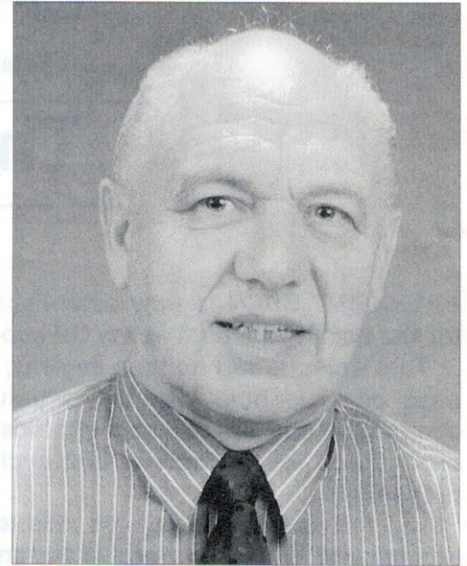


Oceans of Trouble

Crises in the use and management of the world's marine and aquatic resources are a foretaste of greater challenges that will be delivered by the increasing demands we impose on the resources of the seas. David Thompson reports.



THE SEA has provided us with a means of transport and trade, and a source of food and materials varying from whale oil and seal-skin to pearls and exotic substances extracted from corals. The sea has also been used as a theatre of war and plunder, and as a depository for waste and pollutant. Its coastal waters are a playground for the recreation and sports industries and a location for maritime and petroleum installations, as well as fish farming. These demands have now increased to the point where the health and productivity of the seas are threatened, with governments and big business increasingly concerned to assert or increase their control over the marine environment and their ownership of its resources.

The most obvious outcome is pollution, particularly of the coastal zone. The pressure on its living resources is apparent in the battle for fish ownership or harvesting rights. Both sets of demands are causing negative consequences of a social, economic, environmental and food security nature.

We were warned in the 1950s in Rachel Carson's book *The Sea Around Us*, and since then, not only environmentalists and academics but governments and bodies like the World Bank have expressed serious concern. In 1996, *Time* magazine's "State of the Planet" declared: *Without healthy seas, humanity would be doomed. Yet we keep on destroying our most precious resource before we even know what we are losing.*

Pollution

THE SEA was treated for centuries as a bottomless garbage pit which could cope with infinite amounts of toxic and non-biodegradable material. Until the middle of the 20th century this was not seen as a problem. But then came what E.F. Schumacher described in 1973 as a *quantum leap in industrial production*. The "tolerance margins" of benign nature could no longer cope.

Chemical waste, effluent and hardware from industrial plants and factories were added to increasing amounts of untreated sewage and domestic waste. Radio-active waste was and is being released from nuclear power stations and from the naval and air force nuclear weapons which are being dumped in the ocean depths in containers that will corrode and leak long before the half-life of the plutonium or strontium is reached. Agricultural pesticides and fertilizers contaminate rivers, and the run-off entering the sea is increasingly carrying nitrates and other chemicals. The Open University lists the main pollutants in the

ocean as mercury, lead, pesticides, polychlorinated biphenyls, perchlorethylene, petroleum, radio-active elements and heat.

Inshore waters where children and anglers could in recent years observe and catch a great variety of sea life, are now largely sterile apart the presence of hardy lugworms, barnacles and some shellfish which in many locations are unsafe to eat. The upper Moray Firth in Scotland was devoid of fish life for 10 years after the closure of the aluminium plant in Invergordon, which dumped much of its waste in the area. Most fishermen and anglers in the region attribute the absence of sea life to that one industrial plant. Some believe the strange disease affecting Moray Firth dolphins may have started as a result of the aluminium chemical waste.

Asia and Africa have few effective controls on dumping. Deforestation is causing soil erosion and coastal pollution. The bottom of the once pristine Manila Bay and the adjacent freshwater Laguna de Bay has been covered with a blanket of plastic bags and similar garbage for many years. Destruction of the sea-bed environment is proceeding apace off the shores of tropical countries as coral is mined and collected to supply tourist markets and as living coral beds are killed by the effects of dynamite and cyanide fishing (the latter being utilized in the capture of wild fish for the aquarium fish trade).

Fish Resources

TOTAL GLOBAL fishing capacity has risen, according to FAO estimates, to over 3.8 million vessels (1995). The world's fishing fleet displaces an enormous 30 million tons. Most decked vessels and many smaller boats now carry a sophisticated array of electronic equipment to aid in the location and capture of fish. So, as in industrial activity in general, there has also been a quantum leap in the capacity of fishing effort.

China's fleet has increased to over six million tons of vessels. When Spain became a full member of the European Union its fleet was then entitled to "equal access to a common resource", but its fleet was so large it practically doubled the size of the then EU fishing fleet.

There has not been a corresponding increase in the world's marine fish catch, which has stabilized at around 80 to 90 million (metric) tons. Once seemingly inexhaustible fisheries like those of the Peruvian anchovy, the South African pilchard, the north Atlantic herring and capelin, and now the north Atlantic cod, have all succumbed to over-harvesting.

Management efforts by governments and bodies like the European Union have in many cases failed to conserve stocks; rather, they have added to the destruction.

A classic case would be the single species quotas applied to demersal fish management in the EU Common Fisheries Policy. Since no trawl net can capture mixed species in the precise proportions required by such a measure, the end result is "discards". Mature fish are dumped overboard, dead or dying. These edible and marketable fish are lost both to the fish stock and to consumers. The amount of discards in the North Sea alone is estimated at over 600,000 tons a year (an amount almost equal to the total annual production by British vessels).

The Chief Executive of the largest fish producer's organization in Britain testified, in a submission to the Scottish Parliament European Committee, that the "scientific" basis on which Europe set its total allowable catches (TACs), was extremely flimsy. He claimed that in response to the weakness of the scientific advice, the EU resorted to the "precautionary principle" which enabled the setting of TACs without any scientific input. Taking the average catches of previous years as a reliable indication of stock size was "a scientific nonsense". This nonsense was compounded in the case of species like *nephrops* (Norway lobster or "scampi" prawns), which scientists are unable to age at all.

Fish Demand

IN 1999 FAO reviewed the rates of fish consumption together with predicted population increase. If consumption trends continued as at present, and if population increase rates remained as predicted, the global demand for fish protein would, by 2030, require double the current fish supply. Such an increase is impossible. But the figures illustrate the increased pressure for more fish that the next three decades will bring.

Every corner of the ocean is exploited, from the Arctic to the Antarctic. Vessels are now trawling and long-lining down to depths of 600 or 700 fathoms in search of hitherto unharvested stocks. It is recognized by both scientists and fishermen that further catch increases are very unlikely. But we could increase the fish food supply by reducing waste. Here are three ways:

- **Halt** all discarding of fish, as countries like Norway and Namibia have done. The FAO estimates that this would save a total of over 20 million tons of fish each year, either to continue to grow and reproduce, or to provide much needed food.
- **Reduce** the amount of fish we feed to pigs, cows and chicken. Each year, up to 30 million tons of fish is reduced to meal and oil, and is used in the feeding of dairy animals and more expensive farmed fish.
- **Tackle** post-harvest spoilage and waste, chiefly in underdeveloped parts of the world where it averages over 20% of fish landed (5 to 10 million tons).

Social Impact

THE CONCENTRATION of control of ocean resources in fewer hands inflicts considerable economic and social impact on coastal communities. For many of these populations in poor countries, there are few income earning alternatives to fish. The result is stagnation in coastal towns and villages, and increased rural-urban drift of population.

The UN and its agencies encourages the award of property rights to indigenous communities who have fished local waters for centuries. The concept of "TURFS" – territorial user rights in fisheries – prevents (in principle, if not always in practice) encroachment by commercial fleets on inshore fishing grounds. The realization of TURFS type regimes in inshore waters also introduces a measure of conservation into local fishing practices.

In Europe and North America, coastal fishing communities are not afforded such protection, and scores of former thriving ports no longer have fishing fleets. One exception is regions where indigenous fishermen are of an ethnic group which has suffered from historical deprivation. So the Indian and Eskimo groups of Alaska and Canada, and the Maoris of New Zealand, have been given fish quotas in perpetuity or some similar guarantee of fishing rights. One might contrast treatment of these racial groups with that meted to the descendants of Celts in Ireland, the West of Scotland, and the Hebrides. Their land and income source was taken from them in brutal fashion after the failed Jacobite rebellions, and today the legal right to harvest fish in their local waters is being taken over by powerful groups in Europe as quotas and licenses are traded as commodities on an open market. This is a trade in peoples' jobs and in the economic base of scores of small communities.

Social Benefits

THE SOCIAL BENEFIT of a fishery can be determined by the jobs it creates and the serv-

ice industries it supports. In a poor country the local food it produces and the food security it affords are also critical. Looked at from this point of view it is obvious that the small-scale fisheries of the world are far more socially beneficial than the capital-intensive industries of much of the industrialized world.

- FAO estimates that the small-scale fisheries employ 12 million fishermen, 12 million fish sellers (mainly women) and six million fish curers or processors.
- The world's large-scale fisheries employ only from 0.5 to 1.0 million fishermen, depending on where you draw the line between them and the small boat fleets.
- The small-scale fishermen (marine and fresh water) produce around 33 million tons of fish a year, practically all of it for human consumption. Large-scale fisheries produce around 35 million tons of food fish plus another 29 million tons of fish for reduction to meal and oil.

Environmental Costs

THERE IS AN environmental cost to the type of technology used in fishing. The world's large-scale fleets consume over 18 million tons of fuel a year while the small-scale fleets use only 3 million tons. For every ton of fuel it consumes, the large-scale sector produces just over 3 tons of fish, compared with the small-scale sector's 10 tons.

Other environmental costs include the destruction of coral reefs by inappropriate fishing methods and the killing of thousands of tons of fish by "ghost nets" – lengths of drift net or gill net in the ocean, which have broken off from the huge fleets of nets operated by ocean going vessels.

Yet governments continue to bias legislation and fishing regulations to benefit the large-scale scale operator, whom they view as more efficient. "More efficient" can only mean that they concentrate profits and jobs in fewer hands.

Some economy of scale is needed in distant deep-water fisheries, but for most fishing

grounds within 200 miles of the home state a modest size of boat is feasible. In the few coastal fisheries where local fishermen have been given a management role (as in Japan), they regulate the type of gear that may be used and when boats may fish. This prevents a short-term "quick-buck" attitude, and it ensures, instead, a sustainable fishery and community for generations to come.

Remedies

MANY ATTEMPTS have been made to provide fresh directions for the world's fisheries and fishery managers.

- **UNCLOS**, the United Nations Conference on Law of the Sea, conferred ownership and fishing rights to sovereign states.
- **UNCED**, the UN environment conference, agreed that further measures are required.
- **FAO** has produced a "Code of Conduct for Responsible Fisheries" which has received broad approval.

Coastal fishermen in Spain recently produced the excellent *Cedeira Charter* which has a range of proposals to address current issues in fisheries management and exploitation. These include a halt to the capture of juvenile fish, regulation of the capture of adult fish, and the need to conserve the ecosystem. They demanded an end to over-exploitation, a reduction in fleet capacity, support for selective and environmentally-gentle technologies, and measures to ensure genuine compliance with new regulations.

Only massive and comprehensive efforts on this scale, plus similar measures to reduce pollution and protect the marine environment, will preserve the riches of our oceans for future generations.

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Culture beneath the high-tide mark

WHAT MAKES Monaco, the two square kilometres of land wedged between the French hills and the Mediterranean Sea, much more valuable than equivalent tracts further along the Riviera in the direction of France or Italy? Answer:

the tax regime, which lures millionaires to this intensively developed location

The principality has built as many skyscrapers as it can on to every available plot, and then burrowed down into the ground. But it has now turned the land beneath the sea into valuable real estate, by con-

structing what is in effect a giant concrete container with its foundation extending 30 metres below sea level.

Most of the Grimaldi Forum, an amphitheatre that accommodates 2,500 people, is beneath the sea. The extra-

ordinary costs of building a modern conference and exhibition facility beneath the high-tide line would be uneconomic practically anywhere else in the world. But in Monaco, because tax rates are low and land is scarce, rental values are high. That makes it economical to invest in the land beneath the sea.



■ Monaco's Grimaldi Forum