the FAO on fisheries issues, for review at the 35th session. In order to inform the interested public about the new analysis and reporting formats, the concept is presented in the SOFIA 2024 report. However, it is already clear that the implementation of the modernised methodology for assessing the status of stocks can only be successful if national governments and regional fisheries organisations expand their capacities and

stocks can only be assessed if national governments and regional fisheries organisations expend their capacities and cooperate even more closely than before.



Diversity of species and limited human and financial resources make it extremely difficult to adequately assess the status of fish stocks in some countries

And what does all this mean for the FAO's statements on the state of fish resources, sustainability of fisheries and the extent of overfishing? Inadequacies in data collection and processing are undeniable and probably unavoidable. For this reason alone, one could ask whether harsh judgements on the extent of overfishing are really justified in their stringency. Meticulously precise percentage figures on the share of overfished stocks worldwide, accurate to the decimal point with tens of places behind them, give the impression of a level of accuracy that the data foundation used does not allow.

But although some figures may be contestable in detail, the general tenor of the reports cannot be doubted: many fish stocks are not yet fished sustainably, or at least not sustainably enough. In this respect, the FAO's statements on the status of global fish stocks should perhaps not be seen as indisputable truths, but rather as a warning and a reminder to act. They put a finger in an open wound and remind us of what must definitely change in the future, because overfishing not only endangers the biodiversity of aquatic ecosystems, but also reduces the productivity of fisheries with serious economic and social consequences. It is worth continuing efforts to rebuild the overfished stocks because their use according to MSY principles ultimately pays off for everyone. According to cautious forecasts, sustainable development could lead to an increase in catches of around 16.5 million tonnes with a total value of 32 billion US dollars.

Manfred Klinkhardt

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