Global fish stocks

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Fishy figures

Nov 29th 2001
From The Economist print edition

The world's fish catch may be much smaller than previously thought

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FISHERY statistics tend, just like fish, to be rather slippery. Lying by individuals, industries and countries is expected by the body that has collated global fishery statistics for the past half-century. But the Food and Agriculture Organisation (FAO) had assumed that, unless everybody lied at the same time and in the same direction, discrepancies in the global figures would pretty much cancel each other out.

Unfortunately, this approach overlooked the possibility that a single large contributor might be lying spectacularly. And according to Reg Watson and Daniel Pauly, two researchers at the University of British Columbia in Vancouver, that is what China has been doing for at least ten years. This, they say, has masked a big downward trend in the global fish catch.

How can local fisheries worldwide be collapsing as the global catch "increases"?

Their research was prompted by the observation that local fisheries around the world were collapsing, yet the global catch, which was expected to plateau in the 1990s at around 80m tonnes per year, was slowly increasing. Taking the FAO's fish-catch statistics since the 1950s, the researchers worked out the relationship between catch and various oceanographic and environmental factors, such as depth of the ocean, latitude, ice cover, surface temperature and distance from the shore.

After verifying that their model was able to predict the location of most high-catch regions of the world, they went on to create a global map of

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Reg Watson and Daniel Pauly are involved in the Sea Around Us Project at the University of British Colombia Fisheries Centre. See the FAO's fisheries page and *Nature* magazine.

the difference between expected (or modelled) catches, and officially reported statistics. This revealed a shocking discrepancy. In China, a catch of 5.5m tonnes was expected in 1999; but the official figure was 10.1m tonnes.

When the pair replaced official statistics with estimates, the global catch showed a wobbly downward trend, shrinking by some 360,000 tonnes every year since 1988. And when they removed the catches of a single, highly fluctuating species, the Peruvian anchoveta, the data revealed a strong and consistent downturn, of 660,000 tonnes a year. In other words, contrary to official figures suggesting that the marine catch has been slowly growing for the past few years, it has in fact been in decline.

That the Chinese figures are unreliable is hardly surprising, since until recently Chinese officials were promoted on the basis of production increases. What is surprising is that such a distortion of global statistics might be possible. The FAO offers several defences. One is that these new findings, published in this week's *Nature*, are based on modelling, which does not prove anything. The suggestion that China might be cooking the books is not new. The FAO says it has been suspicious of the Chinese figures for the past six years.

Richard Grainger, the FAO's chief statistician, argues that global figures are not important, because fisheries are managed at a regional level. This means that any inaccuracies in the Chinese figures would affect only China and not perceptions of the state of other world fisheries. Because China is not a great importer or exporter of fish, the food-security implications are limited to the region. Anyway, he says, few people look at global figures without reference to regional trends.

Not so many fish in the sea

Andy Rosenberg, a fisheries scientist at the University of New Hampshire, disagrees. He says that graphs showing a stable global catch are often shown at international meetings, not least by the FAO. Indeed, on the first page of the FAO's most recent annual report, the global fish catch is described as remaining “relatively stable”.

Dr Rosenberg also says that many countries assume that, as long as the overall picture remains healthy, fisheries management is a problem for the long term. As long as global volumes are rising or stable, it seems reasonable to conclude that the exhaustion of local fishing grounds has been balanced by the opening of new grounds farther afield. The new research suggests that this is wrong.

If the global catch is declining, despite the unprecedented effort being made to maintain production, stocks must be in decline too. What can be done? Some look to fish farming, or aquaculture, as a way of maintaining production. In the short term, this may work. But most farmed fish are fed a diet consisting mainly of fish taken out of the ocean. So although aquaculture may boost edible fish production, it is ultimately limited by marine fish resources.

One novel approach attempts to bring consumer pressure to bear. Unilever, the world's largest buyer of frozen seafood, set up the Marine Stewardship Council (MSC), in conjunction with the World Wildlife Fund, in 1998. The MSC sets environmental standards for sustainable and well-managed fisheries and awards a quality mark to those that make the grade. Unilever says it will buy all its fish from sustainable fisheries by 2005.

Many other options have been proposed to deal with the problem of overfishing, such as reducing the capacity of fishing fleets, setting up marine reserves, removing government subsidies or assigning property rights to individuals or groups of fishermen to provide an incentive for good stock-management practices. The problem with this latter approach is that it requires elaborate and expensive policing. And if stocks are stable, as the FAO's figures suggest, why bother?

As with global warming, governments will take action only when the urgency of the situation has become fully apparent. By pointing out that a stable supply of marine fish can no longer be taken for granted, Dr Watson and Dr Pauly have raised an important alarm.