Fisheries management

Stealing the common

Fisheries management must take care not only of fish and the environment, but also fishing people and their material resources

I am very grateful to the organizing committee for inviting me all the way from Israel to talk about current developments in fisheries, from a fisherman's perspective. I'll try to do that and also ask some questions and raise some issues that are increasingly nagging my mind and, perhaps yours as well.

You'll excuse an old salt for sticking to the term fisherman. Having been a fisherman for a considerable part of my life and having to do with fishermen for the rest of it, I've a problem with becoming a 'harvester'. To me, these terms are not synonymous. Fishing is not just harvesting. It's an art and a way of life, and an ongoing, often violent and dangerous dispute with nature. Fishermen of both gender are a special brand of brave, intelligent individualists with, deny it or not, a romantic association with their boats, the sea and adventure, and who, incidentally, provide the world annually with around 90 million tonnes of fish and try to make a decent living doing it.

Nowadays fisheries are bogged down in an extremely complex and contradictory situation: there is increasing market demand, rising fish prices, and advanced technology, on the one hand, and restricted resources, some depleted, on the other, with fishery workers in the midst.

Let's take a look at the state of the world's fishery resources. Some are still underexploited, most are exploited close to the maximum, others are fully or even excessively exploited, and some overfished, with a few of them in a state of collapse. Whatever is the actual fishing power, marine fish landings remain fluctuating at between 80 million and 90 million tonnes annually. The prevailing mood, as expressed in the press and other media, is that of gloom.

However, is this mood justified? In a new analysis of a 45-year time-series (19501994), FAO indicates a possibility of a substantial increase of the total world marine fish landings. A growth, up to an additional third of the world's landings, seems possible by further development of the 40 per cent of underexploited stocks, mainly in the Pacific and Indian Oceans, and of mariculture (salmon excluded). An additional increase of around 10 per cent can be achieved by management. Such management was applied, for example, to the Northeast Arctic cod stock in the Norwegian and Barents Seas, or in the Philippines, Cyprus, and the Gulf of Castellamare in Sicily. All this is apart from the estimated 27 million tonnes of fish caught, but, for various reasons, either not landed, or just not reported.

Unfortunately, the Northwest Atlantic Ocean houses most of the stocks of bottom fish pronounced overexploited and that ocean, since the early 1970s, has been yielding, with some ups and downs, less and less catch. Environmental fluctuations or not, most of this decline must be ascribed to excessive fishing. How it happened, why it happened, and what to do to make sure it never happens again is a major issue. Marine fish resources are finite, but what's our knowledge about their limits?

Role of science

To discuss fishery management debacles, we must ask, among other questions, how stocks are affected by fishing effort and by environment. How scientific is the science used to determine desirable yields and / or effort, and how reliable are the assessment methods responsible for the answers we're getting? Whether the 'best available science' of today provides an adequate basis for rational management is hotly argued among fisheries scientists.

The traditional science is based on mathematical models of exploited fish populations developed decades ago. These models, along with acoustic surveys, are still the main pillars of wisdom on which fishery management is based.

We all know how difficult it is, in spite of the many theories, to forecast, not to speak of controlling, the workings of an economy. Even some economists admit that economic systems are rather chaotic and comprise many unpredictable variables. Ecosystems, fishery ecosystems included, are even more so. For, what is ecology if not 'economics of nature'? Take economics: the main economic units of exchange, which are money and its equivalents, are relatively few, and most of the participating factors and most of the rules that come with them are known.

In ecology, the business of energy and food exchange that goes on within every ecosystem is more complex and less known, and the rules and inter-relations between the various 'clients' and their surroundings not yet well defined, while the units of exchange are numerous, with prices' changing all the time.

Both economics and ecology are not exact sciences. The factor of human free will often assumes the role of the skunk in the garden party of economic models, and the various, mostly unpredictable, climatic fluctuations and other environmental changes upset results obtained by means of even the most elegant fish population dynamics models.

Still, these ate the sciences that are supposed to provide much of the wisdom for fisheries management decisions. Only too often we forget the rule that any scientific theory must be prone to be scientifically disproved. This rule applies also to fishery ecosystems.

Most models used by fishery biologists do not express environmental changes and fluctuations and their real-time effect on the abundance, natural mortality, availability, and vulnerability of fish populations. They use guessed and 'guesstimated' inputs, and mostly ignore climatic and hydrographic variables, and inter-relations with other species in the system. They may be relied on for some stocks existing under ecologically stable conditions and, with qualifications, for long-living species. Even more recent models designed to deal with multi-species fisheries are not the answer, because both intensive fishing and environmental factors, such as, for example, water temperature, often cause fast changes in the species composition, and, hence, in the whole ecosystem of such fisheries.

On the other side of the argument stands the so-called 'holistic' school of thought. It contends that a science that handles populations in separation from the system's physical parameters, on the one hand, and the given population's prey, predators and competitors, on the other, can not be relied on. Unfortunately, while the traditional models are relatively simple and do not involve too many variables and actual data, and can be solved using simple hardware and software, holistic models would be very difficult both to design and operate, and very complex in structure.

Such models would require an assessment of natural mortality and recruitment in real time, for each different environment. This would need plenty of knowledge on the effect of fishing effort and environmental conditions on various stocks, and a better understanding of the working inter-relations of the cogs of the ecological clockwork.

New supercomputers and software capabilities signal the evolving possibilities of integration of population models with environmental data and causation correlations. Until, however, enough time, money and research effort have been spent, applicable holistic models are not on the cards, and we are left with the unsolved issue of the inadequacy of conventional methodology.

Time lags

The problem of the adequacy of the science is topped with another one. There are time lags between several stages: data collection, analysis, reporting, discussions with decision makers, and the process of

having the management measures agreed on and implemented.

All this removes the reaction of the management system, often by a couple of years, from the processes occurring in real time in the fishery. Additional distortions may occur if scientists in charge of stock assessment, due to exerted or perceived pressure, are not telling the truth, only the truth, and nothing but the truth.

There is also the issue of our uncalled-for partners. The fishing industry used to be the main or only user and steward of marine fish resources, fishing grounds and the related environment. Not any more. The competition for resource allocation is growing, the new partners being the offshore oil industry, sport fishery, tourist arid recreational industry, and fish farming, as well as the municipal, industrial, and farming sectors that use the sea as their dumping ground.

Then, there are the 'green' organizations, and governmental and intergovernmental institutions that represent the general interests of society at large pertaining to the environment and the effects of human interventions on fish stocks and the rest of marine life systems. All this may be irritating, but can not be ignored.

One problem with some of the 'green' organizations is that they seem to sometimes confuse the conservation of a species and its population with that of individual animals, even after the endangered population recovers. Some go to the extreme by calling to reinstate the fishing grounds to their pristine, virgin state, forgetting that this can not be done without ceasing all fishing.

Then there is the issue of how recent developments affect fishery workers and their communities? Well, just look around. For example, in some areas, shifting fishing effort away from small-scale fisheries to factory ships able to move in international and 'chartered' national fishing grounds have led to dislocations (what a term!) not only of smaller fishing vessels and their crews, but also of fishworkers on land. Whole communities have been affected.

For example, depletion of certain major stocks have led to closures and 'buy-outs', with all sorts of socioeconomic consequences, including unemployment among fisherfolk. Also, introduction of transferable fishing quotas has led to amassing of fishing rights away from the smaller operators.

Third World

There is the plight of small-scale fishermen in the Third World, and perhaps anywhere else where small-scale operators have little access to information, credit, equipment, materials, and fuel

supplies, at prices and conditions available to larger-scale operators.

Therefore, many of them are bound to sell their catch to moneylenders, a practice that often results in unbelievable interest rates. The plight of these fishermen has often more to do with their socioeconomic and socio-cultural positions and political weakness than with the state of their resources.

They also suffer from large fishing vessels encroaching on their traditional fishing grounds. Sometimes, they fight back, and, recently, there were more rounds of this struggle in India, Indonesia and Chile. No doubt more people can make their living in small-scale fisheries out of the same resource, often at a lesser cost, than in larger-scale operations.

Governments that allow industrial, often extra-national, fleets into such fishing grounds, on the plea of often, dubious 'national' benefits or better economic performance, may be doing their countries more damage than good.

There is also the issue of technology. It is continually improving fish capture, navigation, fish handling and processing. But, with very few exceptions, it has failed to provide truly selective fishing gear. Selectivity through mesh size is proving ineffective.

A recent study has shown that a large proportion of undersized pelagic fish that escape through the meshes of a trawl die later on, of stress, of wounds incurred, or of loss of scales. Even gill-netting, for long considered a rather selective fishing method, may produce unacceptable amounts of fish and non-fish by-catch, as happens in tuna drift-nets.

Soon, with the increasing weight of environmental considerations, including by-catch, discards, overfishing, and creation of marine reserves in more and more countries, a lot is going to depend on technological and operational factors.

We have a fish-hungry market that controls not only the amount of fishing effort but also the target species this effort is directed at, and, thus, the gear and methods used. Its ever-increasing pressure spurs fishery industries to use ever-improving technology to catch and process more and more fish resources, some of which, like those in the North Atlantic, are exploited to their utmost.

We have socioeconomic problems due to pressures on the people who make their living out of fisheries. We have the problems caused by a fishery management which, again and again, proves unable to secure reasonable catch levels not only because it is based on inadequate fishery science, but also due to wrong choice of management measures, international and inter-sectoral bickering, a lack of political will and deficient administrative and enforcement capabilities.

It is ironic that where and when such political will appeared, accompanied by sufficient funding and enforcement it was usually after the stocks had already collapsed.

We have the ecological problem of man-made pollution that is overloading the seas with nutrients and poisons, causing havoc in marine ecosystems, and, here and there, outright poisoning of the sea, the fish and, eventually, consumers. And we have technologies that have been so busy enhancing effort that they now have a long way to go to tackle other problems.

We live in a free-market and free-enterprise economic system characterized by accelerating consumerism. Most of us seem to enjoy this system and hate political regimes that interfere with our liberal ways of trading, investing, making profits, employing people, etc.

The ideology of this system is that if some of us made good, everybody can and should. Some of us seem to be thinking that the rules of this catch-as-catch-can game are applicable everywhere, including management of fishery resources.

Points of view

This situation can be looked at from two points of view: a short- and a long-term. In the short term, both individual and corporate operators compete for what is

available and reap benefits as fast as possible. Some of them, such as highliners, may succeed. This approach fits in an expanding free-market, catch-as-catch-can economy which thrives on competition and on the freedom of its participants to chase profits as they see fit, within or without the law.

Right or wrong elsewhere, in fisheries this is wrong. Participants in worldwide economic competitions are struggling for shares in an ever-growing cake. Whatever is the potential of the capture-fishery cake, its fluctuating size is ultimately limited, and we all know how sensitive and vulnerable it is to concentrated, industrial pressure. We also know how, within a short time, this cake can shrink, especially where the cream and the raisins are.

The catch-as-catch-can approach is deadly to the long-term interests of fishing communities, the fishery industry and society at large, all of whom have vested interests not only in sustaining landings at reasonable levels, but also in distributing benefits to a maximum number of people.

To put all the things together into a system which would allow for a rational exploitation of marine fish resources and provide decent social and economic benefits to fishery workers and their communities, as well as to society at large, willy-nilly, we are back with the issue of fishery management. Although today's powerful vessels normally catch less fish per unit of effort than their much weaker, smaller and cheaper predecessors of some decades ago, international and local competition and market pressures, in combination with lopsided management steps, keep fuelling excess effort. The debacles of the Grand Banks and Georges Banks, on the one hand, and the Black Sea ecological disaster, on the other, caused governments and operators alike to start thinking about the need for good national and international fisheries and environmental management.

Rational management must be based on all we know of the given ecosystem and its effects on the fishery, and on an assessment of reasonable yield and/or effort. But an understanding of the workings of the fishery ecosystem is only one side of the management coin.

The other is good knowledge and consideration of the fishing population, markets, associated industry, enforcement capacity and political will in the managed area, and of the fishing people's attitudes and their possible reactions to various management options.

Frustrations

Management steps, even if based on the best calculated annual quotas or permissible fishing effort, will be useless if resisted by the fishing people. Haven't

they got, apart from legitimate opposition, 1001 ways of frustrating management steps that they consider unjust or unreasonable?

Some fishery ecosystems are affected by harmful pollution. The collapse of fisheries in the Black Sea is a quite terrible example of what pollution can do in semi-enclosed and enclosed marine basins. Thus, management of fish resources and management of the environment have become inseparable.

Some people, rather rightly, insist that management is meant to look after the best interests of society at large, not just the fishing communities *per se*. But this brings us to a political and socioeconomic issue as to what is best for the society at large and what is the importance of fishery workers and their communities within that society. There is also the political tension among the various fishing sectors which may lead to policy paralysis, and, consequently, disable the management.

The question arises, therefore, whether fishing people and the fishing industry should leave to others all fishery management initiatives and practices, with all the associated research, design of management schemes and their implementation. Should their attitude to management effort be to regard it only as a nuisance that has to be politically contained? Or, perhaps, self- and co-management in their various variants may form an effective attitude changer, so that fishing people respect management rules as they respect the marine 'rule of the road'; and governments recognize the advantages of community- and industry-inspired management and part with their absolute power of setting TACs, quotas and enforcement rules.

I believe that many small-scale and artisanal fishermen, especially the underfinanced ones, have also inherent self-regulating mechanisms preventing critical overexploitation of their resources. They flexibly shift fishing methods, fishing grounds and target species. Whenever catches or prices are low, they run out of working capital and cease fishing. Thus, effort is reduced and the stock 'rests'.

There are no such mechanisms among the often subsidized trawling and purse-seining fleets. They enjoy financing at normal interest rates and may go on exploiting coastal resources straight into bankruptcy, or fish out what is there and move elsewhere. Still, the local fishermen are blamed. As the old English rhyme goes:

They hang the man and flog the woman
That steal the goose from off the common,
But let the greater villain loose
That steals the common from the goose.

Fishery management is not only about the quantity of fish to be extracted or effort to be exerted. It determines, admittedly or not, the allocation of resources among the various sectors of the industry, and who and how many people are going to make their living out of the fishery. Politics? Yes, because management steps can only be selected according to policy objectives of the elected policymakers. The catalogue of possible management steps is quite large. One needs clear policy objectives to select rationally those that fit the particular local socio-cultural, economic, political, biological and physical situation.

Some people seem to be attracted to a single medication for all maladies. The fashionable one now is the famous Individual Transferable Quotas (ITQs) that one can purchase or win on auction from the government and then sell on the free market. Some of the thinking goes like this: excessive fishing effort keeps increasing because fish are a 'common property' and everybody is trying to increase their share of the cake.

This inevitably leads to 'tragedies': depletion of stocks and impoverishment of the fisherfolk. So, let's manage the stock by 'privatizing' the fishery. The highest private (or corporate) bidders would exploit the resource for their best financial profits. They can best take care of the goose and its golden eggs, and the best way to 'privatization' is through marketable quotas. Simple, isn't it? All the more so since such thinking is in line with the fashionable economic trend that everything that's private works better than anything that's public, and that the best decisions are taken according to the supply-and-demand game and the resulting profits.

Economic history, however, is full of examples of how resources that have become marketable have accumulated in fewer and fewer hands. I have little doubt that with marketable quotas and fishing rights sold to the highest bidder, sooner or later we will have Texas-size ranches and *latifundia* at sea. After some time, fishing people will get wise about what's going on. Then it won't help telling them that the great owner is extracting a higher economic rent than 1000 small owners could ever make, and that it serves the economy' (whatever that means) better. Tell that to the marines when they are called up to defend the ships and installations of the bigwigs. I'm afraid that fishermen don't believe in extracting economic rents. They believe in making a living.

This whole concept that fisheries management is about "how to extract maximum rent from the resource on a sustained basis" is justified by a presumption that any profits made are eventually recycled throughout society and everybody benefits. But how many countries can indeed boast of having the rent extracted from its resource by large-scale trawling fleets recycled in their own economy? And who can tell me where go the benefits extracted by a Panama-flagged vessel, owned by a multinational company registered wherever it is registered—Liberia? Cayman Islands? Ships like that are often manned by mixed Par Eastern and Southeast Asian crews, most of them severely underpaid and slaving under disagreeable working and living conditions. You let the owner buy a quota and here she comes flying a brand-new flag.

Unwieldy restrictions, privatization that dislocates fisherfolk, and inappropriate management systems can not be sustainable. Ever heard of prohibition? Ever heard about 'over-the-side' business of crews selling at sea by-catch and extra catch to traders and 'Klondikers'? Ever heard of people landing fish by swimming and pushing floated bags with fish? Ever heard how whitefish become 'blackfish'? With growing demand and all those redundant boats and people, the cost of enforcement will become prohibitive and the surveillance corruptible. Eventually, I'm afraid, some fisheries may become a mafia business.

Capitalism gone wild

All this is not against capitalism and free markets. It is against capitalism going wild. There is nothing holy about markets. Some markets are monsters—take drugs or guns—and you know what they do to society if they're left to go unbridled. Neither am I against quotas, transferable or not. My point is that they may fit some

but not other places and situations. Their application must be locally examined. I'm sure, for example, that for fishing off the Antarctic continent, ITQs would be an appropriate management tool,

Take the 'open access' issue. It is claimed that a fishery that's free for all and exploited on a 'catch-as-catch-can' basis is on a sure path to overfishing. Where, for example, thousands of artisanal fishermen are employing canoes, *kattumarams*, *jangadas* and other small fishing craft from open beaches, access can not be practically limited and catch quotas of any sort can not be enforced.

Under such conditions, to avert the infamous 'tragedy of the commons, it is the effort that should be limited. Limiting days at sea, closed seasons, short working weeks, etc., if worked out in a way that does not affect the operational efficiency or increase operational costs, and is agreed on with the fisherfolk, can best be enforced by themselves. To keep fishing power from otherwise expanding, fishing time limitation might be accompanied by limiting also the number, size and power of the fishing craft.

Thus, quotas and privatization are inappropriate where resources are exploited by thousands of small-scale fishermen and the derived benefits widely distributed. On the other hand, ITQs may fit well in areas not accessible to small-scale operators or where fishing populations are too small. What's just fine for one place may be totally wrong for another.

Limiting access and effort control are only too often disregarded, though they may be quite efficient, especially in co-management schemes.

As I sum it all up, wrong or right, if fishery is about people producing food out of fish stocks, fishery resources are the resources of fish, people and their means of production. If so, fishery management must take care not only of fish and their environment, but also of the fishing people and their material resources.

Also, I think that the management of fisheries can not be handled right if it selects its measures by only market and the so-called 'economic efficiency' criteria, and trifles with the resulting social and political price?

Maybe the people whose only criteria are dollar profits, and who don't want or don't know how to put a dollar figure to the social price of their favourite solutions, should change their criteria. Most people agree now that for the protection of our environment, economic / financial criteria are insufficient. Aren't fishing people and their communities a part of the environment, like redwoods, dolphins and rhinos?

Still, on the world's scale, fishery remains relatively manageable. The situation of the air we breathe, the ozone layer, sea and groundwater pollution, the greenhouse effect, forest devastation, and our own spermatozoa is much worse. Life on our planet will not be ruined by overfishing, bad as it may be, but by overpopulation and pollution.

Options for action

Fishery workers have options for action. They can independently assess governments' and scientists' recommendations. They can initiate and participate in co-management schemes. They can insist on management solutions for preserving fishing communities. They can initiate and participate in anti-pollution activities. They can support selective technologies. And they can organize for joint and international activities.

This was the keynote lecture delivered by fisheries consultant Menakhem Ben-Yami at the St. John's Conference of Harvesters in the North Atlantic Fisheries