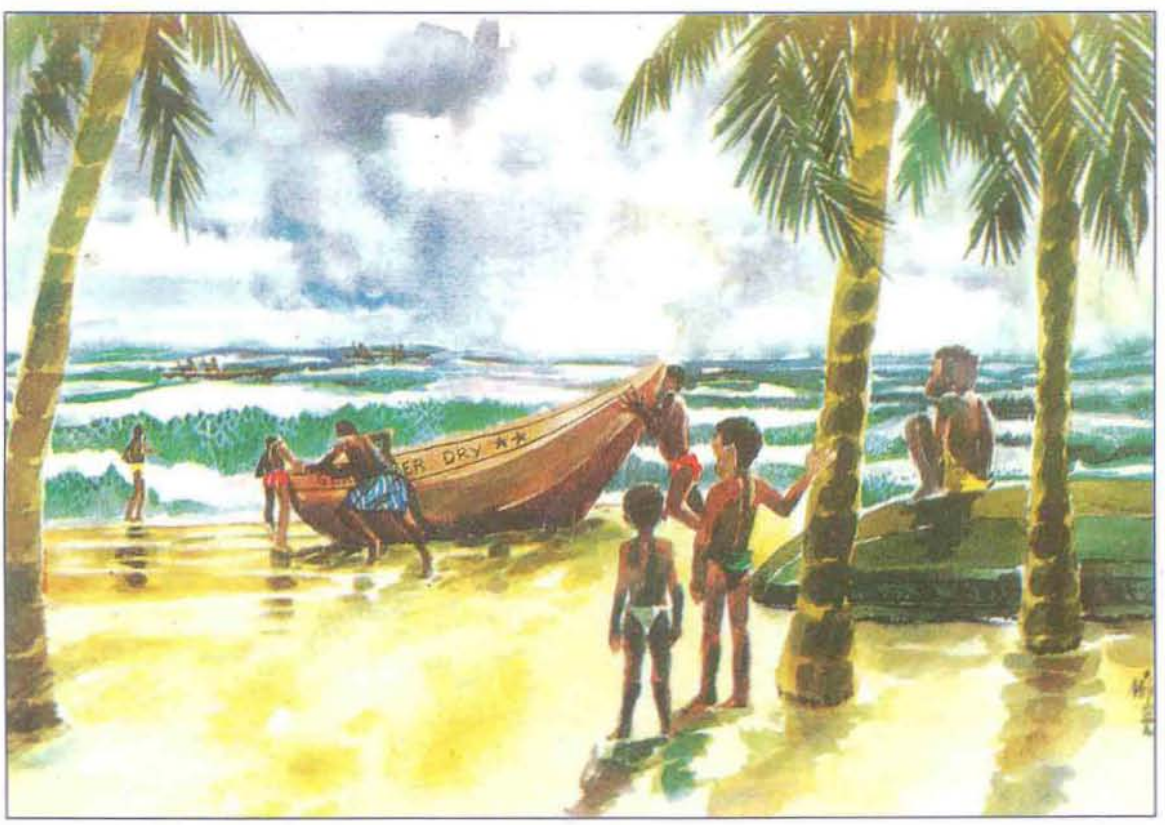
No. 20 May 1998

SAMUDRA REPORT

INTERNATIONAL COLLECTIVE IN SUPPORT OF FISHWORKERS



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Comment

Shades of trade

No one can deny the importance of trade in fisheries. About a third of global fish production enters international trade. In value terms, this amounts to US$52 billion. According to the FAO, the developing countries increased their share of international trade in fish and fish products from 44 per cent in 1985 to 46 per cent in 1995. In the same decade, the share of low-income food-deficit countries (LIFDCs) rose from 14 per cent to 19 per cent. The 1996 Report of the WTO Committee on Trade and Environment recognizes the developmental and environmental benefits of trade liberalization, including wiping out restrictions and distortions like tariff barriers and subsidies. This could lead to a more efficient allocation and use of resources.

The fisheries sector is often cited as an exemplary beneficiary of trade liberalization. Take the case of several African countries faced with high tariff barriers. If there were no such barriers, greater intra-regional trade could take place. This, in addition to reducing pressures on national waters, would also create new employment opportunities. Or consider the import of processed fish into the European Union (EU) and US, especially from developing countries. A tariff cut will not only promote exports but could also provide more jobs in several developing countries.

The question of trade also throws up the issue of subsidies. It is generally argued that subsidies to fisheries encourage capital to move into a sector that is already overcapitalized. They promote overfishing and represent a misallocation of government financial resources. While this criticism is valid for the fisheries of developed countries, especially in the case of the distant-water fleet of the EU, it can not be applied to developing countries for several reasons.

First, it assumes that subsidies in fisheries go primarily to harvesting and not to the processing or marketing sectors. This may be true in many developed countries, but preliminary evidence and field-level impressions suggest that this is not so in developing countries. Second, the argument also presumes that fish stocks are generally depleted. While this may globally be true, in several countries, especially in the Indian Ocean region, resources may not be overfished. There are other compelling reasons to retain subsidies in fisheries. In capture fisheries, subsidies may be needed to force fishers to shift to more resource-friendly harvesting methods. Subsidies may also help develop the fisheries of certain underexploited stocks and thus relieve pressure on other overexploited stocks. Further, certain social situations, like civil war (as in Mozambique) or famine (as in Senegal), may warrant subsidies, to help coastal populations overcome unexpected vagaries.

Available evidence from different parts of the world, like Thailand, Senegal, South Africa and Ghana, suggests that most subsidies to the harvesting sector in developing countries go to large-scale fleets that would be rendered economically unviable without this crutch. By facilitating competition for space and resources, these subsidies thus pose an unfair threat to the artisanal sector.

The operations of subsidized distant-water fleets in third countries affect the resources of developing countries, and also distort trade. In Mauritania, for example, the operations of foreign vessels fishing under fisheries agreements have overfished cephalopod stocks. They also deprive the highly efficient domestic fleet, which uses primarily artisanal techniques.

Many artisanal fisheries in the tropical belt depend on shrimp production. In this sector, they face competition not only from destructive trawling operations but also from brackishwater aquaculture operations. Many of the costs of shrimp aquaculture operations are borne by society, and amount to hidden subsidies to the aquaculture industry. These hidden subsidies help the aquaculture industry to sell shrimp at a cheaper price in the international market. This discriminates against artisanal fishers, who use passive and environment-friendly techniques.

Without efficient and purposive fisheries management programmes, it would be quite meaningless to leave fish mainly to the dynamics of trade. In countries with poor fisheries management policies and programmes, perhaps the only way to protect the right to life and livelihood of economically disadvantaged coastal communities is to place some restrictions on trade, until a proper management system is put into effect.

Fisheries Agreement

Squawking like a wild fowl

In effect Argentina's Fisheries Agreement with the European Union subsidizes the collapse of Argentinean fisheries

In January this year, *Industrias Pesquerast*, a specialized fishing journal in Spanish, carried an article on Argentina's new Federal Fisheries Law. Its headline warned: "Argentina is Nationalizing its Fisheries." It went on to say that the new law would change the legal framework of the Fisheries Agreement with the European Union (EU).

The article demanded that both political and economic pressure be applied on the Argentine government to uphold the agreement. It also pointed out that 700 Spanish jobs and the profitability of boats operating in the Southwest Atlantic were at risk.

My first reaction to this article was one of surprise and shock. I wondered whether the reins of power had been seized by nationalistic forces while I had been on holiday. But no, this was not the case: I bought several papers and magazines to check the news and assure myself that we still had the same government and that the economy was still pursuing the same neoliberal course.

But then I remembered that our new Fisheries Law, which was approved in November 1977 and ratified last January, and which had been severely criticised for its shortcomings (see SAMUDRA Report No. 19), had feebly tried to address a number of abuses and introduce some changes in their place.

Last November, an important movement of fishermen, workers from the shore-based plants, and small fishery entrepreneurs succeeded in making some improvements to the preliminary draft of the Fisheries Law, so that when it was finally approved, it ruled that 75 per cent of the crew working on boats flying the Argentine flag had to be either Argentine nationals or residents. It also prohibited the transfer of quotas (in the new system) from fresh-fish vessels (national) to freezer vessels (mostly foreign, although flying the Argentine flag).

But, most importantly, they succeeded in wresting a slight increase in the number of years for which catches would be counted in allocating vessel quotas. These were set at eight years, up to December 1996. To a certain degree, this has helped to iron out the distortions produced by the dramatic increases in freezer vessels in the last four years, thanks to the vessels coming in through the Fisheries Agreement with the EU.

Under the Fisheries Law, quotas will be allocated depending on how much national employment is generated and how much investment is made in the country. Besides, the Spanish also need to understand that their behaviour of under-reporting catches over many years—some 300 tonnes per vessel on an average—has resulted in them now being allocated some 1,500 tonnes per vessel. This seriously jeopardizes the profitability of their fishing operations. As we say in Spanish, "Go and cry to the Church, dear sirs"

Spanish boats

Until 1986, no more than 20 freezer trawlers were catching the hubbsi hake (our main fishery resource) in Argentine waters. Yet, in that year, taking into account Uruguayan and Argentine catches (around 390,000 tonnes), INIDEP (the National Institute for Fishery Research) reported that the resource was fully exploited. However, the Argentine authorities continued to allow the entry of these boats, mostly of Spanish origin. By 1989, there were at least 40. In 1993, the year before the agreement with the EU

came into force, the number of freezer trawlers had increased to 65, with reported catches of 495,000 tonnes (including 70,000 tonnes by Uruguay); that is to say, 27 per cent of the resource had been overfished.

Last year, the number of these vessels catching hubbsi hake had risen to around 100 (22 through fisheries agreements), with reported catches of around 650,000 tonnes, including those from Uruguay. This meant that 67 per cent of the resource had been overfished.

The question arises: When the agreement was signed in 1992 allocating them a quota of 120,000 tonnes, did the European experts and negotiators ignore the fact that the hubbsi hake was already overexploited?

So great is the present crisis that we no longer crack many Spanish jokes, as they have backfired on us. Before the Agreement, most of the companies operating in Argentina were Spanish, they knew about the state of the fishing grounds, and they received heavy subsidies to come and fish here (see box on Pescanova).

It could be argued that the Agreement intended to replace existing boats with new boats of an equal fishing capacity. But, how would this equal capacity be measured? The argument is itself self-deluding: boats with a capacity to catch and process 10,000-12,000 tonnes annually have had transferred to them licences to catch and process around 2,500-4,000 tonnes annually. Without any controls, who could possibly believe that these quotas would be adhered to? This only increased overfishing.

In the very act of its signing, the Agreement asserted in Article 3 that "the Parties shall co-operate to promote the conservation and rational exploitation of fish stocks on a sustainable basis, in accordance with the relevant provisions of the United Nations Convention on the Law of the Sea."

Could it be that it was thought that the entire fishery could be taken over, and all the Argentine fishworkers pushed out? Or perhaps, the new law almost innocently changed the plans to destroy yet another of the world's fishing grounds, by preventing the acquisition of quotas from the fresh-fishing fleet?

But does the new law alter the legal framework of the Agreement? To start with, the Agreement (and the subsidized fleet invasion prior to the Agreement) alters the biological framework of the Agreement. The spawning stock biomass of the hubbsi hake has been reduced to such low levels that INIDEP researchers estimate that a total allowable catch (TAC) of 80,000 tonnes is needed to provide the stock with a 95 per cent chance of recovery.

However, given the catastrophic socioeconomic consequences of such a low level, the Fisheries Secretariat has set a politically more acceptable TAC of 30,000 tonnes for this year. This gives the stock a 40 per cent chance of recovery.

But at this level of fishing, there will be a loss this year of around 30 per cent of fishery-dependent work places in our country. Will the EU support these 3,000 (or more) workers? And what about the Argentine companies that will be pushed to the wall?

Such a level of fishing will increase pressure on coastal, pelagic and deep-water resources beyond sustainable limits. Will the EU help reduce this pressure which threatens us with a general fishery collapse?

It would seem that such a scenario is dealt with in Article 9 of the Agreement: "If, as a result of a change in fish populations, the Argentine enforcement authority decides to adopt new conservation measures affecting the fishing activities of vessels fishing under this Agreement, discussions shall be held between the Parties with a view to amending the Annexes and Protocol I hereto and maintaining the general balance of the Agreement".

Collapsing fishery

Surely Europe or Spain will not continue trying to catch 120,000 (or more) tonnes of hake when the fishery is collapsing. Or will they? But, according to this Article, "Conservation measures adopted by the

Argentine enforcement authority shall be applied in a non-discriminatory manner to all vessels..."

Industrias Pesqueras accuses the Argentinean government and the Fisheries Law of applying "discriminatory measures". The existing regulations are, to a certain extent, discriminatory. For example, there is a 100-mm mesh size allowed for trawls towed from the side, and 120-mm for trawls towed from the stern.

The law states that catch quotas can not be transferred from fresh- to frozen-fish vessels. In this sense, the 20 or so Argentine freezer trawlers are equally "discriminated" against.

As regards work places, we are not aware of any other foreign business activities, which have brought their own labour forces with them to operate in Argentina. For example, it seems ridiculous that McCain, a company recently established here, has brought 150 Canadians to Balcarce.

However, it seems that we have to tolerate this at sea, for vessels which have adopted our flag and which, moreover, must abide by our laws. Why? Surely, it is Spain which should change its custom of exporting its fisheries workforce to countries which are less experienced and aware.

Article 5, Clause 3 of the Agreement states, "As part of its policy for the restructuring of its fleet, the Community shall facilitate the inclusion of Community vessels in undertakings established or to be established in Argentina. To that end, and as part of its policy for the technical renovation of its fishing industry, Argentina shall facilitate the transfer of current fishing licences and issue the appropriate new licences pursuant to this Agreement."

The EU's policy for the restructuring of its fleet is very clear. And, no doubt, the Agreement has contributed to the success of this policy. Through it, financial support has been provided to its boatowners to set themselves up here.

No modernization

What we have not fully understood until now is how has Argentina benefited from the "technical renovation of its fishing industry"? According to a very interesting piece of work carried out by Roberto Dula for the Argentine Centre of High Seas Captains, the average age of the freezer trawler fleet is 13-17 years, while the fresh-fish fleet is aged between 14 and 18 years. Therefore, even from a simple perspective, there has been no such 'renovation' or 'modernization'.

Rather, there has been a covert importation of second-hand vessels at highly subsidized prices, affecting the

Pescanova power

Pescanova, the world's largest multinational fish processing company, operates in Argentina under the names of Argenova and Pesquera Andina. Founded in 1960 and based in Vigo. Pescanova introduced onboard fish freezing to Spain. Today, it is the world's largest multinational company catching and processing fish. It owns the world's largest private fishing fleet; more than 140 vessels operated by 60 companies in over 20 different countries. In 1993, it made profits of around 2,000 million pesetas (US$ 13 million). Of its equity, 37 per cent is controlled by the Fernandez-Souza family, and the South African conglomerate, Barlow Rand, owns a further 20 per cent.

Controlling more than 13 per cent of the market for frozen fish and about 40 per cent of the market for processed fish products, Pescanova is Spain's most important freezing firm. It enjoys a 40 per cent share of the market for fishery products and boasts a competitive edge over rival fishing companies by maintaining a presence on fishing grounds worldwide. It is assured of increasingly scarce raw material supplies through its long-standing policy establishing joint ventures in countries with rich fishing grounds. Thus the group controls organizations in Argentina (where Argenova operates 15 freezer trawlers out of Port Deseado in Patagonia), Australia, Chile, Scotland, Spain, France, Equatorial Guinea, Ireland, Italy, Falkland Islands, Mozambique, Namibia, New Zealand, Portugal, South Africa, San Pierre-and Miquelon (Canada) and Uruguay. This enables Pescanova to corner 20 per cent of the world catch of hake.

The success of Pescanova has only been possible Thanks to the generous subsidies it has received from the Regional Council of Gallicia, the Spanish Government and the EU.

In 1992, a year in which the company suffered severely from the crash in hake prices, it received US$ 9 million worth of subsidies from these three sources, at a time when its profits were only US$ 3.3 million, that is to say, the subsidies received were thrice its profits. Most of these were invested in the construction of new vessels.

Pescanova's policy for expansion has been responsible for debts totalling over US$ 265 million at the beginning of 1993. It was only an increase in the capital provided by the Regional Council of Gallicia that saved the firm from being bought up by the multinational, Unilever.

—This piece has been translated from material submitted by Ernesto Godelman

development of the Argentine marine industry, while allowing the Spanish boatyards to continue building boats, in the meantime, also with the help of subsidies.

A case in point is that of the vessel *Mar del Cabo*, a 76-in trawler, constructed in 1964 by Astilleros Barrera of Spain, brought in to catch a quota of 4,614 tonnes of a surplus species (i.e. not hake). Another argument used to justify the signing of the Agreement in Argentina is that better access for our fisheries products has been secured to the European market, thanks to a reduction in tariffs from 15 per cent to 5 per cent. Although, significantly, highly processed fishery products remain excluded from this reduction, the benefit is conditional on Argentina fulfilling the catch quotas allocated to Europe.

In 1994, Europe, with tariff rates of 15 per cent, was already taking half of Argentina's fish exports. It sounds strange to claim that if we give our clients direct access to catch the resources, they will increase their purchases of fishery products. Statistics show that, while exports have increased, Argentine companies have lost clients and unit prices for fishery products have reduced, something which is bound to happen when one buys from oneself. On the other hand, within the framework of GATT and WTO, Europe has ended up providing the same reduced tariffs to the rest- of the world.

Alarm bells

The boss of European fisheries, Emma Bonino, along with her Euro-Hispanic deputy, has sounded the alarm bell because the Argentine fishery law proposes to introduce conservation measures for straddling stocks and highly migratory stocks outside of the EEZ. Frightened by the Canadian ghost of the

turbot war, Bonino has acted not unlike one of our local wild fowls, named *tent* This interesting bird from the pampas, lays its eggs in one place but gives an alarm call from another to distract predators. Canone seriously imagine that, on the high seas, Argentine patrol ships will use force to capture European fishing boats in international waters?

Evidently, within the framework of the New York Agreement on Straddling Stocks and Highly Migratory Stocks, Argentina is allowed to intervene in the regulation of waters adjacent to its EEZ, seeking to establish agreements with third countries to ensure the - rational management of its resources and associated food chain. This is the spirit of the law.

But, worried by the imminent breakdown of the irresponsible second-generation fishery agreement with Argentina, Bonino is squawking from the other side.

On 6 November, Argentina will decide whether or not to reject these fishery agreements. Whatever the outcome, institutionally, the agreement with the EU has completed a process of irresponsibly increasing fishing pressure, where subsidized European boatowners and the Argentine government have both contributed to reducing our main fishery resource to a state of collapse. The least that can be said is that the world's greatest fishing power has acted in a highly irresponsible manner by placing such high expectations on exploiting an already overfished species through this fisheries agreement.

Taking into account all its shortcomings, the new Argentine fisheries law, to a certain extent, at least, makes an attempt to correct these abuses and the damage they have caused to our fishing grounds. However, the spokespersons for European fisheries (including Emma Bonino) have only shown, us their worst sides. With friends like these, who needs enemies?

This article by Ernesto Godelman, Chairman, CeDePesca, Mar del Plata, has been translated by Brian O'Riordan of Intermediate Technology

Padaido Islands

Paradise in peril

Threatened by a dwindling fishery, the Biak people of Indonesia's Padaido Islands are trying to cash in on their fishing culture

In the village of Pasi in the Padaido Islands of Biak, Irian Jaya, virtually everyone is a fisher. Male or female, young or old, people's thoughts turn naturally to the sea. Their songs and dances are celebrations of the beauty and bounty of nature. Their native language is replete with descriptors for the many moods and depths of the sea, the variety of reefs, the shapes of corals and the myriad reef fishes. From the high forest called Mbrur down to Sorenberamen, the deep blue sea, the Biak people have names for each of what modern science would call the island's ecozones.

The traditional fishing territory of Pasi includes unpopulated islands to the east and south. To these islands go the men, women and small children, carried in dugout outrigger canoes called *perahu*, to harvest fish and shell fish. Using hand-lines, spears and gill-nets, they catch a bewildering array of multi-coloured fish: perhaps 25 different species in a day, and, in one week, over a hundred.

We know this because the artisanal fishers of Pasi have staffed to record the names and sizes of the fish they catch so that they can monitor both their economic progress and the health of the resource they depend upon. They have good reason for such care and concerns, for their livelihoods are under threat.

In eastern Indonesia, the vast majority of fishers fish from hand-made perahus to feed their families and catch fish for the local market. However, an increasingly large proportion of the total fish catch is being harvested by huge commercial fishing boats owned by powerful urban capitalists. Time, and the monitoring data being collected by Pasi villagers, will tell what the long-term impact of rapidly escalating industrial fishing will be on the coastal communities of the Padaido Islands.

Another worry is that the number of small boats is also increasing, but the fishing grounds are not. Young men from fishing families now often leave the village to look for work in urban centres, while women are left behind in charge of growing families.

For women of fishing families, life is a relentless cycle of work and more work. Their fishery is in shallow waters where, at low tide, they glean shellfish and crabs. They work neck-deep in water, using hand-made wooden goggles to spot the elusive shells on the bottom, tipping their harvest into the small *perahus* that float beside them. The catch is taken to shore where it is boiled. The meat is extracted and threaded on slivers of palm frond, then dried and smoked over an open fire.

Fish are also smoked, then packed into handsome baskets, *kanyuwer,* sewn together from the rich red bark of a tropical tree. The women make the baskets, collect the firewood, and also tend the gardens and process the main cash crop, coconuts, to produce cooking oil.

The gardens are small clearings slashed out of the forest where root vegetables, coconut and banana trees are grown. Not much else can grow here, for the sparse grey soil barely covers the coral rubble and gleaming white limestone core of the island.

Forest resources

The forest provides wild greens, medicinal plants and the materials to make woven baskets and hats. All these are gathered and processed by women,

whose only rest comes on Sunday-the day set aside in each of these deeply religious communities for prayer and reflection.

As electricity is introduced to the villages so is demand for modern consumer goods. Traditional baskets are replaced with brightly coloured plastic ones. Fishing families need more money, and, therefore, must travel to farther reefs and try to catch more fish-but there are limits.

The reefs are not as productive as they once were. The fishers say that the fish must be smarter than they used to be; the older men can remember when the fishing was easy. Overfishing is a difficult problem with many social and economic complexities.

Even more distressing is that there are many areas where the reefs are dead: smashed with dynamite or poisoned with cyanide. These modern 'fishing technologies' are used when the demands of the modern consumer culture outstrip the ability of hand-line and spear to provide cash. Not just fish but corals and all other animals, and sometimes the fishermen themselves, are maimed or killed in the process.

The problem of destructive fishing in Padaido mirrors a larger problem across Indonesia. This country is the world's centre for coral reef biodiversity but already, according to recent surveys, the majority of reefs have been damaged or totally destroyed and less than 10 per cent are in pristine condition. Fishing communities in Padaido, under the leadership of their church and environmental organizations, have set up a reporting system, and now actively discourage the use of bombs and poisons in the fishery. However, theirs is a difficult battle and they need support from higher levels of government to enforce bans on destructive gears. Indonesia's waters are large, and the enforcement capacity very limited. To make things worse, the source of ammunition for blast fishing is sometimes the Indonesian military! Now, with the monetary crisis adding to the pressures at all levels, protection of fisheries resources has become even more difficult.

Learning to monitor

With the help of a local environmental organization, *Yayasan Rumsram*, and with seed money from an international agency, the Biodiversity Conservation Network, Padaido Islanders are learning how to monitor the health of their coral reefs, and planning new economic development. They know that the possibilities for expanding their fishing effort are limited. They have made start by building fish aggregating devices so that they can catch pelagic as well as reef species. However, their main *hope* for the future lies with ecotourism.

The fishers want tourists to come to their villages, to listen to their songs and stories, to admire their stunning beaches and coral reefs, to taste fresh fish and lobster, to buy their baskets and learn about their traditional medicines. They know that this must be a locally owned and controlled effort; otherwise they will simply become museum pieces, objectified by urban tour operators who will move tourists through to look at them and then return to the city. The people are not interested in being passive displays. They want tourists to stay and spend their money in the villages.

Families are building small bungalows where guests can stay overnight. The women are preparing themselves to cook special traditional foods for their visitors. They are practising their songs and dances so that they can be performed on demand. And, most importantly, they are saving up their money and learning how to work together with people in other villages to develop a small travel bureau which will market their product. They want their children to learn English so that they can tell tourists about their history, culture and coral reefs.

The way ahead will not be easy. As with the fishery, there is heavy competition in the tourism industry from the industrial sector. Already a five-star hotel has encroached on Saba village territory and the hotel's waste water pipe has been placed in the mangrove forest, feeding a stream that leads to the beach where the village children swim.

The hotel owners, who live in a distant urban centre, arc hungry for more land to use for waste disposal and want increased access to local fresh water supplies. They also want to build a marina over the magnificent Saba reef-one of the few in Padaido that can boast almost 100 per cent cover of healthy living corals. The villagers are determined that this will not happen. Fortunately for them, the local government in Biak is also determined to protect the rights of local people as they deal with such wealthy investors.

However, at the national level, the area has been declared a national marine tourism area. *What* this will mean for traditional tenure, particularly of the uninhabited islands in the Padaido archipelago which support the artisanal fishery, is as yet unclear.

It is clear, though, that Biak, and, indeed, all of Indonesia, need competent management institutions for fisheries and coastal development. The rights of the many indigenous people also need formal protection. Some NGOs and law activists, supported largely by foreign funders and working together with sympathetic government staff as well as academics, are currently trying to move Indonesia towards a form of fisheries co-management in which small fishing communities will have a formal and respected place at the table.

It is to be hoped that these efforts will soon bear fruit, before what remains of Indonesia's rich biological and cultural heritage is lost to destructive fishing, mass tourism and ill-regulated industrial development.

This report has been filed from Indonesia by Irene Novaczek

Community rights

Local knowledge power

A workshop in March led to a declaration on community rights and access to biological resources in Africa

The task force of the Scientific, Technical and Research Commission of the Organization of African Unity (OAU/STRC) on community rights and access to biological resources met in Addis Ababa *from* 20 to 23 March 1998. The objective of the meeting was to develop a draft model legislation on community rights and access to biological resources to ensure the continuing control by local communities of their natural resources, knowledge and technologies, as well as to develop a draft African Convention on the same.

After national review and discussions, the model legislation would be expected to form the basis for African nations to develop national legislation on community rights and access to biological resources, community knowledge and technologies. It is expected that an African convention would create coherence among the different pieces of national legislation.

Natural resources and indigenous knowledge and technologies are a legacy humanity owes to local communities. The task force understood a local community as a section of society in a given area whose means of livelihood are based on the natural resources, knowledge and technologies of, and related to, its immediate ecosystems.The local community keeps adapting, generating and regenerating those natural resources, knowledge and technologies as its preceding generations had done and, if spared disruption by external forces, as its succeeding generations will do.

The essential role of the community in the conservation of biological diversity, on which the very survival of planet earth is dependent, is recognized by the Convention on Biological Diversity (CBD), created by a large part of humanity, represented by 150 states, in 1992.

A smaller part of humanity, represented by 40 states, concluded the negotiations for the creation of the World Trade Organization (WTO) in 1994. The objectives of win are global and concern the movement of goods and services throughout the world to ease international trade.

It is the conviction of the task force that the WTO-based approach is predatory in nature and runs counter to the aspirations (It communities which are closely linked to the biodiversity so necessary for the survival of the planet. The task force believes that the privatization of life forms through any intellectual property rights (IPR) regime violates the basic right to life.

The task force, therefore, strongly recommends that OAU/AEC member states urgently make legislation to regulate access to biological resources, knowledge and technologies so that such access shall be allowed only with the prior informed consent of the local communities and the state, and shall benefit them, and to recognize community rights in order to protect the heritage of the people of Africa. The task force commits itself to the achievement of the noble objectives of this proposed legislation and this draft convention on community rights and access to biological resources.

This piece is based on a posting by Kristin Dawkins of the Institute for Agriculture and Trade Policy, Minneapolis, US, on the Fishfolk mailing list.

Marine reserves

The future reserved?

The experience of New Zealand seems to suggest marine reserves as a proactive solution to the crisis in the world's oceans

Marine reserves are probably the most proactive means of countering the present crisis in the world's oceans. In that part of the globe where the hemisphere is centred on New Zealand, 90 per cent is ocean and the marine ecosystems there are isolated from humans. They should, therefore, be less affected by exploitation and pollution than those of most other countries. New Zealand should thus be the ideal test case for marine reserves.

Under New Zealand's Marine Reserves Act, such reserves are set aside primarily for scientific purposes. The need for increased scientific understanding is very clear, as threats to the ocean from both natural and human sources are blatantly obvious.

As the worst El Niño since 1983 reverses the normal climatic patterns in the South Pacific, dramatic die-offs of marine mammals, penguin, fish and seabird kills, toxic algal blooms and red tides are hitting New Zealand waters with unexpected severity. Such impacts threaten fisheries, economics and equanimity. They demonstrate just how little of the complex dynamics of marine ecosystems and their living species is known.

In the sub-Antarctic Auckland Islands, more than 1300 pups of the endangered Hookers sea lions have died for reasons scientists have as yet been unable to determine. With a population of under 15,000, Hookers are the rarest and most isolated of sea lions in the world. Campaigning in recent years by conservationists, concerned that the numbers of adults drowning in the nets of the squid fishery could lead to extinction, led to the Ministry of Fisheries setting a quota on the number that could be killed before the fishery was closed. This quota, like a stock assessment, is an estimate of the sustainable mortality derived from the biological parameters, and the numbers killed on vessels, Ministry of Fisheries observers extrapolated over the whole fleet. Last year, the figure was more than 100 females, already much greater than the agreed quota before intensive lobbying led to the Minister closing the fishery. Yet, even before this year's fishing season had begun properly, it was estimated that more than this number of breeding adults had already died at sea from this mysterious illness. The consequences of further human impact could be serious.

On the mainland, following numerous complaints of human acute respiratory irritation, there have been official warnings to keep people off two popular beaches. In another outbreak in Wellington, a university marine scientist found that all marine life in the harbour had been killed and that the city could only wait for a change of weather to disperse the toxin involved.

Around the coast, there have been numerous closures of beaches, marine farms or specified lengths of coastline for shellfish harvesting as a result of monitoring toxic blooms in the north, there have even been dramatic red tides off local beaches. This is the first time since the unprecedented crisis in 1992-93 that there have been reports of such widespread and intensive impacts. If nothing else, it raises questions about how much we know about the dynamics of the marine ecosystems.

Unusual events

Although so many unusual events have occurred this summer, the fact that they have occurred in many different bodies of

water separated by features such as the Southern Convergence means that the search for causal factors must be sought in features that encompass the wider area.

Generally, threats from pollution and overexploitation of the world's oceans are increasing. If these major impacts can be removed from specific special and representative ecosystems, allowing them to regenerate to [heir previous, natural state, and providing them as control groups, it could lead to better knowledge.

Such areas of marine reserve are a small but vital contribution to the protection of the seas. Marine ecosystems are complex and diverse and, with the difficulties of monitoring within a fluid medium, we know comparatively less about them than about terrestrial systems. Scientists typically use control groups in order to remove the effects of as many variables as possible and marine reserves are seen as appropriate for this purpose.

By preventing the removal of fish, seaweeds, shellfish and other living organisms, it is believed they may revert to a more natural state and, therefore, allow for both better understanding and the regeneration of fish populations. Marine reserves are of value not only for scientists but have social values and benefits for education, recreation, management baselines, conservation and as a source of pleasure for nature enthusiasts. Indeed, in those reserves established long ago, the spectacular volume and diversity of fish that so excited the early European explorers to New Zealand can again he seen, while newer destinations are showing signs of reverting to this state. With 'spillover' and increased larval export from expanding species populations, practical benefits also flow beyond the designated areas to the environment and those who depend on it. Many species and the products of spawning do not recognize gazetted boundaries but rather, as the pots of lobster fishermen surrounding some reserves testify, become distributed widely and contribute economically to these and other stakeholders.

There are now 14 such reserves sprinkled around New Zealand: Cape Rodney-Okakari Point (the Leigh Marine Reserve and the first established), the Kermadec Islands (the largest marine reserve in the world), Poor Knight Islands, Whanganui A Hei, Tuhua (Mayor Island), Kapiti Island, Long Island, Kokomahua, Tunga Island, Piopiotahi (Milfurd Sound), Te Awaatu Channel (The Gut)-these latter two are both in Fiord land, following application made by the Federation of Commercial Fishermen-Westhaven (Te Tai Tapu) and, more recently, Pollen Island and Long Bay, established under the Marine Reserves Act. In addition, but under different legislation, there are two

Marine Parks, Tawharanui and Mimiwhatangata, and the Sugar Loaf Islands Marine Protected Area. Applicants have included university marine scientists, Maori groups, community groups, the Federation of Commercial Fishermen, the Department of Conservation, and conservation groups.

These are generally no-take areas for scientific purposes under the Marine Reserves Act, but their establishment was often motivated by a desire to conserve representative areas of the sea, its habitats and species-places where people can visit and see fish and marine life as they used to be. Overseas, it is recognized that "New Zealand's marine reserves provide an international model for the protection of critical marine reserves around the globe," as Groundswell reported in *A Newsletter on Marine Reserves.*

In reality, as yet, only a tiny four per cent of the territorial sea (out to 12 nautical miles) is protected and, without the Kermadec Reserve, there would be less than one per cent in marine reserves. The immediate target is an area of 10 per cent. On land, the need for conservation is well recognized and almost a third of New Zealand is protected in national parks and reserves. Even this does not seem to be enough to preserve the uniqueness of New Zealand's landscape. Marine ecosystems are even more complex and so the issue is more urgent.

New Zealanders like to fish and gather food from the sea both commercially and privately, so virtually the entire coastline is, or has, until very recently, been exploited-so setting tip reserves is controversial. Yet divers have testified to the sometimes spectacular recovery of marine life within the reserves. Some, like Leigh just north of Auckland, have become major attractions, where people can see dramatic schools of fish by just paddling into the water.

Such benefits are becoming widely recognized and scientific research has endorsed them by showing an unexpectedly large increase in fish-there are now 20 times more rock lobster, and 12 times more snapper in the reserve than outside. If marine reserves can contribute positively toward regenerating local areas, then, in order to be effective nationally, a network of biogeographically and ecologically representative reserves is required. This should include all types, from those on exposed, hard coasts to the soft estuarine mudflats, mangroves and wetlands.

In the Hauraki Gulf, just outside Auckland and adjacent to the region of greatest population in New Zealand, efforts are under way, in terms of both theory and implementation, to define a network. Scientists have used both physical and biological criteria to define principles, so that selected areas would include both representative and unique marine ecology. To explain the principles, Professor Bill Ballantine, a marine scientist and leading proponent, uses the analogy of a trawl net. just as the meshes are largest at the mouth and reduce in size at the cod end, where the quantity of fish will he the densest, marine reserves offshore need to be greater but further apart and, inshore, where habitats and species are both denser and more diverse, the reserves should reduce to smaller size but increase in number.

More significantly, for specific stakeholders, Ballantine has shown that if one area has a higher priority for one group, then, provided a neighbouring area also meeting the principles is available, it will serve the purposes of a network just as well.

In the Hauraki Gulf, there are now around eight marine reserves or special ecological areas gazetted, with a further eight in fairly advance stage of the application process. As yet, in only two widely separated pairs are the reserves close enough for natural biological linkages to occur obviously. Nevertheless, it would need only another eight reserves before the anticipated synergistic interactions between them could reasonably be expected to provide an effective network.

Deep water resources

Not all ecological nor biogeographical types, however, are represented, particularly in offshore areas. Despite knowledge of New Zealand's deepwater fishery resources, efforts to set aside

examples of the habitats and ecology that support them have yet to advance beyond the thinking stage.

In Australia, however, scientists, and others working on orange roughy, through their research, management and conservation organizations, have ensured that at least a few of the known deep-water sea mounts and their diverse benthic (bottom-dwelling communities) remain unfished in an interim reserve.

White conservationists see reserves as a proactive means of countering the present crisis in the global fisheries, the issue is more controversial for other stakeholders. The sub-Antarctic, where pleas have been made for a 100-km exclusion zone around the Auckland Islands to protect the foraging grounds of the endangered Hookers sea lions, is one example.

Species ignored in one culture may he highly prized in another and thus offer lucrative markets. In the past, New Zealanders had no commercial interest in squid, but that is by no means the case now as industry has expanded to meet those demands or even create others. Despite management efforts, some stocks are reducing and effort is shifting to other species. As the companies fishing on the apparently dwindling stocks of orange roughy are increasingly marketing the once-despised oreo dories, so many of the same companies working the deep-water squid fishery arc askance at any suggestion of exclusion from the now lucrative Squid fishery. Even the offshore areas seem to be fully exploited.

In most coastal waters, not only is it more necessary to set aside marine reserves but it is also more difficult without encroaching on jobs and livelihoods. The fishing industry has supported marine reserves in theory, and even applied successfully for a couple, hut, in practice, it has opposed most applications. Nevertheless, through consultation and negotiation, there is hope that sufficient reserves will be designated anti that fishermen who will be hardest hit in the short run will be the recipients of the greater benefits from more prolific stocks in the longer term.

As the older reserves regenerate closer to their unexploited state and as the newer reserves begin the process of forming a network, our understanding of their species, dynamics and inter-relationships increases in detail. We begin to accumulate the knowledge and skills necessary to counter the many and diverse threats to the ocean,

Complex fisheries

Whether the same reasoning and processes that auger well for New Zealand can be applied to the even more biologically and socially complex fisheries n the tropical developing world is an issue for investigation by those who use them or know them best. As just a tentative suggestion, perhaps communities could set aside spawning and nursery areas as a tithe—certainly an immediate sacrifice, but one offering potential benefit in the longer term over a much wider area.

This article has been written by Leith Duncan, an environmental fisheries consultant based in New Zealand

Fisheries management

No to quotas, yes to licences

Linking the licence to fish to individual vessels of specified capacity could help to sustain the European Union's inshore fisheries

Britain, once described as an island of coal surrounded by fish, has, in recent years, seen both its fishing and mining industries decimated. In the 1980s, the Conservative government under Margaret Thatcher effectively dismantled Britain's mining industry-a traditional and historic sector which supported thousands of livelihoods and scores of communities.

In the 1990s, the fishing industry in the UK faces similar prospects. The decline can be traced back over several decades. In 1938, there were 38,000 full-time fishermen in the UK; today, there are 14,000. Fish stocks, taken as a whole, are lower than they have ever been. One way out of the crisis would be to do away with quotas and, instead, develop and introduce a new system of licences.

Those opposed to UK membership of the European Union (EU) have taken up the cause of British fishermen with gusto. According to them, the Common Fisheries Policy has handed 'our' fish to greedy and rapacious European fishing fleets. Honest British fishermen are the only ones to abide by t he rules, and are being squeezed out of the industry. While our boats are being burned by order of Brussels, Spanish vessels are lining up to fish right up to British beaches.

The truth is a little different. Mismanagement of the UK industry for 20 years has seen an unnecessary decline in both employment and fish stocks. By accepting the pain of cuts in vessel numbers several years ago, countries such as Spain are now taking advantage of restructuring funds denied to the UK because we failed to implement similar policies at the same time. The Common Fisheries Policy has undoubtedly failed in many respects, and requires substantial revision, but it is not the cause of all our ills.

You do not need to look too deeply at the fishing industry to realize that a select bunch of people are making vast sums of money very quickly. Every week, the fishing press contains announcements about another multimillion pound vessel leaving a boatyard with ever more sophisticated electronic gadgetry designed to find fish faster and more efficiently. These vessels need to land ever larger amounts of fish to pay for bank loans, expenses and the deposits for the next, larger, vessel that will be ordered in three years time.

This fish can come in two ways—it can be 'bought' from other fishermen, or the fish can be landed illegally. It is no longer a secret that in some ports on the northern edges of Britain, over 40 per cent of landings are those of the latter category. These so-called 'black fish' find their way down to larger processors in England. causing a drop in auction prices. Fishermen in smaller boats, unable to catch more to compensate for the drop in price, are the inevitable losers in the game, along with the fish themselves.

While some people seem to be finding ways to turn the Common Fisheries Policy to their benefit, by fair means or foul, many fishermen in the small boats sector find themselves losing out.

Fishery closed

For example, last December, the UK Ministry of Agriculture, Fisheries and Food (MAFF) calculated that the UK quota of English Channel plaice had been taken, and ordered the fishery closed. The quota was for vessels under 33 feet, which, up to 1 January, had to throw back any plaice they caught (as by-catch).

For the small beach boats that rely on this stock, such as the historic fleet at Hastings, it was not a good Christmas. The fleet is already in decline and, at best,' marginally viable. The sad thing is that the demise of these small beach boats has a minimal effect on the stocks of fish that are most affected by a fewer number of much larger offshore vessels. The result of the current system of managing our fish stocks is that fishermen are being reduced faster than the stock of fish.

A review of the Common Fisheries Policy has to be undertaken by the end of 2001, and many of the current derogations to the open-access principle (such as the 6- and 12-mile limits) will be evaluated. It is likely that this review will recommend some fundamental changes (and these derogations may be lifted).

Already, the debate has started on what changes should be made to it. The European Commission is at present consulting stakeholders, and it is to be hoped that those representing smaller vessels will make their views known and be listened to. My own view is that the quota system should be scrapped.

It has failed to protect stocks, has alienated fishermen, reduced the accuracy of research and disrupted markets. Politicians like quotas as they are an easy way of maintaining national shares of a stock, but politicians do not rely on fishing for their livelihoods.

A licensing scheme, weighted to take account of local priorities, could be devised to be phased in as the CIT is renewed. This would use market forces to ensure both commercial and biological success of stocks, could largely eliminate any threat to the industry from the environmental movement, and would halt the decline in employment that the fishing industry has suffered over the last 50 years.

The present licensing system, whereby licences with no legal value are being traded at ever more exorbitant prices, is concentrating quota and tonnage in a diminishing number of hands. Rule breakers, be they 'blacking' fish or under-reporting engine capacity, can afford to pay the highest prices for further licences, increasing pressure on those operating within the system.

Expanded capacity

The smaller vessels that do least damage to stocks and employ two-thirds of the UK's fishermen, suffer when quotas are reduced because of the antics of these larger vessels that have expanded their catching capacity. A case in point is the South West Hand-line Fishermen's Association (SWHFA), an association of some 500 fishermen operating smallboats in the inshore mackerel fishery around

Devon and Cornwall. Their quota for 1997 was so small that the fishery was closed early when they had used up all their quota. Thanks to quota transfers from the large pelagic sector, members of the SWHFA were able to continue fishing until the end of the year.

How, then, would charges for licences reverse the decline in employment and stocks, and restore a measure of profitability to the hardest pressed segments of our fleet? A new system could be introduced which would allocate the right to fish to a specific vessel and gear combination. Skippers would apply for an entitlement to fish with a particular vessel, specifying the types and the specifications of the gear to be used, hold capacities, horsepower, etc. An entitlement to fish within a certain fishery would then be provided, and the licences would only allow a fixed quantum of effort for the named vessel.

Easily managed and enforced catches within this restriction would be unlimited. Permission would be required before fitting updated equipment that increased catching capacity in any way. The absurdity of the closure of the Cornish hand-line fishery or the under-10 m plaice and sole fisheries would never again be seen.

The removal of the common right to fish should mean that those no longer allowed to fish should be entitled, via some form of government or management body, to pay for the privilege to enter a restricted fishery. The money obtained should be used not only to contribute towards the cost of management arid enforcement, but should go into the coastal communities historically dependent on the stock. This could be used for compensation, job creation or training for those choosing to leave the fishery.

Once priorities for a local fishery are decided, licence costs could be weighted to reflect the effect of a particular vessel on that fishery. A longliner, for example, capable of landing. 100 tonnes of top-quality fish, with zero discards and by-catch, would pay significantly less than a trawler with the same catching capability. A beam trawler using twice as much fuel per tonne of fish landed, as well as destroying the seabed and employing fewer fishermen, would have to pay correspondingly more. Once the system had been established, the greatest bugbear of our industry—quotas—could be abolished. Policing would still be required, of course, to stop abuses of the system such as has taken place with the 'de-rated' engines in sectors at the larger end of the fleet, but overall costs of enforcement would be greatly reduced.

Without quotas, there would be no reason to cheat on logbooks; the number of fisheries officers required would be reduced and the statistics that the scientists use would become much more reliable.

It is inevitable that a great deal of rationalization would occur in any fishery subject to such a system. This could be catered for. Those who had spent large amounts of money on the open market investing in quota or licences would need compensation; an effective capacity reduction programme that could not subsequently be overtaken by technology would be required if effort control was to be avoided. Owners would still be able to upgrade their vessels, but their licence charge would be increased to reflect the extra profitability they could expect to achieve.

Such a scheme would inevitably lead to an outcry, which would have to be addressed by phasing in licence fees gradually, and by announcing details of the scheme several years in advance. Once in place, charging structures could be set so that market forces gradually caused vessels to change to low-impact, high-employment methods of fishing.

Large, highly efficient vessels would remain in areas such as North Norway and Rockall, but there would be a market force in favour of a shift towards more traditional fishing practices elsewhere. The days of owners using 'black fish' money to pay for larger vessels, which, in turn, need ever larger amounts of 'black fish' to sustain them, would be over.

Patent failure

One reason for the patent failure of the attempts to manage our fisheries has been

the lack of support, or outright hostility, of fishermen themselves.

As it became evident that licence charges would allow the majority of vessels to become more profitable, support of the majority of thinking and honest fishermen would make it a simple matter to isolate those breaking the rules.

Those caught would not be able to renew their licences. Once it became clear that in a depleted fishery, effort control would be introduced, it would be in the interests of all those in the fishery to bring to heel those responsible for the depletion.

Government, unshackled from costly enforcement of quota restrictions, could place on vessels a greater number of observers who, concerned only with compliance with technical measures, would be free to collect more, and better quality, data on which to base further, better-informed management decisions.

Our industry is at a crossroads. In the lead up to 2002, we have a choice—carry on with a system that will make millionaires of a few and paupers of many, or have the guts to go for a system that will maintain the diversity of fisheries that sustain our coastal communities.

This piece, based on an article that first appeared in *Fishing News* in February 1998, is by Andy Read, who was Assistant Chief Executive of the National Federation of Fishermen's Organizations during 1996-97. The views expressed in this article are entirely personal.

Social history

Making ends meet

During the 1920s and 1930s, fishing played a major role in the work and social life of Val Comeau, an Acadian village

The 1920s and 1930s are now sufficiently distant in time to be fading from living memory and moving into history books. This article is one part of that transition. It describes life during the inter-war period in the small village of Val Comeau, as remembered by a handful of village elders and their children.

That memory speaks of hardship, but also of a time when an abundant environment provided the villagers with the resources to have large families and a vibrant social life. Theirs was a way of life far removed from the alienating offices and suburbs of modern North America. Work consisted of a multiplicity of activities which varied according to season, depended on the abundant resources of the ocean, forests, and land around Val Comeau, and were organized socially by household, gender and class.

The village of Val Comeau is on Canada's Atlantic coast, looking out from its north-eastern New Brunswick shore across the icy Gulf of Saint Lawrence towards Newfoundland, 400 km distant. It straddles a small peninsula, a kilometre wide at its base and 5 km long, cutting between the ocean and Tracadie Bay.

From its founding, the settlement has followed two roads, one, which traverses the base of the peninsula and the other which cuts northward up its centre. In the 1920s and 1930s, the houses were placed at the roadside, while expanses of pasture and vegetable gardens were cut out of the forest behind them.

The small fishing dories of the community and its merchants were pulled up above the high-water mark on the beach beneath the lobster canning factory of the merchant house, WS Loggie.

The people of Val Comeau are known as Acadians. They are descendants of some of the earliest European settlers to North America, coming from France in the 17th and early 18th centuries. The Acadians settled in what is now known as Nova Scotia, hundreds of kilometres south of the main area of French settlement in Quebec. They rapidly developed a pattern of farming and a cultural tradition distinct from their northern brethren.

In 1755, they were forcibly deported from their homeland by the English during the war for Canada, a war in which the English eventually triumphed over the French.

After years of being scattered around the British and French colonies that fringed the Atlantic, some Acadians made their way back to Canada's eastern seaboard.

As their lands had been colonized by a wave of Scottish and English immigrants, the Acadians were compelled to move to other areas of the east coast. An important destination was the northern and eastern coasts of New Brunswick, areas far removed from the major centres of English Canada. Val Comeau and its larger neighbour, Tracadie, were probably founded at the end of the 18th century by this wave of Acadian refugees.

By the 1920s, Val Comeau was a well established village with around 200 residents and branches of two merchant fishing companies. Household and class were the primary social divisions within the village. The most important and most evident form was the household.

Family ties

The family bonds within the household served to organize most aspects of life. Social and economic responsibilities in the

household were organized along gender and age lines.

Adults were most directly concerned with production, while the old and young helped where they could. At a broader level of class differentiation, there were two groups: the three or four large landholding households and the poorer villagers with only small plots. The former were descendants of the initial settlers of Val Comeau who had managed to preserve the land parcels that their ancestors had received from the Canadian government as settler grants. The remaining villagers were either post-land grant immigrants or those who had lost their lands.

All households possessed enough land for a garden large enough to provide vegetables for the long winter, but only the large landholders could make farming their principal occupation. They were in a position to hire the poorer villagers to assist them during planting and harvesting.

A third, non-resident, group was also vitally important for the village: the merchants. Both the merchant companies in Val Comeau were from English-speaking areas of New Brunswick. WL Loggie was the major player in Val Comeau, specializing in lobster fishing and canning, for which it had boats and a factory in the village. A & R Loggie fished salmon, for which it hired a number of men to work on its dories. A & R also had storage sheds at Val Comeau for its equipment.

For the villagers of Val Comeau, the merchants were the primary link to the world economy. Their shops in Val Comeau and fracadie stocked goods basic to the lives of Val Comeau's residents, but which were in short supply or unavailable locally. From their shelves could be procured everything from wheat flour, salt and lard to cotton thread, fishing supplies, and cast iron wood burning stoves. To gain access to the goods, the villagers needed cash, a primary source of which was the merchant companies themselves. The latter hired the men and women of Val Comeau to fish for them and work in their factories.

In many parts of Atlantic Canada, fishers and their families were bound to merchants through a system of debt relations. A weaker version of this system prevailed in Val Comeau. The merchants were the principal source of the industrially produced goods which made life more comfortable.

Credit availability

As these goods were available on credit redeemable against labour for the merchants, the latter were able to assure themselves of a regular labour supply. Two factors, however, limited the

merchant power to control the workforce of Val Comeau.

First, the villagers had access to an abundant environment which gave them a subsistence base other than the merchant stores. Second, by the 1920s, the growing Canadian economy provided alternative sources of employment in New Brunswick and beyond.

Work in Val Comeau was directly structured by the year's four seasons. Late spring, summer and early fall, from the beginning of May to late September, was the crucial period of the year for subsistence. During that time, sufficient stores had to be accumulated so that the household could survive the harsh winter. For the large landholders, this meant planting and tending their crops of wheat, oats, buckwheat, potatoes and vegetables.

For the rest of Val Comeau's residents, this meant different tasks for men and women. Most of the men worked on the merchant boats fishing principally for lobster, cod, mackerel, salmon and herring. Around four or five men owned their own small boats from which they caught their own lobster and other fish. In both cases, the men ensured that they salted or pickled sufficient fish for the needs of their households throughout the winter. Other fish did not require a boat: eels, trout, salmon, and gaspareau were fished from the rivers, while clams were available in great quantities at low tide. As their men were away at sea much of the time, the women of Val Comeau had the primary role in tending the family vegetable plots and caring for the few animals that they might have. Cabbages, potatoes, beans, turnips and carrots were the principal crops. They were stored through the winter in root cellars dug into the ground behind the house.

Late summer was a busy period for the household. At the end of August, many families decamped *en masse* to blueberry fields in the interior where they picked blueberries at a penny a pound for farmers or merchants. In September, the harvest had to be brought in rapidly to escape the first frost.

At the end of the month, the men stopped fishing in order to cut firewood for the winter heating and cooking needs. They generally exchanged salted fish for firewood at the rate of one 200-lb barrel per 20 cartloads. September and October were also the best times for hunting moose and deer, which were a welcome addition to the winter stores. Rabbits, ducks and. geese were also hunted at this time and through the winter.

Merchant boats

A few men of Val Comeau continued to work on the merchant boats through the

fall, but most departed for New Brunswick's extensive forests where they were employed by timber companies through to the following April. Trees were felled through the late fall and winter, until the spring thaw in late March or early April and then rafted down the rivers swollen with the run-off of melting snow. Those men who remained in Val Comeau through the winter engaged in hunting and smelt fishing through holes carved into the ice on the Tracadie river, or in the small bays down the coast from the village.

As men's work took them away from the house for extended periods, women had a critical role in assuring the vitality of the household. They were the caretakers of the household, stitching clothes, ensuring that the winter stores were sufficient, preparing meals, caring for children, and cleaning. At the same time, they played a central role on the family farm and engaged in wage labour when it was available. Many women, especially those not yet married, worked in the Loggie factories canning lobster, cleaning fish or cooking for the employees of WS Loggie who lived in the village.

Softening the challenge of deriving a living in the harsh climate of northern New Brunswick were the numerous social activities of the villagers. In that pre-television era, entertainment was a family and community affair. Its primary site was the kitchen of the house. After a copious meal of boiled fish, potatoes and molasses-based desserts, family and neighbours sat around the wood stove listening to legends, singing, playing instruments and joking. The major festival of the year was the Mi-Careme, towards the end of winter, where a masked gang of men went from house to house in the village hooting, banging, scaring small children, and telling tall tales about the residents of each house they visited. Attendance at the Sunday mass in Tracadie also provided a chance for socializing, as did frequent shopping trips to the larger centre.

It would be misleading to say that Val Comeau in the 1920s and 1930s was a fishing village. Fishing was just one, though perhaps the major, economic activity of the village. Val Comeau's most important economic characteristic was the diversity of its economic base which depended on three rich ecological zones: the ocean, the forest and the land. From these, the residents of Val Comeau met their own direct subsistence needs and earned the cash with which they could access industrially produced goods. The diversity of Val Comeau's economy and the adaptability of its residents provided security in a beautiful but unforgiving environment.

This piece by Derek Johnson draws on data collected during the course of his work for an M.A. thesis

Shrimp aquaculture

Mangroves make way

The Tanzanian government has given the nod to the Rufiji Delta shrimp project

The Tanzanian government has decided to give the green signal to the proposed large-scale shrimp farm venture in the Rufiji Delta. According to information reaching the Mangrove Action Project (MAP) from a correspondent in Tanzania some time ago, "The government here is in favour of the Rufiji Delta prawn project though most of the NGOs and some government conservation organizations and even the Fisheries Department are against it. This is in addition to several villagers in Rufiji Delta who do not want this project. In any case, the whole project has moved beyond scientific facts to politics. Official approval may be announced any time."

That approval was finally announced recently and many industry spokespersons from near and far seem to be speaking of this event as if it were a major victory for the aquaculture industry. Yoshi Hirono, a shrimp farming consultant and general manager of the African Fishing Company's shrimp farming project in Tanzania, reported, "On 19 November, the cabinet of the Tanzanian government met and unanimously voted to support the Integrated Prawn Project without any conditions except the monitoring program organized by the environmental gurus. The Integrated Prawn Project was approved to develop 6,000 hectares of ponds and a hatchery on Bwejuu Island, as described in the Environmental Impact Assessment."

"We did what it took to convey to the relevant ministries that sustainable prawn aquaculture could be undertaken in Tanzania," he continued. "The Government of Tanzania was set back by malicious critics from environmental organizations and some NGOs. In spite of strong opposition from the donor countries against our project, the government made a historical but wise and gutsy decision."

Supposedly, all that remains flow for final approval is an 'official' letter of the decision to approve the project by the cabinet from the Minister of Natural Resources and Tourism before proceeding with further surveys and investigations.

Those opposed to this project are by no means resigned to just let things happen as industry wants. According to Paul Nnyiti of the Wildlife and Conservation Society of Tanzania, there is still much more that can be done: "The way I see it, we may end up appealing to the world to help put out facts on the destructiveness of the project in order for the government to change its present stand on this huge project. Alternatively, we have to work with the Director of Forests, who is in charge of mangroves, to prohibit the project."

Networking tour

One of the regions that a team from MAP plans to visit during a proposed networking tour of East Africa next February is the Rufiji Delta. MAP will then be able to report in more detail about these developments and the counter-strategies that are being proposed by the local NGOs and communities living in the region.

This piece is based on the website of the Mangrove Action Project

All together

As the experiences from Mozambique show, fisheries management regimes and institutional arrangements can work

Due to financial problems and the lack of marine / biological investigation, very little is known about the potential of marine resources accessible to artisanal fisheries in Mozambique. Furthermore, systems to monitor and evaluate the fisheries, to assess the stocks and impact of fishing effort, are weak. Since Mozambique's independence in 1975, the control of fishing activities in the small-scale fishery became the responsibility of the *Administraco Maritima*-ADMAR.

During the 1980s, the strategy for developing small-scale fisheries in Mozambique was based on the *Combinados Pesqueiros*, a quasi-government company that supplied fishing inputs and services to artisanal fishermen and marketed their surplus production. In 1987, Mozambique launched a Structural Adjustment Programme (SAP) and started a new process that tried to create more incentives and facilities to enhance the role of the private sector in the development of the national economy. As a result, a privatization process of the Combinados' assets and activities began.

The institutional set-up of the fisheries sector changed after the SAP and the Institute for Small Scale Fisheries Development (IDPPE) came into existence, with the responsibility to promote small-scale fisheries development in Mozambique.

As part of global political changes, a new structure for the fisheries administration was established in 1994. The institutions of the Ministry of Agriculture and Fisheries (MAP) involved in fisheries management (and which advises and gives recommendations to the MAP), are the following:

- *Direcco Nacional da Pesca* (DNP), dealing with legal aspects, mostly dealing with industrial fisheries;
- IDPPE, whose objectives are to improve knowledge about small-scale fisheries and identify development programmes;
- IIP, for biological research on the resource;
- The *Servicos Provinciais de Administraco Pesqueira* (SPAP), the state institutions in charge of monitoring and control at the provincial level, in co-ordination with the *Administraco Maritima* which is the only institution with actual field representation in all the coastal districts.

The Fisheries Master Plan approved by the Mozambique government in October 1994 sets the priorities and strategies of development to be pursued in the next years. In relation to management of small-scale fisheries, the Master Plan emphasizes the involvement of fishermen in setting up and enforcing the management regimes.

The implementation strategy towards promoting co-management arrangements implies that the first step should be to research the existing management regimes, focusing on the traditional systems in place to manage the fishery. In this respect, baseline data, as well as biological, socioeconomic, technological and other information, must be collected.

Management committee

From 1 January 1997, the *Regulamento de Pesca Maritima* came into force. This regulation sets forward a fisheries management committee, *Comisso de*

Administraco Pesqueira (CAP) that includes fishermen representatives from artisanal as well as semi-industrial and industrial sectors.

This committee is an advisory body that will meet four times a year to recommend management measures for the national fisheries.

The CAP has an advisory role to the Minister of Agriculture and Fisheries, dealing with conservation, fisheries management and regulation.

More specifically, it focuses on determining:

- fisheries quotas;
- fishing closure periods;
- maximum number of licences for the various fisheries;
- value of fisheries licences; and
- definition of protected areas.

Although many issues still need to be addressed regarding the functioning of the CAP, and the legal and institutional aspects of co-management, the committee provides a framework for further development of co-management arrangements in Mozambique.

The small-scale fishery in the Angoche and Moma districts, in Mozambique's northern province of Nampula, is characterized by a low diversity of fishing techniques, with seven per cent of the fishing units using beach seines. Drift gill-nets and hand-lines are also used.

The fleet is almost totally non-motorized, paddles and sails being the normal ways of propulsion. This high concentration of beach seines, often made of small-mesh nets, leads to an intensive exploitation of coastal fish stocks.

An artisanal fisheries survey, carried out by IDPPE in 1994, recorded a total number of 1,460 boats and 12,160 fishermen for the two districts. The area is characterized by a very high concentration of fishermen, with an average of one beach seine every 140 m of coast and around 90 fishermen per km. The breakdown of fishing units by fishing gear used is as follows:

Type of gear	Share (%)
Beach Seines	71.2
Gill-net	17.5
Hand-lines	10.4

The fishery is based on exploitation of small pelagics, mostly from the *Clupeidae* and *Engraulidae* families, and, to a lesser extent, higher-value demersals. Drying and salting-drying are the most common fish processing methods in the area and seem to be quite appropriate, given the lack of cold storage facilities and the low purchasing power of the inland populations. Smoking is less developed and the market for the product is mostly in the more coastal part of the province. There is a relatively small market for good quality fresh fish in Nampula.

With support from the International Fund for Agricultural Development (IFAD) and the OPEC Fund for International Development, the Institute for Small-scale Fisheries Development in Mozambique (IDPPE) has been implementing, since 1995, a six-year project in the area. The project was established with the overall objective of improving the level of income, employment and food security of about 9,300 fishermen and their families living in the two districts. This objective was sought to be achieved through integrated interventions in the following areas:

- artisanal fisheries development;
- establishment of financial services; and
- institutional strengthening.

Under the artisanal fisheries component, several activities were foreseen. The knowledge of fisheries resource accessible to small-scale fisheries in Mozambique is very limited.

No reliable data

The only studies done till recently focused on the stocks exploited by industrial and semi-industrial fleets and there was no

reliable data on small-scale fisheries production. The need to emphasize the study and management of the fish resource appeared clear.

A programme to improve the knowledge of fisheries resources exploited by artisanal fishermen in the project area was initiated in 1996. The core of the programme consisted of a catch assessment survey. The system was designed by IIP (the Fisheries Research Institute) with some technical assistance from the Norwegian government aid agency, NORAD. Implementation occurs in close collaboration between IIP and IDPPE. Data collection is done by the project extension workers. Complementary biological studies, on some of the main commercial species, have just been initiated, in collaboration with the Faculty of Science of the Eduardo Mondlane University.

Some other activities under the fisheries development component are aimed at supporting the diversification of fishing techniques and practices, and promoting co-management initiatives to allow for better and sustainable use of the resources.

Experimental fishing activities also began in 1996 and are focused on fishing trials of different types of gears, e.g. improved drifting gill-nets for small pelagics, various types of longlines, improved bottom-set gill-nets for medium- and large-size fish, fish aggregating devices (FADs) and improved beach seines. The experimental fishing takes place with an improved sailing boat provided by the project and also based on agreements with interested fishermen.

At the time of the project start-up, there was virtually no management of the artisanal fisheries in Mozambique. Aware of this situation, and of the lack of financial means to implement more classical fisheries regulation mechanisms, the government decided to encourage the development of co-management systems. This policy was made official in the Fisheries Master Plan.

The activities of this component of the project started with the undertaking of a study under an ICLARM/North Sea Centre-supported programme, to assess traditional fisheries management practices in the project area and the potential to promote fisheries co-management there. The main conclusion was that the situation seemed to be favourable to develop schemes that would involve fishermen and administration in managing fisheries resources. The main recommendations for short-term action were:

- the creation of local co-management committees composed of representatives of the

administration and fishermen, where fishery regulation issues would be discussed and actions to be taken agreed upon, on a consensual basis; and

- implementation of a mechanism to control access to fishery resources in the project area.

Following this, an informal co-management committee comprising representatives of ADMAR, IDPPE, IIP and fishermen, has met a few times in Angoche.

During these meetings, issues were raised in relation to the need to control fishermen and the shrimp industrial trawlers, and the use of mosquito nets at the cod end on beach seines.

Project technical staff (including a team of 10 fishery extension workers) has been working to sensitize fishermen on the need to preserve fish resources. Study tours for fishermen and representatives of the fisheries administration have been organized to Inhassoro and Malawi to build awareness on the key issues of resource management and the need to develop participatory fisheries management schemes, A training course covering basic theoretical concepts arid practical experiences on fisheries co-management has been organized in Angoche, for IDPPE extension workers and fishermen representatives. These activities have contributed towards the establishment of co-management systems in Moma and Angoche. In addition to the co-management committee, local fisheries management committees (similar to the Beach Village Committees in Malawi) have been created. During the last few months, structures of this type have been made official in three fishing centres. The fishermen of Quelelene Island have been playing a leading role in this process.

The control of access to fishing ground appeal-s to be the key issue in the implementation of co-management systems. Fishermen of Quelelene Island *proposed* to restrict the access to their area to fishermen registered in the island. They would themselves compromise by not going fishing in other areas.

After some discussions with the project team and ADMAR, this decision, on an experimental basis, for one year, was made official through a note from ADMAR in September 1997. To date, the measure has been respected by the majority of fishermen. Another key issue to be addressed is the stabilization of the number of beach seines operating in the project area. A significant reduction is unlikely to happen in the short term.

Regulatory measures

Although there are regulatory measures on minimum mesh size for the beach

seines, enforcement is quite non-existent and, had there been any, it would have had profound social consequences.

The project is working on a proposal to amend current regulations for minimum mesh size for beach seines from 38mm to 12mm. The measure would be more acceptable to fishermen, as it would allow the catch of anchovies and other small pelagics, while permitting the escape of juveniles and larvae of commercially valuable species. Through the local fisheries management committees, there will be a chance to enforce such measure.

The present Maritime Fisheries Regulation constitutes a constraint to the development of small-scale fisheries in areas were artisanal fisheries are in direct competition with industrial and semi-industrial shrimp trawlers. According to this regulation, trawlers are allowed to operate as close as one mile from the coast, so condemning the gill-net and longline fishermen to operate very close from the shore or take the risk of losing their gear. The destruction caused by trawlers on the substrata and the fish stocks close to the coast, is quite likely going to prejudice a sustainable use of the resource not only for the artisanal, but also for the industrial fishery.

The project is also seeking to modify current marine fisheries regulations so that industrial and semi-industrial shrimp trawlers should not be allowed to operate at less than 3 miles from the shore, to prevent conflicts between these fleets and artisanal fishermen, and to reserve sufficient space for artisanal fisheries development in the open sea, at least on an experimental basis, for the Angoche and Moma districts.

Although the establishment of co-management systems has been regarded as a priority and the way forward to address problems related to the use of fisheries resources in the Fisheries Master Plan, legal and institutional frameworks to encourage these types of developments are completely lacking in Mozambique.

The current maritime fisheries regulation that has been in force since January 1997, has established the Fisheries Management Committee, a consultative forum that advises the Ministry of Agriculture on fisheries management matters. This committee, composed of fishing industry representatives, fisheries research institutes and fisheries administrators, meet at least four times a year to jointly discuss and address fisheries management problems, and reach a consensus on the actions that need to be taken to solve them.

Artisanal fishermen's representatives have been invited to these meetings, but the experience so far shows that the main concerns have been usually biased towards problems that affect the shrimp fishing industry, since it involves bigger players and stronger interests for the country, since shrimp remains the most important export commodity. In addition to this, to date, no provisions are in place to integrate local fisheries management initiatives-for instance, the Moma and Angoche experiences-into this national framework.

Control of resources

Thus, the consultancy being prepared with the support of [he project will be a crucial development. It will help address issues related to the award of legal status to the local fisheries co-management committees. It will also contribute towards some devolution of power to fishing communities on the matter of exploitation and control of fisheries resources and for the establishment of more fisheries co-management systems in Mozambique.

This article has been written by Rui Falcao, Cassimo Marojo and Simeo Lopes of IDPPE, Mozambique

India

Community-based fishery management

Fishing by turns

The *paadu* system of fishery management used in certain fishing villages of Tamil Nadu, India is unique

The Pichavaram mangrove forest, located in the coastal districts of Codulore and Thanjore in Tamil Nadu, India is of the estuarine type. This forest is surrounded by four main fishing villages, namely, Killai, Thandavarayan Cholagan Pettai (T.S.Pettai), Kodiyampalayam and Palayaru. Nearly 60 per cent of the fishermen from these hamlets are completely dependent on the mangroves for their livelihood. The remaining 40 per cent utilize fishery resources of both the continental waters and the mangrove wetlands.

From time immemorial, the fishermen of Tamil Nadu have been following a traditional system of fishery management in the backwaters and estuaries. This system of management is locally called *paadu* or 'rotation' system. In the Pichavaram area, this traditional system is called *vunuvalai kattit (vunu* = stake; *valai* = net; *kattu* = regulation). This is mainly followed to manage fishery resources in the backwaters connected to the mangroves. In the Pichavaram mangrove waters, the intensity of fishing activities is mainly related to seasons.

Fishing during the summer season (mid-February to mid-October) is called *kodainaal* fishing *(kodai* = summer; *naul* = days) and fishing during the north-east monsoon season (mid-October to mid-February) is called *vaadainaal* fishing *(vaadai* = north; *naal* = days). The summer season is the lean season for fishing in the mangrove backwaters. During that time, the catch per unit effort is low, while the fishery abounds during the monsoon season.

In the traditional system of fishery management, fishing with any gear other than stake-net is restricted. To fish with *vunuvalai,* fishermen have to strictly follow the *paadu* system of management. One of the main aspects of this management system is related to the place and period of using stake-nets. The stake-net is normally used to catch prawns by putting it across the tidal creeks, channels and other large canals, particularly during the low tide when the prawns move towards the sea. In order to evenly share the resources, certain regulations are followed.

Villagers should engage in fishing only in areas of the backwater earmarked for them. Fishermen from other villages should not enter into areas earmarked for others, even if they catch less of prawn and fish in their allotted areas. The areas earmarked for a particular village are subdivided into smaller areas with different names and the village fishermen are divided into different groups. Each group should fish in all the selected areas on a rotation basis.

Each fishing village in the Pichavaram area has its own traditional system of fishery management. This can be illustrated by the following example. Killai village is one of the main villages that depends on the mangrove fisheries. The fishing population of this village is distributed in seven hamlets.

All the fishermen from these seven hamlets are grouped together and divided into six groups of approximately 60 to 80 fishermen. Each group is called a *kattu*. In the mangrove backwaters, five fishing areas have been earmarked for Killai fishing village.

Moving around

Of the six groups of fishermen, the first five will fish in five different places together as one group, moving from one place to another. The sixth group will not

go stake-net fishing on that day but go fishing individually instead.

Each group's members go out together with their nets and canoes to their respective grounds and place the stake-nets across the canal in single or double rows, depending upon the availability of the prawn catch. In the end, all the catches are put together and divided equally among all the members engaged in fishing on that day. On the next day, the sixth group can go fishing in the first ground, and the first group in the second ground, while the second group goes to third ground, and so on. The fifth group rests on that day and engages in other individual fishing activities.

Thus, every group covers all the five places in five days and rests on the sixth day, and the rotation starts again on the seventh day. Each group thus fishes in an allotted area once in seven days. This is mainly to avoid overcrowding of the area where fish and prawns are available in large quantities. This system of fishery management not only helps in avoiding overexploitation but also provides an opportunity for equal sharing of the fishery resources among the fishermen.

The other fishing villages also have their own *paadu* system and each village respects the *paadu* system of the other villages. Every year, the fishermen conduct meetings to admit new members to the groups or *kattus*, following requests and also to ensure that all the groups are balanced in number.

The *vunuvali kattu* system evolved thus: Earlier, when the population was small and the number of families few, there were more fishing areas. *Vunuvalai* requires more labour, nets and canoes. To ensure these inputs, family members who, earlier, went individually to some selected grounds for fishing, were grouped together.

In this method, those who reached the fishing ground first could occupy the entire ground and block access to all the fishes and prawns, while those who reached a little later would have lost their catch. Also, those families which were larger in size could dominate the village and effortlessly occupy the good fertile grounds, without permitting other weaker groups to come in.

The *paadu* system

To avoid these two problems, the villagers came to agree on a *paadu* system through which, on a particular day, one family goes to one place and another family goes to another place. On the next day, the first family goes to the second place with their family members. In the course of time, the original strength of each family increased through new linkages via marriage. The village population was grouped on the basis of *vagaiyaras* (families).

Due to declining fish resources as a result of siltation of many fertile grounds and the reduction in the flow of fresh and sea water, the Killai fishermen used to go to the Colerone river mouth, namely, Palayar, to fish during the summer (when the catch in the backwater is generally reduced) as well as in the backwaters, and return to their home village when the north-east monsoon started. In the course of time, some of the fisher families who had migrated did not want to return to Killai. But they found difficulties in taking part in the *paadu* system, since most of the demarcated areas were too far away. So they wanted separate areas for their stake-net operations. This matter was discussed in the Killai village panchayat (local council) and the claim of the Palayar fishermen was accepted.

Finally, Killai had to part with two *paadus*, with the condition that they must be used only by the Palayar fishermen who migrated from Killai and not by others who migrated from other fishing villages. Later, this condition was ignored and these places began to be used even by those who had migrated from other villages.

There are also other traditional methods of fishery management. Fishing for ray fish in the Coleron estuarine area using gill-nets has been banned by the local fishing community for the following reasons: Ray fish fishing needs vast areas to operate and thus hampers other fishermen from fishing. Ray fish fishing takes longer, around 12 hours-fishermen have to keep their nets in the water undisturbed throughout the night. This too prevents other fishermen free access to the area. It is to avoid this and also to give a chance to others that ray fish fishing was banned at the community level.

Another method of traditional fishery management is migration of fishermen to different places. During the summer, the fishery resources in the backwaters decline. The quantity of fish available then is normally not enough for all the fishermen living around the backwaters. So, many of the fishermen do not go to the backwaters to fish during that season but instead go to the sea. This reduces the population pressure on fishery resources in the backwaters. During the monsoon season, the fishery resource in the backwaters increases and so most of the' fishermen fish in the backwaters. This also prevents the overexploitation of the fishery resources of the mangrove backwaters.

Migratory fishermen

Interestingly, though the migration of the fishermen during different seasons reduces population pressure on fishery resources, it increases the dependency of the migratory fishermen on forest resources, particularly fuelwood. During

the summer, fishermen from Killai village migrate to the seashore and develop settlements, which, being on the seashore, have no suitable land for growing any tree species that can be utilized as fuelwood. They thus have to depend on the mangrove forest.

For a long time, the fishermen of Pichavaram mangrove backwaters enjoyed fishing in the backwaters without any external disturbance and, at the same time, they managed the fishery resources at the community level by self-regulation. In recent times, apart from the traditional fishermen, other communities, such as *Vedar, Vanniyars* and Scheduled Castes, have also started fishing in the mangrove backwaters. The fishing methods that these non-traditional fishermen follow are destructive to both fishery and forestry resources of the Pichavaram mangroves. The 'bunding' method of fishing followed by the *Vedars* prevents free flushing of the mangrove forest floor and even causes stagnation of tidal water and thus affects the biophysical conditions of the mangrove forest.

Due to the development of aquaculture farms in the region around mangroves, the demand for prawn seeds increased sharply over the last five years. The cost for each seed is between Rs O.50 and Rs l .00 and this attracts the non-traditional fishermen, particularly *Vanniyars,* to catch only prawn seeds in the backwaters. This goes against the wishes of the traditional fishermen who never exploit prawn seeds, since they know that this will affect future fishery resources. They asked the *Vanniyars* to desist from catching juveniles. But the *Vanniyars* refused to obey, emboldened by their majority status in the population. This led to communal clashes between the two groups and ultimately paved the way for the *Vanniyars* to stop fishing the juvenile prawns.

In recent times, according to the fishermen, fishery resources have slowly begun declining, due to siltation of the backwaters and creeks, and reduction in fresh water supply, and also due to the closing or silting of river mouths during the summer season. At the same time, the fishermen population has increased, while other communities have also entered the mangrove backwaters. As a result of declining fishery resources and the heterogeneous nature of the communities utilizing fishery resources, the management of the fishery has become complicated.

According to the elderly local fishermen, at one time, the Pichavaram mangrove forest was very thick and trees were very tall. Each trunk of the *Avitennia* tree, particularly of *Avicennia officinalis (karungkandal),* was so huge that a single person could not put his arms around a tree. Now, according to these elderly fishermen, [he forest cover has diminished to less than a quarter, and the tree density has been greatly reduced. They also say that now they see only shrubs, not big trees.

Several reasons are offered to explain the degradation of the Pichavaram mangrove forest. According to the local people, until 1972, the Department of Forest followed the coop system for tree-felling. They say that five coops were conducted between 1952 and 1972 in various areas of the Pichavaram mangrove forest. Only local people took the contract for felling the trees. In this system of tree-felling, the contractor should cut the matured and dead trees about 1.5 feet above the ground level within the area specified.

The area covered by one coop was about 30 acres and, altogether, seven coops were given for felling. Thus, the total area in which felling was permitted was about 210 acres. The labour charge for felling the trees was Rs 2 per tonne, while transportation by boat cost another Rs 2 per tonne. In all the coops, felling was carried out over the 20 years between 1952 and 1972. The coop system has since been abandoned.

Rampant felling

According to local people, the contractors used to remove all the trees, irrespective of age, ignoring norms and conditions. They also removed more than they were permitted. The villagers say that, after the felling, not a single tree has grown in these areas. The villagers also say that in certain areas, land has been converted into farming land and is now being used for the cultivation of groundnut.

Since 1972, the trees of the Pichavaram mangrove forest were felled on a large scale mainly for festivals, marriages and cremations. This mass felling of trees was carried out with the knowledge of the forest officials. During the festival season, the Forest Department used to publicly announce that villagers were allowed to fell trees for festive reasons. This resulted in unrestricted felling of trees during festivals. During weddings, invitations were given to the local forest officials by the head of the family, and consent for felling trees obtained. These practices, however, stopped about ten years ago.

The mangrove forests of the Pichavaram area have also been degraded by the collection of firewood for domestic purpose. But during the last five or seven years, local people say, collection of firewood has reduced, mainly due to strict enforcement of laws by the Forest Department. However, informal surveys reveal a continuous removal of large trees and twigs from the mangroves for domestic use.

All the local people believe that the mangroves are not degraded by grazing. In fact, some of them say that grazing actually helps the mangrove trees to grow since the cattle plough the ground with their hooves, apart from providing organic manure in the form of urine and dung.

The elderly fishermen of the area fully understand the importance of mangroves for fishery resources, protection against cyclones and soil erosion, etc., but do not have any idea on conservation. Most of the elderly fisherwomen were not aware of the importance of mangrove forests, but were willing to accept the truth. At the same time, they have the feeling that cutting wood for fuel is harmless to the forest. The youth among the fishers know the importance of the mangrove trees but also lack any idea on how to conserve them.

All of them, however, blamed the Forest Department officials for giving permission to cut the trees under the coop system, and for illegal felling in the past. But they also said that the forest officials are now strict in protecting the forest.

This article has been written by S. Subramanian of the Fisherfolk Organization for Advancement, Chennai, India

Needed: a jump-start

The Year of the Ocean in 1998 provides NGOs a good opportunity to make sure that the UN Agreement and the FAO Code actually take off

The UN Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks (UN Agreement) and the FAO's Code of Conduct for Responsible Fisheries (FAO Code), both adopted in 1995, have great potential to help reverse the world the world crisis in fisheries. The UN Agreement, a legally binding treaty, covers many commercially important fish populations. The FAO Code is voluntary, but covers a wide range of fisheries issues.

But will the UN Agreement and the FAO Code bring about real change? Or will they fulfil the predictions of those who argue that the environmental 'negotiation mania' of the early 1990s produced a large amount of UN documentation but few results? NGOs, which played an important part in negotiations of both the UN Agreement and the FAO Code, can help answer those questions.

The Year of the Ocean in 1998 provides a particularly good opportunity for NGO action on fisheries. At the international level, there will be many opportunities to highlight key issues-the commercial EXPO 98 in Portugal, for instance, and several FAO meetings, including a session of the subcommittee on fish trade of FAO's Committee on Fisheries (COFI), as well as consultations on issues such as the management of fisheries capacity and by-catch. However, the most important part will be to 'bring home' the UN Agreement and FAO Code at the regional and national levels, where an enormous amount of work remains to be done.

Many NGOs have begun to voice demands for change in the Year of the Ocean. Preparing in advance will help produce tangible results in 1998. An analysis of the problems that are blocking rapid and effective implementation of the UN Agreement and the FAO Code will help identify the points for intervention where NGO action is likely to have the greatest impact. With the large number of obstacles to implementation, it will be important to select a few key goals, whose achievement will reflect lasting changes.

Priorities will vary among NGOs, but there are likely to be many shared concerns, such as encouraging governments to ratify the UN Agreement and produce plans for implementing both the Agreement and the FAO Code, including goals against which progress can be measured. With clearly defined priorities and a focused approach, NGOs can achieve much, even with limited resources.

Thus far, 39 states have signed the UN Agreement, while only 16 have ratified or acceded to it. Only when 30 states ratify or accede to the UN Agreement will it enter into force. This has to be the priority, but another concern is ensuring that the states which have the greatest impact on fisheries abide by the UN Agreement. The state of fisheries will not be improved if only countries which represent a fraction of the overall tonnage, or which land a small percentage of the overall catch, become parties to the UN Agreement. It is worth noting that many of major-catch countries are developing countries, yet much of the catch is exported to developed countries.

Legally binding

The FAO Compliance Agreement designed to prevent vessel re-flagging as a means to avoid complying with rules on fisheries conservation and management, is a legally binding agreement which is complementary to the FAO Code. It has been accepted by only 10 states and entities (including the EU), yet requires that 25 states or entities accept it in order

to become legally operational. FAO has developed guidelines for implementation of the FAO Code, but there has been an unwillingness by member states to fully endorse and take action on them.

Until now, governments and industry have been able to get away with progressive sounding statements in international meetings and in the media, but the time for that should be past. It is through regional, national and local implementation that the UN Agreement and the FAO Code will be translated into practice, where their effectiveness wilt be measured and where provisions such as Art. 5 (g) of the UN Agreement, which requires states to protect biodiversity in the marine environment, can be given some substance.

We are at the beginning of a long process that will require much greater efforts than the negotiations of the two instruments, but time is short. The latest report from FAO on the state of world fisheries confirms that unless effective action is taken, overfishing will get worse. FAO's analysis of 200 top marine fisheries warns of a rapid increase in fishing pressure. In 1994, about 35 per cent of these fisheries were in a phase with declining landings, 25 per cent in a phase with a high level of exploitation, 40 per cent were still developing, and none of them were undeveloped. According to the FAO, even if effective management were introduced immediately for depleted fisheries, productions would only achieve gradual growth.

By-catch remains a major problem. FAO estimates that discarding could amount to around one-third of total reported annual production of marine capture fisheries, including a large proportion of juvenile fish. Coastal fish habitats are being degraded in many parts of the world. FAO notes that recovery times will be particularly long for stocks that require both a reduction in fishing effort and improved environmental conditions.

As the body that oversees matters pertaining to oceans and the law of the sea, the UN General Assembly is responsible for reviewing the UN Agreement. The first of such reviews was conducted at its 51st and 52nd Sessions in 1996 and 1997 via reports submitted by the Secretary-General to the General Assembly.

Perhaps because the UN Agreement has not yet entered into force, there has been very little progress to report, unlike 1995, when the UN Agreement was opened for signature. The lackluster debate may also signal a sentiment amongst governments that, for the moment, merely adopting the UN Agreement was a great enough achievement.

At the most recent UNGA oceans debate in November 1997; one of the two reports which was submitted by the Secretary-General was on developments relating to the conservation and management of straddling fish stocks and highly migratory fish stocks and the status and implementation of the UN Agreement. The other was a consolidated report on the issues of large-scale pelagic drift-net fishing; unauthorized fishing in zones of national jurisdiction; and fisheries by-catch and discards.

As called for under the UN Agreement, the report on the status of implementation of the UN Agreement will be submitted biennially hereafter (with the next report to be produced at the 54th Session in 1999), alternating with the consolidated report mentioned above (which will be submitted later this year at the 53rd Session).

NGOs accredited with the Economic and Social Council are invited to submit contributions for consideration in this year's report of the Secretary-General by the end of June. While it is unfortunate that both reports will not be issued annually, these reports provide a useful lobbying tool to spotlight successes and failures of governments on key oceans issues, as well as a means by which NGOs can effectively contribute to a process which is often seen as 'beyond the reach' of NGOs.

Wide-ranging reform

Regional fisheries organizations and arrangements, including those organized under the auspices of the FAO, will have to undertake a wide-ranging reform process

to change their rules and institutional structures to make it possible for them to implement the UN Agreement and the FAO Code. This will no doubt be a time-consuming process, which makes it extremely important that the regional bodies put themselves on track for reform as soon as possible.

It is now two years since the adoption of both the FAO Code and the UN Agreement and there is little practical evidence that regional organizations have recognized their role in the process of implementation of these instruments. The provisions of the UN Agreement are clearly applicable to all regional organizations. There is little hope if regional organizations continue with their business-as-usual approach of collecting, analyzing and exchanging information on stocks, and establishing management measures, while ignoring the need for better co-operation on fish stocks, assisting with monitoring and enforcement and public accountability.

Discussions in organizations, such as the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR) and the General Fisheries Council for the Mediterranean (GFCM), have been very discouraging. In 1995, FAO's Committee on Fisheries discussed the role of regional fisheries bodies, emphasizing the key role they have to play. The spotlight is now on these bodies.

One of the key provisions of the UN Agreement is Article 12, which requires regional fisheries organizations and arrangements to allow non-governmental organizations (which includes fishworkers' organizations) access to meetings, subject to certain conditions. The procedures for this shall not be unduly restrictive."

Current procedures vary, but most regional fisheries organizations and arrangements apply archaic rules, allowing only very limited participation by NGOs. Changing this would have an enormous impact-increasing public scrutiny through active NGO participation would probably revolutionize the way many of these bodies operate at the moment.

The most intractable problem around which most environmental negotiations revolve concerns financing, recently the subject of much discussion at the UN General Assembly. Special Session to evaluate implementation of Agenda 21.

Financial aid

Failure to resolve the financing issue should not be allowed to impede the entry into force of the UN Agreement, either by developed or developing countries. Realistically, the issue of financial assistance will not be resolved at one or two meeting sessions, but rather through a series of evolving measures adopted

over time. Some international institutions are already exploring ways of providing assistance for fisheries conservation and management, which is a positive step.

Very little work has been done on Part vii of the UN Agreement which deals with the requirements of developing countries, in particular, the least developed countries and small island developing states. This is an area where innovative thinking from NGOs could advance implementation of the UN Agreement. Interesting provisions include Art. 26.1, which requires states to co-operate to establish special funds to assist developing countries.

The UN Agreement requires the Secretary-General to convene a conference four years after the entry into force of the UN Agreement to assess its effectiveness, and propose measures to improve the conservation and management of highly migratory and straddling fish stocks that the Agreement deals with. This will provide an opportunity to address some outstanding issues. Reviews of the UN Agreement by UNGA should prepare for the Review Conference.

The UN Agreement and the FAO Code still leave many issues unresolved. For instance, only some parts of the UN Agreement apply in areas of national jurisdiction. Hot issues, such as excess fleet capacity, inappropriate subsidies and other trade-related issues, will require further international co-operation to be resolved.

What role do institutions such as the World Trade Organization (WTO) and the Organization for Economic Cooperation and Development (OECD) have to play? Other questions that have been raised include what role regional trade forums should have and how the Agreement on Subsidies and Countervailing Measures should be applied. Developing countries, concerned about deteriorating terms of trade, are following these discussions closely.

The roles of treaties and bodies such as the Convention on Biological Diversity (CBD) and the Commission on Sustainable Development (CSD) will need clarification. The CBD might have a contribution to make to improve fisheries conservation and management, but it is questionable whether the discussion of fisheries in the CSD adds any value, unless the CSD succeeds in defining a clear niche role.

It is not an option to allow the UN Agreement and the FAO Code to fail. Something must be done to 'jump-start' the two instruments. The Year of the Ocean in 1998 provides a great opportunity to change direction in fisheries. If the many highly effective and committed NGOs that work on fisheries take concerted action, focused on a few key priorities, they might well succeed in turning the current tide. Instead of remaining in limbo, the UN Agreement and FAO Code could become effective mechanisms for changing fisheries conservation and management globally.

This piece has been written by Joy Hyvarinen, Elizabeth Wall and Indrani Lutchman, who work on fisheries issues.

Book launch

What's the catch?

The launch of *A Livelihood from Fishing* at London's historic Billingsgate fish market was an occasion for same concerned reflection

Despite the early hour and morning chill, about 80 people turned up for the launch of Alain Le Sann's book, *A Livelihood from Fishing*, at London's Billingsgate Market on 29 January. Comprising a cross-section of the fishing community, participants included Members of Parliament, fish traders, fishermen, environmentalists, academics, NGO representatives and other interest groups.

Billingsgate Fish Market, and the early start, were chosen because Billingsgate is synonymous with the fishing industry in the UK: the name 'Billingsgate' has been associated with fish marketing over centuries. For almost as long as there has been human settlement in the London area, there has being a fish market there.

Today it is the UK's largest inland fish market, being served from almost every port in the UK. International trade is also increasingly important to Billingsgate: of its annual sales of 20,000-30,000 tonnes of fish and fish products, around 30 per cent is imported from more than 40 countries across five continents. Fish in fresh, frozen, salted, dried, smoked and a variety of processed forms are traded through the market.

However, the rise of the supermarkets and the vertical integration of the fishing industry have undermined the importance of Billingsgate. In the UK, between 60 and 80 per cent of the fresh and frozen fish consumed is retailed through the main supermarkets. Hundreds of small traders have been put out of business, and trading activities now bypass Billingsgate.

Billingsgate market was also chosen for the book launch as it provides an important link in the chain between fishers, fish traders, processors, retailers and consumers. Over the last few years, the public have been led to believe that the sole cause of diminishing fish stocks is "too many fishermen catching too few fish". The blame for overfishing has been laid unfairly on fishermen. Consumers, retailers and traders must also recognize their responsibilities.

The book launch was intended to highlight the interdependence amongst fish as food, as an important commodity for trade, and as a source of livelihood. Given that irresponsible and ill-informed consumption and inconsiderate and short-term marketing practices are driving fish stocks to extinction, the battle for sustainability is as likely to be won in the market as on the high seas. For the organizers of the book launch, a historical and interesting venue such as Billingsgate would attract the various actors and interest groups, and facilitate dialogue at a neutral and interesting venue

The beginning of 1998 also seemed to be a particularly appropriate time to be focusing on such issues: 1998 has been designated the International Year of the Oceans by the United Nations General Assembly. Moreover, during the first six months of 1998, the UK government has the Presidency of the European Union (EU) at a time when fisheries are very much on the national, regional and international agenda.

Limited access

The EU is undertaking a review of its Common Fisheries Policy (CFP), and 'up for grabs' are areas which, up to now, have been protected for inshore and local fisheries by limited access under the jurisdiction of the coastal state (mainly the 6- and 12-mile zones). These restrictions may be lifted in line with Articles 2 and 38

of the Treaty of Rome, which define fish stocks in EU waters as a common resource where vessels of all member states are entitled to freedom of access. The outputs of this review, therefore, have far-reaching implications for coastal state control and inshore fisheries (within the 6-and 12-mile zones).

The UK Presidency also falls at a time when the issue of coherence is receiving greater attention. Under the Maastricht Treaty, the EU has a legal obligation to ensure that its various policies (CAP, CFP, Trade, Development, Co-operation, etc.) are coherent with each other. Fisheries agreements have come in for much criticism because of the negative impact they are said to have on the sustainable development of local fisheries in the third countries concerned. The UK Government, as President of the Council of Development Ministers and Council of Fisheries Ministers, is responsible for initiating a review of the EU's fisheries agreements (to be carried out by June 1999), and for establishing a Fisheries and Development Co-operation working group to examine the coherence issues between fisheries agreements under negotiation and the policy objectives for Development Co-operation.

At the Billingsgate book launch, Chris Underhill welcomed the guests and made an introductory speech which drew on his personal experience of growing up in a small fishing community in Southern Spain. He noted, "Today, this community has become a tourist suburb. Completely deculturalized, it has lost its traditions and the original people have been driven out by the new owners of the villas. The loss of fishing traditions in many parts of the world is a very real threat to fishing people. Three-quarters of them come from the South, and it is they who produce 50 per cent of the fish that ends up on our plates. They also create a further 100 million or so shore-based jobs, so the loss of these fishing traditions will have a major impact."

To those of us who work in Intermediate Technology, the issue of sustainable livelihoods is of key importance. Creating a livelihood from fishing is as much about making ends meet, as it is about turning an honest penny. As this book emphasizes, earning a living or creating livelihoods from fishing is far more than a commercial activity. It is a way of life with cultural traditions, involving traditional knowledge and expertise, and requiring an understanding of the environment and the need to maintain an ecological balance.

Fundamental concept

This, concept of livelihoods, combining traditional ways of life with modem economic activities, is fundamental to Intermediate Technology's work and beliefs. It is a central pillar of the

organization and one which was established by our founder Fritz Schumacher. His 'Small is Beautiful' philosophy is very much alive today, despite those who like to contradict us by saying 'Big is Better'! Our answer to them is that powerful factory ships owned by a few large companies and employing only a few fishermen is not the answer.

If we are going to sustain our fish stocks in ways which ensure the continued supply of fish to provide livelihoods and to feed future generations, then fisheries must maintain their close links with the people of the sea. Sustainable fishing must, apart from conserving fish stocks, involve viable fishing communities and the sustaining of livelihoods in those communities. This is a central theme of this important book, and central to our work at Intermediate Technology.

Both Chris Underhill and Brian O'Riordan (IT's Fisheries Specialist) emphasized that conserving fish stocks and sustaining fisheries for future generations is as much about sustaining livelihoods and economic activities in coastal communities with access to few other resources, as it is about protecting the environment and preserving fish stocks. Biological sustainability is of little value to human society if it is isolated from social and economic sustainability. Economic development, when divorced from human development and ecological sustainability, invariably leads to greater inequality and poverty.

Disappointingly, the issues of fish marketing were only briefly touched on, despite many of the participants representing the wholesale and retail fish trade. Thoby Young, Director of the Fresh Food Company, commented that consumers all over the UK would like to know where the fish they are buying-in the supermarkets or on the slab-comes from, and how they can tell that it is from a sustainable source: "No such system, as far as I am aware, exists. Indeed, the only fish mark that is widely recognised in the UK would be the Scottish Salmon mark, and, as far as I understand, farmed salmon is itself a very damaging product environmentally, as a result of hi-tech methods. So, what can the fishing industry, and possibly legislation as well, do to support consumers who would wish to contribute to the position outlined in the book?"

On the issue of the review and possible reform of the CFP, Austin Mitchell, MP for Great Grimsby and a great supporter and advocate of fishworkers' rights in the UK, highlighted the importance of coastal state management and giving fishermen greater responsibility as key stakeholders in fisheries: "We need a policy of coastal state management, a greater role for the nation state-the only guarantor of its own fish stocks, and their guardian for the next generation. We also need community control of fisheries, so that those people who are fishing locally can protect the stocks and can play a part in management. We need some system of management which makes the fisherman a stakeholder in the industry, instead of a predator and a looter. We need to make the fishermen stakeholders in the stocks, so that they become responsible for the management and understand the need for conservation."

"What we need to do," he continued, "is work towards greater coastal state control and local control by the local producer organizations. We need coastal state control because only the nation state has any interest in conserving the fish stocks and making laws. What the Common Fisheries Policy produces by making fish a common resource to which all members have equal access, is a competitive situation of 'open slather' and that can't go on.

Co-fishing

Andrew George, MP for St. Ives in Cornwall (a community with old fishing traditions and a high degree of dependency on fishing), supported this view, but took it a step further by advocating co-fishing and co-management and calling for the protection of coastal waters within the 6-and 12-mile limits: "Community fishing does exist in this country, and I think that it is something that we need to protect-We need to protect the work of the Sea Fisheries Committees, and we need to protect the (6-12 mile) fishing limits and the fish stocks which occur within those limits. Sustainable fisheries is certainly an

expression which has got very common currency today, and needs to, as it is the only basis for the future: we need to establish a policy which gives fishermen themselves a sense of stake, a responsibility, if you like, in the future management of the industry.

Certainly, we need to protect this where it does still exist in Britain, and it certainly exists in my area as 'co-fishing'. Fishermen go out as 'co-fleets' in the way that you (Chris Underhill) were describing in the Mediterranean, working together and recognizing the need to give the stock a rest in that area, arid to take responsibility for the management of it."

Charles Secrett of Friends of the Earth also supported this view of co-management, but pointed out that, in the case of Europe, "there is an impossible match between a political arrangement that can not deliver the social and environmental objectives that everyone sees as essential to resolving the crises. Two solutions that have been proffered are, on the one hand, local control over fish resources, and, on the other, measures to use appropriate technology to harvest those resources. But how can these objectives be realized under the Common Fisheries Policy, where there is a mismatch between a political arrangement and its inability to deliver what everyone accepts is needed?

If you can't change it, the consequence is that you either carry on with it or you somehow find a way of escaping it. There is a political dimension to this that is so fundamental, and because it is so fundamental, it makes it so difficult to deal with. It seems to. us that it's only by making a common alliance between environmental organizations, fishing industries and the communities in which they live and work, and politicians who are prepared to ban this other agenda, that we have the only chance of reforming the policy."

Commander Rankin of the Parliamentary Maritime Group agreed that the CFP needs reforming, but "it is not realistic to talk about getting out of the EU-it might be possible but it isn't going to happen. What is important is that we really work from now until 2002 in getting the CFP right. However, the most important word that I haven't heard today is the whole question of subsidiarity. Getting down to the local fishermen, getting those people out of Brussels down at that level... I am very concerned that we get the scientists and the fishermen, the inspectors, the enforcers and the rest of them together, actually in the individual fisheries. Taking up the point of technology, there is no way we can stop the fishermen from using modern technology. What we have got to do is stop it wiping out the stocks."

On the international dimensions of the CFP, Roger Barton, a Billingsgate trader, noted that "charity begins at home", and that we should protect our (UK) waters from foreign interests. David Godbold, a Thames fisherman, further noted that "exclusive rights of the users" was an important issue and that small-scale fisheries, such as the one he operates in, is being overwhelmed by 'nomadic fishing'. According to him, "This is undertaken by large scale fishing vessels which circumnavigate the British Isles under all types of flags taking the communities' livelihoods away. I have been fishing for 35 years and nomadic fishing is a huge problem."

The EU's fisheries agreements also came in for some criticism. According to Austin Mitchell, developing country fisheries are now "threatened by the industrialized world's obsession with commercial fisheries. In Europe, we are actually making that situation worse. The fishing agreements signed by the EEC with several developing countries, particularly in Africa, are used to subsidize the European fishing industry, and do not aid

A Livelihood from Fishing

A report from the Billingsgate Book launch is available from Brian O'Riordan, Intermediate Technology, Schumacher Centre for Technology and Development, Bourton Hall, Bourton on Dunsmore, Warks CV23 9QZ., UK Copies of Alain le Sann's book. A Livelihood from Fishing, are available from IT Publications at a cost of £10.29. Contact Guy Bentham by email: orders@itpubs.org.uk, fax: ++44 171 436 2013, or by writing to IT Publications, 103-105 Southampton Row, London WC1B4HH.

development in those countries concerned. Big vessels, particularly Spanish vessels, are going in and decimating their stocks under these agreements."

Euan Dunn of RSPB (Bird Life International) was impressed by the huge amount of fish on the market from overseas fisheries: "In fact, about 50 per cent of the fish that we eat in the UK now comes from abroad. A very high proportion of this is brought in by the bilateral fishing agreements mentioned, which represent, in a sense, quota hopping on an international scale. They are also causing a huge amount of environmental damage to the coastal environment. Could I ask Brian O'Riordan what progress is being made towards a Code of Conduct for Responsible Fisheries?"

Brian O'Riordan replied that he felt that the proposed FAO Code of Conduct seemed like "a voice crying in the wilderness! When it comes to fishing agreements, for some reason, these are viewed as commercial arrangements between governments (and not subject to any code). What I don't understand is how governments can get away with entering into so-called commercial arrangements, which effectively subsidize their own fishing fleets to fish in other people's waters, and which, as you say, are a kind of quota hopping."

Andrew George noted, "Under the EU, we still do have an opportunity to influence and try to improve opportunities for people in other parts of the world. Particularly for the Senegalese, for example, through the EU, we actually have the opportunity to re-define the expression 'charity begins at home.' Charity begins at home, but it doesn't end there, and we need to be working both within Britain and internationally to ensure that we promote the message that Intermediate Technology has very aptly presented to us today."

Rene-Pierre Chever, representing Alain Le Sann and the NGO *Peche et Developpement*, took this issue a step further. Quoting from Alain Le Sann, he said, "What is needed today is a more global approach to fisheries, an approach which addresses quality of life and working conditions, as well as the protection of the marine environment and coastal areas. A purely economic approach will not safeguard our fisheries, when the environment is being destroyed and young people are leaving the sector.

Increasing support

Rather than increasing support to the sector, we need to find ways of reallocating it to encourage more responsible fisheries which employ more fishermen. It is totally wrong for European tax payers to be financing such plundering operations, as the Senegalese

are having to put up with in their pelagic fisheries, or that the Argentineans are having to put up with in their hake fishery."

Translation power

He further noted that "the considerable work we put into writing this book could never have the impact it may yield, had it not been translated into English. We would like to thank Intermediate Technology very much for this. The essence of the book is that there is an essential humanism embodied in the culture and way of life of people who live from fishing. This is something that has got to be asserted in such a book which can be read widely."

This report has been filed by Brian Q'Riordan of intermediate Technology, UK and a member of ICSF.

Aquaculture

Engineering the Blue Revolution

It is doubtful whether intensive aquaculture or genetic engineering is the answer to the crisis in the world's fisheries

The 1990s may well be remembered as the decade when crisis first hit global fisheries. For the 200 million people, mainly from developing countries, who depend on diverse thriving aquatic ecosystems for their livelihoods, the consequences have been most severe. Since the 1950s, the world's fishing fleet has been growing, reaching a peak between 1970 and 1989, when fleets grew at twice the rate of fish landings.

Corporate-ridden and stimulated by international development agencies and banks, the industrialization of fisheries and the race for the last fish, have led to global problems of overcapacity and over investment. Each year, the governments of the world subsidize the global fleet by US$ 54 billion to obtain catches to the value of US$ 79 billion. Ever more sophisticated technology is carried by larger vessels and bigger fleets producing more waste. The Food and Agriculture Organization (FAO) of the United Nations has calculated that close to one-fifth of the world's marine fish catches are discarded back into the sea.

As fish become scarcer, prices increase and the international fish market expands to new grounds. Fish production in the Southern countries has skyrocketed with foreign exchange earnings from their fish increasing from US$ 9 billion in 1983 to US$ 17 billion in 1993. While both states and small-scale fishermen in the South may temporarily benefit from higher prices, the poor and the not-so-poor consumers in the South gradually lose their access to a traditionally cheap protein, as fish literally travels North, either by boat or plane. Exports increase more than production and internal fish consumption decreases. In the period 1978-1988, African per capita supply decreased by 2.9 per cent and, in South America, by 7.9 per cent, while fish has become expensive even for the middle classes in India.

The average fish consumption in the North is triple that of the South, even though fish constitutes a more important part of the diet in many areas in the South, particularly Asia. For example, in Bangladesh, where fish accounts for more than half of the animal protein intake, the average annual per capita intake is 7.2 kg, in contrast to the United Kingdom and United States, where fish accounts, respectively, for around 10 per cent and six per cent of the animal protein intake, annual per capita consumption is close to 20 kg. In the long term, both in the North and South, the intensification of fishing activities results in small-scale, inshore fishermen being pushed aside.

Although global fish catches have steadily increased since the 1950s, to 116 million tonnes in 1996, there are numerous signs that this trend is unsustainable. According to the FAO, in 1994, 35 per cent of fishing grounds were overexploited or depleted, while 25 per cent were fully exploited and only 40 per cent allowed for an increase in capture under current exploitation patterns. As the FAO itself puts it, "The ever-growing total tonnage of world fishery production gives a misleading vision of the state of world fishery resources and a false sense of security."

Something fishy

There is no shortage of indications that something fishy is indeed happening to our oceans. Just a couple of examples may help to give an idea of the depth of the problem. Worldwide, only the Western Pacific still keeps healthy tuna resources, while Greenpeace reports that "scientists estimate that overfishing has reduced Southern bluefin to only 2-5 per cent of its original population levels." Almost all

groundfish stocks seem to be heavily fished or overfished-in just 10 years, the world catch of groundfish species has been halved.

It had traditionally been considered that the likelihood of fishing any species to extinction was remote. Nevertheless, in 1996, the IUCN included about 100 species of marine fish in its Red List of endangered species. Besides several species of tuna, this includes sharks and more than 30 species of sea horse.

The evidence is so large, and the implications so deep (not only for the world's peoples, but also for the fish processing industry) that the problem has now been widely acknowledged. However, more than stressing the need to change fishing strategy, those who created the problem in the first place, such as the World Bank, the FAO and the agri-food industry, are keen to promote aquaculture as a new industrial sector. In the words of Ismael Serageldin, Chair of the Consultative Group on International Agricultural Research (CGIAR), "On land, we have learned to produce food by cultivation. But in the sea, we still act as hunters and gatherers."

To raise the sense of urgency, we are again reminded about the need to feed a growing world population. The FAO projects that, by 2010, there will be a shortfall of 16 million tonnes in the supply of fish and fishery products to meet demand. As the North Atlantic Salmon Conservation Organization (NASCO) says, "By the year 2025, the demand will have increased from 100 million to 165 million tonnes."

The crisis is also recognized by industry, as mentioned by Aquaculture Production Technology, a specialized Israeli company: "The only way to bridge the gap between reduced capture fisheries output and increased world demand is through aquaculture." A closer look at the proposed solution of aquaculture raises doubts as to its long-term viability. It is noticeable that to convince society of the importance of learning to cultivate fish, the promoters of aquaculture have their best arguments in the experience of farming communities worldwide, who have been doing it for millennia. The harvest of wild fish and other aquatic produce such as crabs and frogs, collected from rice paddies after the first heavy rains, continues to be key for food security and animal protein intake for many farming communities in lowland areas of Asia. Aquaculture, however, starts when human action controls or enhances the rearing of fish, crustaceans or mollusc. The raising of carp within complex agricultural rice systems in China is perhaps as old as rice culture itself. Rice farmers in Kerala, India, have for centuries managed a polyculture system based on rotational cultivation of rice and shrimp called *chemmeen kettu*. Equally, 300 years ago, the Japanese learnt to favour the growing of seaweed for their diet.

These low-external input aquaculture systems, which are often referred to as 'extensive aquaculture' by the formal sector, do not compete with other uses of the aquatic environment, but rather complement them by helping to close nutrient cycles. For example, in many countries, particularly in Asia, farmers have developed systems in which wastes-poultry, animal and plant wastes-are thrown into fish ponds to encourage the growth of organisms which fish feed upon. Wastes are then returned to the field as fertilizer. The main fish species in these systems are carp and, more recently, tilapia. These systems still thrive today through local initiative and NGO rural development programmes. Rice farmers are continuously adapting fish culture to their needs, such as pest and weed control.

Farmers' innovations have helped enhance nutrition and increased income. In Indonesia, fish can help raise incomes from paddies, because fish income does not have to be shared with the landlord. The results of the introduction of fish in complex agricultural systems may be spectacular even from a purely economic point of view.

Malawian experience

Malawian farmers have been able to totally transform their farm management through aquaculture in the marginal wetlands, associated with vegetable cropping. After seven years, these farmers came to earn more from the gardens and

ponds than from their croplands and homestead, and it has been calculated that, for every dollar invested in the wetlands, seven were generated. The importance of such aquaculture for food security is reflected in the fact that 85 per cent of aquacultural production in the South is consumed locally.

The new prophets of aquaculture intend to reproduce the Green Revolution production model in aquaculture. Industry, multilateral development banks and UN agencies proclaim it as the 'Blue Revolution.' Although occasionally referring to the benefits of traditional aquacultural practices, what they propose is entirely different: the monocropping of high-value species to supply international markets. Will a model based on the Green Revolution that failed to meet the needs of the resource-poor and increased genetic erosion in agriculture, do any better underwater?

Though half of marine aquacultural production is actually made up of marine algae and seaweed, mainly kelp, this article focuses exclusively on fin fish. In the last 10 years, aquaculture production has more than doubled, to one-fifth of total world fish production. Given that one-third of all fish catches are turned into fish oil and fishmeal, aquaculture provides a quarter of the fish used for direct human consumption. Impressive as this growth may look, it reflects mostly the activity of a single country, China.

Asian developing countries are the centres of production and, in 1995, China alone accounted for 63 per cent of total world aquaculture. The other main producers are India, the Philippines, Indonesia, Thailand, Bangladesh and Taiwan. Among developed countries, Japan and the US are the main producers, followed by France, Italy and Norway.

The species produced vary according to the kind of water and the regions. Worldwide, the bulk of the production is still from low-value freshwater species that are raised in integrated agricultural systems: carp and, to a lesser extent, tilapia. The farming of this latter species has recently expanded very quickly in Asia and Africa.

Aquaculture species

In 1992, worldwide production of tilapia reached 473,000 tonnes, mainly from China, Indonesia, the Philippines and Egypt. The production of various carp species is higher still. In 1995, worldwide production of the silver grass and common carp was 6.7 million tonnes. Although carp are also important in some European countries, particularly Hungary, developed countries tend to cultivate more value-added fish species in their freshwaters. In the US, the main species is catfish, while trout is

appreciated in the us, Europe and Japan. Brackish waters, a mixture of sweet and marine water with intermediate salinity, are found in such places as mangroves, estuaries, lagoons and swamps.

They account for 7.1 per cent of fish aquacultural output, centred on high-value species. In developing countries, there has been a wide expansion of export-oriented shrimp aquaculture, while in European-Mediterranean countries, these areas hold the production of oyster and high-valued carnivorous marine fin fish species, such as striped sea bream and sea bass. If traditional integrated aquaculture activities in Asia are left aside, in the North and South, aquaculture is focused on high-value species (molluscs, crustaceans, marine fish and salmon) that together account for 31.5 per cent of world production, equal to 61 per cent of the total market value. It is these areas where the promoters of the Blue Revolution have invested their resources.

The most serious impact of the Blue Revolution aquaculture is that, rather than increasing global catches, it may very well lead to lower total productivity of our seas. Most intensive aquaculture operations take place in shallow waters, which compete with other possible uses. Plentiful sunlight and nutrients in these zones contribute to the position of shallows as the world's most diverse and productive types of marine ecosystems, including sea grasses in temperate zones, and mangroves and coral reefs in tropical areas. Such systems harbour the juvenile stages of most fish species, including oceanic fish, which sustain both traditional and industrialized fishing activities.

The intensive, high-density cultivation of fish and shellfish has environmental effects similar to those of intensive breeding of livestock or poultry. First and most evident is the accumulation of organic matter, both in the form of unconsumed feed and faeces. When aquaculture activities are conducted directly in the marine or brackish environment, this accumulation may well lead to a process of eutrophication, with associated depletion of oxygen near the sea bottom or throughout the water column, and a proliferation of unicellular algae, some of which may be toxic. Compounding these problems is pollution by pesticides and antibiotics, used intensively when animals are raised in such high densities. The result is a serious loss of local biodiversity. This has particularly occurred in sheltered waters, such as with salmon in Norwegian and Chilean fjords, with the raising of oysters and mussels in lagoons and estuaries, and with the raising of shrimp in ponds.

When aquaculture employs the construction of special installations, such as ponds, the impacts are even more pervasive. The most extended example of intensive aquaculture, and that which has been promoted most aggressively by international development banks and institutions is shrimp aquaculture. Farming shrimp and prawn, or 'pink gold', for the lucrative markets in the North, is the most prominent example of the social and environmental consequences of intensive aquaculture practised on a big scale. It has grown quickly in Southeast Asia, Ecuador and Central America. In 1990, Asia alone accounted for 80 per cent of the world total, covering 820,000 hectares, which produced 556,000 tonnes. Principal markets remain Japan, the US and Europe, with a total market value of nearly US$ 7 billion.

Shrimp culture is one of the main causes of the destruction of mangroves. In Thailand, 40 per cent have been destroyed and the clearing for pond construction is only one part of the story. Although there are hatcheries for shrimp larvae, when this supply is not sufficient, larvae are fished from wild mangrove systems using fine-mesh nets that also sieve out big quantities of other marine organisms.

Problems with aquaculture

Shrimp aquaculture is not only conducted in mangroves, but also on agriculture lands close to water bodies. Besides the displacement of farmers and rice culture, the high needs of fresh and salt water lead to a drying of underground water sources, with a subsequent penetration of saline water. Such deterioration means that the average life of aquaculture farms is only three to five years before being

abandoned, leaving behind salted, polluted land of no further agricultural use.

Behind these environmental costs, there is the social price that local communities pay by losing access to both aquatic and mangrove resources. In Bangladesh, for example, shrimp farmers have priority in leasing land, which has deprived local people of their rights to common land and public water bodies. Government regulations to encourage export often worsen the problem. In the Philippines, fishers' unions have protested that bays where they fish have been obstructed by fish pens. Despite this, it is still local fishers who provide most of the fish that is locally consumed.

The instability inherent in such intensive farming systems results in local communities being unable to participate. In the words of Roger S.V. Pullin, the Director of the Inland Aquatic Resource Systems Program of ICLARM, "For stand-alone fish farms, a farmer might expect a total loss or at least serious loss of profits at least once in 10 years and perhaps, on average, twice in 10 years. This would mean bankruptcy for some commercial operators, and life-threatening situations for some resource-poor farmers in developing regions." Later, the inevitable environmental degradation resulting from intensive aquaculture forces operators to change their locations. Both factors have made the sector the domain of capital-intensive operators who do not need to bear the costs of environmental degradation, that is, investors who are able to put their returns into other sectors, or companies able to find new sites for their operations.

Dazzling export figures hide enormous costs for the countries that export shrimp. The annual profits from these operations in the State of Andhra Pradesh, India, are believed to cross millions of rupees. However, according to the Third World Network, the negative impacts on local communities and the environment far outweigh any production gains, when viewed in a wider perspective. Indeed, a coalition of Indian NGOs has challenged the right of the shrimp industry to destroy the rights to livelihood of millions of coastal people. Their actions led the Supreme Court of India to dismantle existing installations and to ban new operations.

Inbreeding

Aquaculture has relied on fish stocks from a narrow centre of origin, with subsequent inbreeding causing impaired genetic performance. A classic example is that of the cultivation of tilapia in Southeast Asia. As Pullin explains, "Some fish were collected from open waters in Egypt in 1962 and shipped to Japan. Some of their

descendants were shipped to Thailand in 1965 and they produced a strain that has been widely fanned since then. A few fish of this strain were shipped to the Philippines in 1972 and their descendants have since been farmed there."

In spite of the selection efforts by Filipino farmers, in 1989, their tilapia A turned out to be less efficient than new founder stocks collected from the wild in Egypt. As a solution to this problem, ICLARM launched a programme in the mid-1980s to develop genetic resources for tilapia that has led to the creation of the 'super-tilapia', using Egypt's wild populations.

Genetically impoverished stocks would only be a problem for aquaculturists if it were not that there is no way to avoid the escape of cultured fish into the surrounding environment. This may come as a consequence of bad weather, floods, broken equipment, etc. In fact, fish of cultured origin are sometimes even purposely used to re-stock native populations.

To understand the impact of such escapes and releases, it is necessary to take into account the fact that, particularly in freshwater hydrological systems, populations have adapted to their environment through particular genetic combinations. If large enough numbers of introduced fish inter-breed with wild populations of the same or related species, these particular combinations of environmental adaptation are lost. Small, wild populations are particularly susceptible to this kind of genetic contamination.

A good illustration of the scale of escape in aquaculture systems is salmon. Adult salmon are raised in giant cages floating in the sea, close to the coast. In 1995, the number of salmon known to have escaped from Norwegian salmon farms increased to almost 650,000, from 570,000 in 1994, and, the same year, the proportion of fish of farmed origin in samples from the coastal fisheries was 42 per cent. In the Magagudavic River, Canada, 1995 estimates of salmon caught being of farmed origin were as high as 90 percent. Even if there is no inter-breeding or released fish are sterile, there are other potential effects on wild populations which are often impossible to predict. It is well known that many native populations of Atlantic salmon in Norway are threatened with extinction, from a parasite introduced through genetically resistant salmon populations from the Baltic Sea. The most severe case of extinction caused by an introduced species may be the case of the Nile perch, which led to the loss of nearly 200 unique species of cichilds in Lake Victoria.

Perhaps the most pervasive effect of the Blue Revolution is that the rise in production of carnivorous fish (accounting for all the luxury fish raised) and shrimp has translated into a large demand for fishmeal, which has to be obtained from wild fisheries. Worldwide a third of fish catches are devoted to fishmeal.

The rise of, particularly, shrimp production, has introduced new fisheries to tropical countries where they were virtually unknown previously. In Thailand, this has already been translated into 'biomass fishing'. Whereas earlier, the sea bottom was trawled for shrimp, with the rest of the species discarded or sold in local markets, now it is done to extract anything that can be turned into fishmeal.

However, many of these species have been part of the traditional food of coastal communities. As a result of these destructive practices, people are deprived of cheap protein. In Indonesia, demand for prawn feed is making unaffordable previously inexpensive and locally available products such as sardines. In Malaysia, the same phenomenon has resulted in a shortage of fish for the salted fish industry.

No trickle-down benefits

With local communities marginalized, unable to participate in the system, and weighed down by environmental consequences, intensive aquaculture is of no benefit. There is little evidence either to suggest trickle-down benefits from export earnings. From a national perspective, the Blue Revolution results in a transfer of cheap protein from the South into less abundant, more expensive protein to be exported to the North. The economic and monetary crisis in Southeast Asia shows

that relying on currency and external markets, rather than ensuring internal production for food security, may be a dangerous gamble.

In January 1996, for the first time in history, genetically engineered salmon was grown in a commercial hatchery in Loach Fyne, Scotland.

The 'AquAvantage Bred Salmon' were genetically engineered for accelerated growth rate with a technology developed by a research team from Memorial University, Newfoundland, Canada. The technology transfer was mediated by the Boston-based firm, A / F Protein.

The application of genetic engineering to fish started in 1982, with the familiar moral justification of the need to feed a future world population. As NASCO puts it, "The predicted demand for aquatic organisms from a rapidly increasing world population will require increasing use of biotechnology in aquaculture."

Developing countries are encouraged to get on the bandwagon as soon as possible. "The ability to produce transgenic fish and shellfish in culture, which grow faster and to a larger size with more efficient utilization of nutrients, is of particular value to developing countries, not only as a source of food, but also as export products," states a World Bank Discussion Paper on Marine Biotechnology and Developing Countries. It comes down to a question of faith in technology, but before engaging in it, countries should ask themselves whether genetic engineering in aquaculture provides a solution to the real problems.

Failure to address key questions such as the environmental stress on marine ecosystems with their resulting impoverishment, and the progressive marginalization of coastal communities from economic and nutritional livelihood, may result in gene technology compounding the existing crisis.

Behind the promises of the technology, fish genetic engineering is so far very inefficient and random. The most frequently used methodology consists of inoculating the desired genes egg by egg, or embryo by embryo. The idea is that the gene will be incorporated into the egg's genome and then expressed in the transgenic adult.

Tedious work

Injecting fish eggs one by one is tedious and requires skilled operators. The efficiency is low, with the average number of transgenic fish obtained from inoculated eggs usually ranging between 0-13 per cent of those that survive. Much of current research effort is devoted to developing techniques that allow large-scale transfer of genes into fish. Teams around the world are busy trying to develop more efficient mass transformation' methods, such as

electroporation, particle bombardment, the use of liposomes and sperm cell vectors, so far with little success.

The reality of fish genetic engineering today is more a question of luck and tricks than a comprehensive understanding of the processes involved. Added to this, even NASCO acknowledges that many genetically modified fish are highly inbred.

Although there is much basic research to be resolved, scientific teams have embraced applied research, and have not disregarded patents in the process. Increasing the economic appeal of aquaculture has provided the motivation to focus on three lines of research into faster-growing, freeze-resistant and disease-resistant fish.

Feed accounts for roughly half the operating costs in fish farming: Growth rates, and food conversion efficiency of cultured fish species, are of utmost interest to aquaculturists. The first fast-growing transgenic fish, a common carp incorporating a mouse promoter gene linked to a human growth hormone gene, was developed in China in 1986.

Scientific teams from the US have since genetically engineered carp and catfish, while British and Cuban groups have centred their efforts on tilapia and Canadian scientists have focused on salmon and trout. Overtime, and in order to avoid the sensitivities of consumers scientists have increasingly used gene constructs containing only fish genes.

It is Canadian scientists who have achieved the most dramatic results with transgenic salmon growing up to 10 times faster than control groups. This was done by adding the growth hormone gene of a chinook salmon, controlled by an ocean flounder antifreeze gene promoter. It is these fish that have been exported to Scotland.

Transgenic salmon

A further gene construct, based on the Pacific sockeye salmon, created transgenic salmon that were, on average, more than 11 times heavier than non-transgenic controls, with one individual an extraordinary 37 times larger.

However such top growers paid their price by showing cranial deformities an opercular overgrowth. At the age of one year, the deformities became more severe and were followed by death.

The Canadian team is also researching the production of freeze-tolerant fish. The cultivation of salmon, for example, is limited to certain latitudes, because if water drops below zero degrees Celsius, the salmon's cells freeze and the fish dies.

However, some demersal fish species thrive in waters under ice, such as the

ocean pout, thanks to a protein that prevents their blood freezing. Canadian scientists had the idea to isolate the antifreeze protein gene from a winter flounder and insert it into the salmon's genome.

Results proved disappointing, with the salmon producing only one per cent of the protein level naturally found in the flounder. It was while doing this experimentation that, by chance, scientists discovered that the antifreeze protein gene promoter activated growth hormone expression.

With fish under high-density cultivation being particularly prone to sickness, the interest in disease resistance is understandable.

For viral infections, there have been several approaches to disease resistance. One of them has been the use of antisense technology, which a Japanese team has used to genetically engineer trout resistance to the necrosis blood virus.

Several approaches have also been undertaken to fight other infections. Canadian teams working on salmon are targeting a trout gene as a bacterial inhibitor. Another approach, undertaken by a team working in New Zealand, is to insert the genes, encoding for biologically active peptides from frog skin.

Although these represent the main areas of research, other points have caught the scientists' attention. A Japanese team is attempting to develop a gene to make freshwater fish tolerant to salt and vice versa.

Another line of research relates to genes involved with skin pigmentation, with the economic motivation for tailoring fish colour to culinary and ornamental tastes.

Compared with plant research, transgenic fish research is still in its infancy and, to a large extent, carried out by public research centres or institutes that have established large teams which cross national borders and have close working relationships with their counterparts. It is yet to be seen whether these relations will survive if technologies are introduced on a commercial scale.

Financing the Blue Revolution

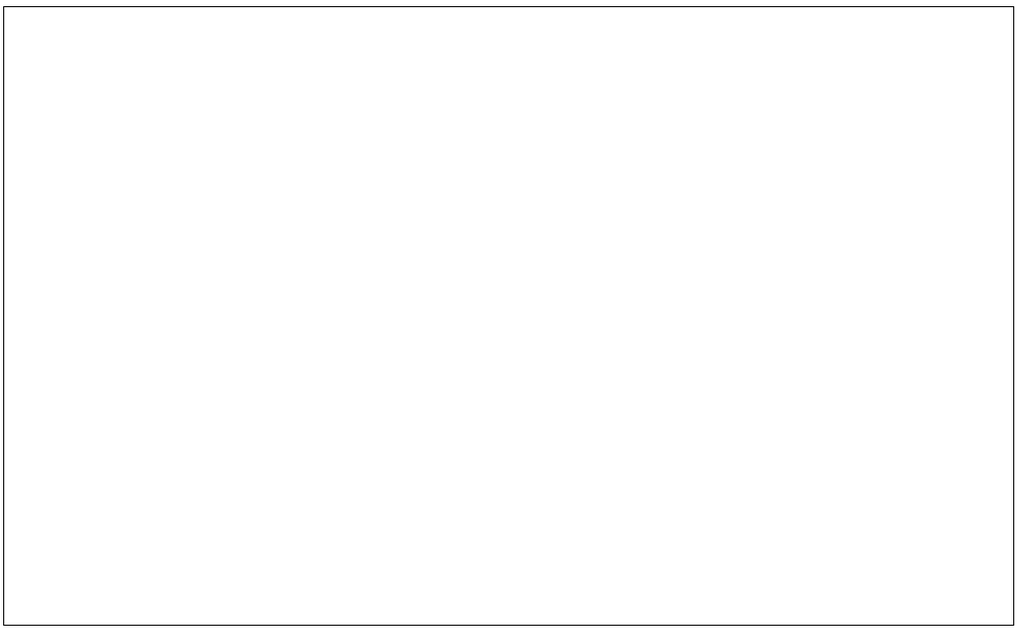
The growth of intensive aquaculture in developing countries, including shrimp aquaculture, has been stimulated by an intensification of loans from multilateral aid agencies. From 1988 to 1993, a third of the money committed to fisheries consisted of aid to aquaculture.

The Ecologist reports that, in 1991, World Bank (WB) loans for aquaculture included US$ 420 million to India, US$ 386 million to China, and US$ 267 million to Argentina. Though the negative effects of intensive aquaculture have become increasingly evident, there has been little change in Word Bank policy. In May 1997, the WB approved a US$ 40 million loan to the Government of Mexico to help finance an aquaculture development project to intensively grow shrimp, tilapia, scallop and abalone. The objective is to increase Mexico's 15 per cent aquaculture contribution to total fisheries production. The Bank has drawn criticism for only consulting local people, after the plans were already drawn up, when little could be changed.

In 1997, the bank also approved a US$ 120 million loan for livestock and aquaculture development in the Heilongjiang Province of China, the aim being to expand fish production by constructing 584 hectares of new ponds, rehabilitating 237 hectares of existing ponds and restocking a 12,000-hectare natural lake.

Superficial knowledge

Our knowledge of marine ecosystems remains superficial and knowledge of both short- and long-term effects of .transgenic fish is necessarily poor and schematic. One certainty we have is that transgenic fish will escape into the rivers and oceans in the same way that their non-transgenic relatives do. In the case of fast-growing fish, their effects on wild populations and ecosystems would depend on whether these fish grow faster because they eat more or because they are more efficient. In the first case, they would present more competition to wild stock. The increased size at a given stage in its life cycle could result in transgenic fish competing with other species of the ecosystem or in its predators not being able to feed from it.



The case of the freeze-resistant salmon would allow this species to colonize entirely new ecosystems, where they could compete with the existing carnivorous species. Such a scenario leaves open the possibility for thriving and invading large areas, a situation that would be compounded if the genetic character was transmitted to wild salmon populations. A similar story of species advantage disrupting the natural balance would be the danger with disease resistance.

Although, in the long term, the aquaculture industry would be affected by such interactions, the fishing sector would be the first one to note the impact of the release of transgenic fish into the environment. To prevent these problems, scientists argue that it is possible to design transgenic fish which are unable to reproduce, a claim that is far from proven. Even if such modifications were achieved, they could alter the behaviour of the transgenic fish, with a resulting impact on wild populations or ecosystems. The point is not whether such risks are acceptable, but if they are needed at all. Proponents of the Blue Revolution technology, who continuously remind us of the need to feed the world, will affirm that we need to bear the risk. But where is all this leading to?

If the trends of overfishing, intensive aquaculture and genetic engineering are taken to their extreme, the image that comes to mind is that of impoverished marine ecosystems producing large amounts of 'designer' fish, under the control of corporations able to invest in and maintain, such systems. In this brave new world, cultivating the aquatic environment would be a task of industry, and the role of people would be reduced to workers and quiet consumers of more or less sophisticated fish protein. This industrialization of the aquatic environment is, in fact, the very core of The Blue Revolution.

Growing population

It is certainly true that the world will have to feed a growing population, but it is even more urgent that it starts feeding its current population and does it in a way that does not pre-empt capacity to continue in future. Instead of trying to resolve existing problems by developing new answers that will invariably lead more problems, a better solution would be to solve existing problems and look into the available alternative that can nurture the base of life: diversity.

The initial step towards this objective is to review fisheries management. After taking into account both the degree of exploitation of our seas and oceans and its direct and indirect impacts, it seems clear that, under current fisheries practices, the present total catch is unsustainable. Two questions then come to mind. Would it be possible to maintain current harvest levels in a sustainable way? And would it be possible then to even increase it?

The answers to these questions depend on who you ask. The FAO maintains that marine captures may be sustainably increased by 20 million tonnes, if a number of conditions are met, namely, that degraded resources are rehabilitated, underdeveloped resources are exploited avoiding overfishing, and discards are reduced. Other voices propose a radical change in the very heart of fisheries management, including its underlying assumptions.

According to this approach, the main objective of fisheries management should be the protection of marine resources against the causes that lead to their overexploitation. In the long term, such a change would not necessarily mean a decrease of the harvest. In the waters of the EU, it would be possible to obtain a level of catch similar or even larger than the ever-dwindling amounts that the EU member states overfish year after year, if proposed management practices were adopted.

An approach that is concerned with maintenance, over mere conservation, could be defined as a harnessing approach, such as has been the root of the way many coastal communities have managed their fishing grounds for millennia.

Having been plundered for all they are worth, the world's oceans have become impoverished, drained of the rich biodiversity that once fed so many. For an industry desperately seeking to secure supply for continuing demand, the short-term fix of the Blue Revolution is an attractive one, if not the only solution to industry's own survival. Supplying prawns to restaurant tables in Rome, Washington or Tokyo may bring in ready cash, but it is devastating for aquatic ecosystems and the millions of people who depend on them for their livelihood.

Both intensive aquaculture and genetically engineered fish are the last-gasp efforts of a dying industry trying to sustain itself, and should be clearly seen as short-sighted in approach. The sorriest players in all this are the international banks and institutions, who, instead of supporting the sustainable fishing practices of the South, are, instead, lending millions to industry to keep the North supplied with luxury fish. Existing integrated aquaculture systems provide a prosperous alternative to the Blue Revolution, which could be successfully enhanced in the future.

This article, part of ongoing work by Anna-Rosa Martinez, first appeared in Seedling, the quarterly newsletter of the Genetic Resources Action International (GRAIN)

Does trade always make the grade?

Given the variety and complexity of fish resources and markets worldwide, it is not possible to generalize about the virtues of global trade

About a third of the global fish production is believed to enter international trade and, in value terms, it amounts to US$ 52 billion. According to the FAO Yearbook of Fishery Statistics, the developing countries increased their share of international trade in fish and fish products from 44 per cent in 1985 to 46 per cent in 1995 (declining from 51 per cent in 1994). In the same period, the share of tow-income food-deficit countries (LIFDCs) increased from 14 per cent to 19 per cent.

Trade in fish and fish products is a significant activity for employment, income and foreign exchange for LIFDCs, which account for over 90 per cent of the global population of fishworkers. Most of these fishworkers are in the artisanal sector and are dependent on fisheries for their life and livelihood. The significance of international trade in fish and fish products is further enhanced by the fact that the net foreign exchange earning from seafood exports is one of the highest for these countries.

Although the fish caught by artisanal fishers is primarily for the domestic market, the income earned from exports is significant for their livelihood. The access to international market for fishworkers from the artisanal sector is, however, hampered by tariff and non-tariff barriers.

They also have to compete with the operations of large-scale and distant water fleets which have an unfair advantage over the artisanal sector because of several subsidies that are both hidden and open.

The pressures on the marine resources of one country in a particular region could be relieved if resources could move into the processing and retailing sectors of that country from another in the same region. This is assuming that the latter has healthy fish stocks that are acceptable to the former. In several African countries, for example, fish can not move from one country to another due to high tariff barriers. If such barriers could be reduced, there could be greater intra-regional trade which, in addition to reducing pressures on national waters, will also generate new employment opportunities and benefit fish consumers.

Similarly, it is important to reduce import tariffs on processed fish especially from developing countries, so as to promote export of processed fish that could provide employment and income opportunities in many developing countries. Right now, the tariffs prevailing on processed fish in the European Union (EU) and the United States are very much on the higher side and act as a barrier to trade for several developing countries.

There are several instances of sanitary and phytosanitary measures and technical barriers to trade being used in a discriminatory manner against fish exports originating especially from developing countries. Certification programmes now contemplated by non-state parties, to unilaterally define and apply criteria for sustainable fishing practices from a Northern perspective, could further act as non-tariff barriers for exports from the developing countries.

Private initiatives

The private eco-labelling initiatives intended to circumvent state machineries and now being developed under the auspices of the UK-based Marine Stewardship Council, could be to the disadvantage of fisheries in developing countries, including artisanal fisheries that produce fish for export to developed countries. Such initiatives can neither

prevent overfishing nor contribute to effective management of fisheries, especially the highly diverse artisanal fisheries in the developing countries.

These initiatives could also result in fishers in developing countries losing their autonomy with respect to the patterns of harvesting and disposal of their catch in the export market. Moreover, such attempts to have an elegant and universal definition of sustainability is next to impossible, given the diversity of fisheries and the state of poor knowledge in many parts of the world about the impact of fisheries on various stocks.

It is generally argued that subsidies given to the fisheries sector encourage movement of capital into a sector that is already overcapitalized; that they promote overfishing and that they represent misallocation of government financial resources. While this argument applies significantly to the fisheries of developed countries, especially to the distant-water fleet of EU, it has the following shortcomings in the context of developing countries:

First, it is based on the assumption that subsidies in fisheries sector are going primarily to harvesting and not to the processing or marketing sectors. While this may be the case in many developed countries, the situation that prevails in many developing countries may be different. The actual situation, however, is not clearly known and needs to be studied.

Second, it is based on the assumption that fish stocks are generally depleted. While this may globally be true, the situation could be different in several countries, especially in the Indian Ocean region were resources may not be overfished.

Although the quantum of subsidies given to the harvesting sector is not really known in the case of developing countries, it could be safely assumed that most of the subsidies given to the harvesting sector goes to large-scale fleets that may not be economically viable without the aid of these subsidies.

The extent of subsidies to these fleets, mainly in the form of concessional credit for construction of fishing vessels and fuel subsidies, poses an unfair threat, in the form of competition for space and for resources, to the artisanal sector.

Several examples

There are several examples of such subsidized fleets overfishing especially ground stocks in different parts of the world (e.g. Thailand, Senegal, Ghana, and South Africa). The subsidies to the large-scale fleets distort trade. The products from the artisanal fisheries sector would have to compete with the products from the large-scale sector in the international export market.

The artisanal sector is often at a disadvantage because of its inability to compete with the subsidized fleets of large-scale fisheries which, because of these subsidies, are in a better position to sell at a cheaper price in the international market.

Moreover, the externalities of indiscriminate large-scale fishing operations are borne by the society at large, and this also acts as a hidden subsidy to the large-scale sector, thus further distorting trade.

The operation of distant-water fleets in third countries under fisheries agreements-which essentially is export of subsidized fishing capacity-often clashes with the export potential of fish and fish products of developing countries. This is because of the impact of distant-water fleet on the fisheries of third countries, in terms of competition for space arid for resources, structurally similar to the impact of large-scale fisheries on artisanal fisheries. This, in turn, negatively affects the livelihood interests of coastal fishing communities.

The subsidized distant water fleet in the waters of third countries have been criticized for causing negative impacts on the resources of the developing countries and for distorting trade. In Mauritania, for example, it has been pointed out that the operations of foreign fishing vessels under fisheries agreements, including those with the EU and the Peoples Republic of China, have overfished the local cephalopod stocks. Further, the highly efficient and locally beneficial domestic cephalopod fleet, using primarily artisanal technologies, is put at a disadvantaged position.

Moreover, the tariffs imposed on the export of processed fish and shellfish to discourage landing, processing and exporting from developing countries where the fish is actually harvested, deprives developing countries of enhancing employment opportunities in the labour-intensive fish processing industry. This deprives especially LIFDCs from crucial employment and income opportunities in the coastal areas. Many artisanal fisheries in the tropical belt are dependent on high-priced shrimp production, and face competition not only from destructive trawling operations but also from brackish water aquaculture operations. Many of the environmental and natural resources costs of shrimp aquaculture operations are borne by society, and amount to hidden subsidies to the aquaculture industry.

As a result of these hidden subsidies including, for example, unpriced use of land, water and ecologically sensitive ecosystems (mangroves and wetlands), the aquaculture industry can sell shrimp at a cheaper price in the international market and discriminate against those artisanal fishers, who use passive and environment-friendly fishing techniques.

In capture fisheries, however, subsidies may be required to create an incentive for fishers to shift to more resource-friendly fish harvesting methods. Subsidies may also be required to develop fisheries for certain underexploited stocks, so that pressure on certain overexploited stocks could be removed. There are also certain social situations where subsidies are warranted in fisheries, as, for instance, to help the coastal population to overcome the vagaries of a civil war (for example, in Mozambique) or famine (for example, in Senegal).

Considering the poor opportunity cost of labour in fisheries in many developing countries, fishery resources play an important role in alleviating rural poverty. Fish is not only a source of food, but also an important source of livelihood. Therefore, the sustainable utilization of fishery resources should be in the best interests of governments and fishing communities, who are primarily dependent on fisheries for their life and livelihood. This, however, is not the case in most LIFDCs.

Enormous pressure

Trade in fish and fish products seems to put an enormous pressure on fisheries resources and their utilization in a sustainable manner. This is particularly so in the case of international trade in sedentary and demersal stocks (for example, *beche de mer*, trochus, giant clams, lobster and shrimp). in several countries, for example, resources that have little or no domestic market but with

good international demand have been overfished.

Liberal trade regimes do seem to play a role in exacerbating overfishing of some of the most vulnerable and valuable stocks. In the absence of effective and enforced fisheries management systems, the market signals, especially those emitting from the export market, seem to have an overriding influence on resource exploitation.

State policy, while efficient at the level of promoting revenue-earning activities like production for the export market, is woefully inadequate when it comes to revenue-expending activities, like fisheries management. This asymmetry needs to be addressed. There is surely a need to redirect present subsidy policies towards facilitating improved fisheries management and monitoring, control and surveillance systems.

Even if price distorting subsidies are removed in pursuit of liberalized trade regimes, it would still be difficult to say that this would automatically lead to less capital moving into the fisheries sector, less fish being caught, and greater adoption of sustainable fisheries management systems. It can not be generalized that trade in itself is good, as long as regulatory frameworks are absent or deficient. Studies need to be done to show the impact of trade on renewable resources like fish stocks, before arriving at any conclusion.

Unless efficient and purposive fisheries management programmes are put in place, it would be quite meaningless to leave fish mainly to the dynamics of trade. In countries with poor fisheries management policies and programmes, perhaps the only way to protect the right to life and livelihood of economically disadvantaged coastal communities, is to have some restrictions on trade until a proper management system is put in place. This would certainly help reap the benefit of a renewable resource to its optimal best.

This paper was submitted by ICSF to the WTO Symposium of Non-Governmental Organizations on Trade, Environment and Sustainable Development Geneva, Switzerland, 17-18 March 1998

Tread cautiously

At the FAO Technical Consultation on Policies for Sustainable Shrimp Culture, ICSF suggested 10 principles for sustainable shrimp aquaculture

It is now two years since the Code of Conduct for Responsible Fisheries was unanimously adopted by the FAO Conference and we would like to thank FAO Fisheries Department for organizing this highly relevant Technical Consultation on Policies for Sustainable Shrimp Culture. We are happy to be here at this Consultation. The co-operation established with NGOs during the Code process thus continues into more specific areas now.

The International Collective in Support of Fishworkers (ICSF) works to defend the right to life and livelihood of artisanal and small-scale fishworkers, especially in the South. Although ICSF's main area of work is related to marine fisheries, it is concerned about coastal aquaculture because of the implications of such developments for fishworkers and their communities.

The implications of shrimp aquaculture for, and its impact on, artisanal fishworkers were a major cause of concern at the South Asian Workshop and Symposium on Fisheries and Coastal Area Management organized by ICSF in Madras from 26 September to 1 October 1996. Participants from Bangladesh, India and Sri Lanka were serious in emphasizing the environmental, social and economic impacts of shrimp aquaculture on rural communities in their countries.

The main reason for the boom in shrimp aquaculture is a growing market for shrimp in the North, in conjunction with stagnant or reduced supplies from capture fisheries in the South. The wild stocks are already heavily overfished, as a result of unselective bottom-trawling in the coastal waters and destructive fishing of shrimp juveniles in lagoons and backwaters. The negative ecological and social impact of bottom-trawling has been a matter of tremendous tension in the Asian region for at least 20 years, prompting several countries to create an exclusive zone in the coastal waters for artisanal fishers. Indonesia even banned trawling in the 1980s. The plight of fishers is now complemented by the indiscriminate development of shrimp aquaculture.

Almost the entire production of shrimp from aquaculture is in developing countries and, therefore, the negative impacts of shrimp aquaculture are of particular concern to fishworker organizations in several Asian and Latin American countries.

Fishworkers in countries like Bangladesh, India, the Philippines, Sri Lanka, Thailand, Ecuador, Peru, Mexico and Chile have expressed strong concern about the unregulated development and mushrooming of shrimp farms in the coastal areas for at least five reasons.

First, they fear that habitats and food chain linkages, essential for healthy fish stocks, are being destroyed as a result of mangrove clearance and the gleaning of gravid females and post-larvae from coastal waters-They protest the associated destruction of fish larvae, the loss of their nursery grounds, and declines in the diversity of coastal species.

Passive fishing disrupted

Second, they are incensed about interference in their fishing activities by shrimp aquaculture operations. Passive fishing operations are often disrupted by onshore installations to pump sea water. Turbidity resulting from shrimp farm effluents, and noise pollution from sea water pumps affect fishing grounds and disrupt fishing.

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Third, they resent the loss of traditional access rights to the coastal commons. Access, both to the shore and to the fishing grounds, is increasingly obstructed by shrimp ponds, forcing fishworkers to take different, and often much longer, routes to the fishing ground from their settlements. Further, fishworkers are also deprived of space to dry fishing nets and to process their fish.

Fourth, they protest the disruptions to their community life and to their non-fishing activities. There are instances where drinking water sources have been contaminated. Salination of the soil has impacted negatively on subsistence farming, while common lands, used for grazing cattle, collecting firewood and for fulfilling other primary needs, have suddenly become inaccessible or degraded. These, in particular, have increased the workload of women in the fishing communities. Off-season employment opportunities for fishworkers in farming operations have also declined.

Fifth, they apprehend the development of the fishmeal industry, since the demand for fishmeal and fish oil may lead to fishing down the food chain, with adverse consequences for fisheries, especially in Asia. Fishmeal and fish oil are two of the principal components of shrimp feed. Thailand, for example, reduces about 60 per cent of its total marine fish production into fishmeal, which has serious implications for the capture fisheries of the artisanal sector. Moreover, the water discharged from fishmeal plants has polluted the shellfish grounds of artisanal fishers in many places in Peru and Chile.

While the disruptions to coastal fishing activities and the inconveniences to fishing communities are well known, no serious attempts have been made to systematically document the negative impacts and to establish viable policies to remove such impacts in the long run. There are no effective regulations to manage shrimp aquaculture in a socially and ecologically responsible manner.

The apparent potential for huge economic returns, in the short-run, including foreign exchange earnings, has led governments and business interests to ride roughshod over the long-term interests of fishing and other coastal communities. The expected rate of return on investment in shrimp aquaculture does not take into consideration the true social, economic and ecological costs.

Internalized costs

Once such costs are internalized, the economic rationale to pursue resource-intensive shrimp aquaculture development may cease to exist. Unless there is an effective regulatory regime based on sound principles, shrimp aquaculture will continue to cause problems.

Any definition of sustainable shrimp aquaculture has to take into serious consideration ecological, economic and social aspects. The following ten points should be urgently taken up while developing an effective monitoring and control system for shrimp aquaculture.

1.Recognize the right to life and livelihood of fishworkers.

States should make every effort to ensure that fishworkers are not adversely affected by the development of shrimp aquaculture industries. Their right to a secure and just livelihood and their access to fishing grounds should be protected. In this context, states should uphold Article 6.18 of the Code of Conduct for Responsible Fisheries:

> 6.18. Recognizing the important contributions of artisanal and small-scale fisheries to employment, income and *food* security, states should appropriately protect the rights of fishers and fishworkers, particularly those engaged in subsistence, small-scale and artisanal fisheries, to a secure and just livelihood, as well as preferential access, where appropriate, to traditional fishing grounds and resources in the waters tinder their national jurisdiction.

2.Implement Article 9 of the Code of Conduct for Responsible Fisheries.

We are happy to notice the importance this consultation attaches to Article 9 of the Code of Conduct for Responsible

Fisheries. We would specifically urge this consultation to attach special significance to the following paragraphs and to incorporate them into regulatory mechanisms:

9.1.1 States should establish, maintain and develop an appropriate legal and administrative framework which facilitates the development of responsible aquaculture.

9.1.2 States should promote responsible development and management of aquaculture, including an advance evaluation of the effects of aquaculture development on genetic diversity and ecosystem integrity, based on the best available scientific information.

9.1.3 States should produce and regularly update aquaculture development strategies and plans, as required, to ensure that aquaculture development is ecologically sustainable and to allow the rational use of resources shared by aquaculture and other activities.

9.1.4 States should ensure that the livelihood of local communities and their access to fishing grounds are not negatively affected by aquaculture developments.

9.1.5 States should establish effective procedures specific to aquaculture to undertake appropriate environmental assessments and monitoring with the aim of minimizing adverse ecological changes and related economic and social consequences resulting from water extraction, land use, discharge of effluents, use of drugs and chemicals, and other aquaculture activities

3.Set up participatory regimes for aquaculture regulation

States should set up regulatory regimes for shrimp aquaculture with the participation of all stakeholders, including fishworkers. Additionally, the practice in some countries, in relation to salmon aquaculture, of prior notification of areas that could be brought under aquaculture operations subject to no objection from the communities living in the vicinity of those areas, should be adopted in shrimp aquaculture.

4.Ensure legislative coherence and greater co-ordination among agencies

States should provide a cohesive set of legislation for the management of shrimp aquaculture and should ensure greater co-ordination among the departments of industry, finance, trade, agriculture, forestry, fisheries and other relevant departments at the national and local levels in planning, implementing and

monitoring of shrimp aquaculture activities.

5.EstablishEnvironmental Assessment (EIA) procedures

Before granting approval to shrimp aquaculture operations, States should make mandatory environmental and social impact assessment procedures. EIAs must be prepared in the context of existing activities in the area and their likely burden on the ecosystem. All EIAs should account for the social, economic and ecological costs due to shrimp aquaculture. Further, there should be provisions for a public review process.

6.Adopt a precautionary approach

Given the extent of negative externalities from shrimp aquaculture and the poor state of knowledge about the impacts of shrimp farming, it is important to apply a precautionary approach to shrimp aquaculture development. This should be done not only from an ecological point of view, but also from an economic and social point. Any attempt at promoting aquaculture should be made only after looking at its likely consequences for other sectors, especially marine capture fisheries.

7.Introduce ecolabels in shrimp aquaculture

It may also be worthwhile to develop ecolabels to certify that a particular kind of shrimp aquaculture operation has been carried out in a responsible manner. This could be possible after developing a set of criteria for sustainable aquaculture in consultation with all significant stakeholders, including fishworkers, under the aegis of the state and/or non-state agencies.

8.Withdraw financial support to irresponsible aquaculture practices

Governments, multilateral and bilateral agencies should withdraw credit support to all forms of shrimp aquaculture that are socially irresponsible and ecologically destructive.

9.Implement compensation mechanisms

Penal clauses should be introduced in national legislation to ensure that the aquaculture industry pays for the damages it causes to the environment and to the life and livelihood of fishworkers and other coastal communities.

10.Minimize dependence on fishmeal and fish oil as a source of feed

It may further be worthwhile to discourage aquaculture practices dependent on fishmeal and fish oil that are manufactured from fish caught by destructive fishing practices. Preference should be given to shrimp aquaculture practices that depend on locally produced feed and which can be integrated into fishing and farming operations.

Any form of aquaculture activity that leads to the destruction of mangroves and the associated destruction of fish larvae and their nursery grounds should be prohibited. Interference by aquaculture activities in fishing operations and in accessing fishing grounds and coastal commons should be completely stopped. All disruptions to community life in coastal areas should be prevented. A precautionary approach should be adopted for shrimp aquaculture development. Viable aquaculture regulatory bodies should be set up with the participation of all stakeholders, including fishworkers. Coastal states should uphold the interests, as well as the right to life and livelihood, of fishing communities. We hope this Consultation can contribute substantively to developing a purposive policy framework to address the negative impacts of shrimp aquaculture, especially on Southern artisanal and small-scale fishworkers.

This Submission of ICSF was mode to The FAO Technical Consultation on Policies for Sustainable Shrimp Culture, held at Bangkok, Thailand, from 8-12 December 1997

Multilateral Agreement on Investment

No safe passage

The OECD's proposals for a Multilateral Agreement on Investment spells danger for fisheries

In 1995, negotiations were concluded in New York on the UN Agreement on the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks. Representatives of 139 states had been involved in the process, which resulted from the increasingly crisis-ridden state of many of the world's fisheries. The Agreement was an attempt to develop a management regime which would halt and, it was hoped (somewhat optimistically); reverse the dual trends of increasing fishing capacity and effort, on the one hand, and decreasing resources, on the other.

Articles in the Agreement dealt with:

- the precautionary approach to fisheries management;
- the duties of flag states and port states in ensuring compliance with management measures;
- the need for states to co-operate in matters of compliance; and
- the special requirements of developing states and the need for co-operation with them.

A particularly important aspect of the last point was the acceptance of the need to "avoid adverse impacts on, and ensure access to, fisheries by subsistence, small-scale and artisanal fishworkers" (Article 24.2(b)), as well as an agreement to "assist developing states to enable them to participate in high-seas fisheries for [straddling and highly migratory] stocks, including facilitating access to such fisheries" (Article 25.1(b)).

At about the same time as dignitaries from so many countries were solemnly putting their signatures to the UN Agreement in December 1995, other representatives of many of these same states were meeting for another series of negotiations. These, however, were being held in secret and by an 'invitation only' group, namely the members of the Organization for Economic Co-operation and Development (OECD) and a few hangers-on.

This select group began to hammer out a new international economic pact, known as the Multilateral Agreement on Investment (MAI), intended to promote greater legal security and protection for investment as well as to ease the movement of capital (both money and production facilities) across borders by limiting the power of governments to restrict and regulate foreign investment. In the words of the Preamble of the current draft text of the MAI, "agreement on the treatment to be accorded to investors and their investments will contribute to the efficient utilization of economic resources, the creation of employment opportunities and the improvement of living standards."

These noble words belie the true intention of the MAI, though, which is to force countries to grant extraordinary rights to multinational corporations, enabling them to move money and property freely across borders, virtually without let or hindrance. The effect would be to completely undermine the beneficial results of the UN Agreement mentioned above, as well as many other recent international agreements which concern the environment, labour standards and social policy.

International investment

By all accounts, the MAI, as it stands, would fundamentally alter the climate for international investment by preventing

governments from providing more favourable conditions for their citizens and domestic companies than for other investors.

Among the major provisions are the following:

- Countries would be required to treat foreign investors no less favourably than domestic ones. For instance, they could not maintain economic assistance programmes that benefit only domestic companies or place restrictions on what foreign companies own.

- Limits would be placed upon performance requirements, which are laws that require investors to meet certain conditions (minimum levels of domestic employment, requirements to purchase goods in that country or to hire a given level of local personnel, restrictions on exports, etc.).

While countries would be allowed to lodge reservations, specifying that particular articles of the MAI would not apply to certain industries, such as fishing, it is not clear whether they would eventually have to be phased out, whether they could be modified to reflect evolving situations or whether new reservations could be added later, as new industries or technologies develop. New reservations, however, could not be lodged by existing signatories once the Agreement enters into force.

Perhaps the most audacious aspect of the MAI is that private investors and corporations would be allowed to sue national governments in an international tribunal, rather than in that country's domestic courts, though governments would not be able to sue the investors before the same international tribunal. Multinational corporations would essentially be given rights denied to national governments.

Initially limited to the OECD countries, others would be invited to sign the MAI but only after the negotiations had been concluded. If the programme envisaged in the MAI is carried through to its conclusion, the implications for fisheries are profound. Yet, there has been no broad public debate on the matter, as there was for the FAO Code of Conduct for Responsible Fisheries or the UN Agreement, or even the GATT negotiations. The fishing industry in the OECD countries has not been consulted.

No public participation

This lack of public participation is made more serious by the unusually long time frame of the Agreement. If a country wishes to withdraw from the MAI once it has entered into force, it must wait five years before giving notice to that effect. The provisions of the Agreement will, nonetheless, continue to apply for a period of 15 more years-Much can happen

in 20 years-recall how the fishing industry has changed since EEZs came into widespread existence in 1977.

A few examples of the possible implications of the MAI for fisheries should show the dangers. One of the most contentious aspects of fisheries management is the allocation of the total allowable catch (TAC). Most countries give preferential access to their domestic fishermen, only allowing others in for those species which are not fully utilized. Would the MAI allow such favouritism? If all foreign investors are to be treated at least as favourably as domestic companies, would it be possible for, say, a Canadian company to establish a subsidiary in a small island state in the Pacific and thus gain access to the rich tuna stocks there?

Governments and regional management organizations usually set the TAC based upon some variant of Maximum Sustainable Yield as a target. There are many other possible targets, though, based upon other biological or even economic criteria. If, as a conservation measure, a country wishes to maintain fish stocks at somewhat greater abundance, would it be at liberty to do so? If quotas must be reduced to allow stocks to grow, would a country be obliged to reduce access for all sectors of the fleets to the same extent?

Many countries have developed extensive programmes of subsidies to support certain parts of the fisheries sector, including unemployment and reconversion schemes, shipbuilding and modernization support, fuel subsidies and others. Could some of these programmes be deemed to be preferential treatment under the MAT and thus banned? Could multinational corporations, such as Pescanova, establish a subsidiary in another country and demand equal access to these programmes?

The lodging by the European Union (EU) and several of its member states, of reservations to the MAI with respect to access to fish stocks, is eloquent testimony that these concerns are not mere conjecture.

International agreements

Curiously, nowhere does the MAI make any mention of any other international agreement, treaty or convention relating to fisheries, such as the UN Convention on the Law of the Sea, the UN Agreement on the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks or any of the regional management bodies. In fact, among all the international bodies, only the International Monetary Fund (IMF) is mentioned as providing "obligations", which can not be altered by the MAI. A Preambular paragraph mentions Agenda 21 and the Rio Declaration on Environment and Development, but some delegations object to making any reference of this nature.

Once the MAI has been finalized by the 29 OECD member states and a few others, it would be open for accession by other states. It is not clear under what conditions the acceding states could join and to what extent they could lodge their own reservations. Accession would have to be approved by those countries which already belong, so they would have an opportunity to put pressure on new members to keep their reservations to a minimum.

The negotiations for the MAI have not concluded, but in March, the European Parliament became the first democratic institution in the world to comment on the draft text. By an overwhelming majority, the Members rejected the philosophy of the MAI as it currently exists: they called upon the member states of the EU' to "not accept the MAI as it stands".

It now appears certain that the MAI will not be finalized and ready for signature before 1999: the United States and the EU have some significant disagreements to work out. It is even possible that the MAI will be stillborn, at least as a creation of the OECD.

However, it is clear that the ideas which it contains shall, indeed, see the light of day in one form or another, as they form a pervasive trend throughout major international financial instruments. For example, there are reports that the IMF may require similar types of concessions from countries which wish to receive financial aid.

This article has been written by CFFA Adviser, Helene Bours, in her personal capacity, and Michael Earle, Fisheries Adviser to the Green Group in the European Parliament.

News Round-up

Caviar, anyone?

In late January 1998, Russian Fisheries officials announced that **Russia** would issue export certificates for black caviar produced in Azerbaijan, Kazakhstan, and Turkmenistan. Under the Convention on International Trade in Endangered Species of

Wild Fauna and Flora (CITES), export certificates on sturgeon products (e.g. caviar) will be required after 1 April 1998. While Russia is a member of CITES, Azerbaijan, Kazakhstan and Turkmenistan are not. However, Russia asserts that it can issue export certificates for CIS countries that are not CITES members.

Good riddance!

Early this year officials in **Japan** announced their unilateral decision to terminate a 1965 fishery agreement with **South Korea** in a year's time. Negotiations on a new agreement to accommodate intersecting exclusive economic zones have become stymied by conflicting territorial claims, with 10 rounds of bilateral talks held since May 1996. Negotiations are likely to resume.

In response to the Japanese decision, South Korean officials stated that their fishermen would no longer be required to observe voluntary restricted areas agreed to outside Japan's 12-nautical-mile exclusive fishing zone.

In late January 1998, eight South Korean fish trawlers protested the Japanese decision by entering and fishing in a restricted area off the Japanese island of Hokkaido.

At least five Japanese Fisheries Agency patrol boats have been sent to monitor the South Korean trawlers. Japanese fishermen reported damage to gill-nets in restricted waters off Hokkaido and suggested that South Korean vessels could be at fault.

Food alert

Close on the heels of similar action by the European Union, the Food Inspection Agency of **Canada** placed **Bangladesh** seafood on an 'import alert list'. Concerns had been raised after June 1997 EU inspections of Bangladeshi plants found that proper sanitation was questionable for some Bangladeshi products. The Canadian alert requires that all shipments be subject to evaluation to detect any improper condition.

Boo to taxes

Fishermen in **Greece** blockaded island fishing ports in the southeastern Aegean Sea in protest against new tax regulations that require fishermen to pay a value-added tax (VAT) on their catches. This revision is part of Greek efforts to align national laws with the European Community, and places fishermen in a different tax category from farmers.

Oil spoils

A ruptured oil pipeline, operated by Mobil Corp. and serving the Qua Iboe terminal in Akwa Ibom state, **Nigeria**, released about 40,000 barrels of light crude oil about three miles offshore into Nigerian coastal waters. Several small fishing villages have been affected, with residents

reporting fish mortality and damage to fishing gear.

Dutch courage

Nutreco Holding NV, a company from the **Netherlands**, has announced acquiring a Chilean hatchery and fish farm from Caican, with the potential for 3.5 million juvenile salmon from the hatchery and 2,000 tonnes of market-ready salmon from the fish farm. Nutreco's annual revenues from fish farming and fish feed operations in Chile was reported to total about 300 million guilders (about US$145 million).

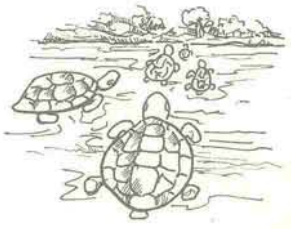
Chile chided

Meanwhile, the US Department of Commerce made a preliminary antidumping determination on salmon from Chile, with two of the five companies surveyed assessed duties of 8.27 per cent and 3.31 per cent. The other three companies surveyed were found to have dumping margins so low that no retaliatory tariffs were levied. More than 35 additional Chilean companies will have the average finding, 5.79 per cent, levied as an import duty on their product. This is substantially lower than the 42 per cent duty sought by US salmon farmers. Further investigations will be conducted in Chile before a decision on any final duty is made in late May.

Turning turtle

Biologists and environmentalists in **Nicaragua** have asked for international support to protect one of Nicaragua's (and the world's) most important nesting beach for the olive ridley sea turtle, Playa La Flor National Wildlife Refuge. The olive ridley is an endangered species protected under the Convention on International Trade in

Endangered Species (CITES) and several other international treaties. Nicaragua is home to two critical nesting sites for this species at Playa La Flor National Wildlife Refuge and Chococente National Wildlife Refuge. These beaches are two of only approximately six such sites in the Eastern Pacific.



Leatherback sea turtles also nest at the site regularly and green and hawksbill sea turtles have also been reported to nest there occasionally. Recent information suggests that Playa La Flor is threatened by a hotel construction project which has already brought and dumped many truckloads of river rock inside the reserve. Concerned activists have been sending letters of protest to the President of Nicaragua, asking him to ensure protection of the wildlife refuge.

Red China

Hong Kong officials recently closed five popular beaches because of red tides of *Gyrodinium aureolum* or *Gymnodinium mikimotoi*. These tides were also said to have killed around 1,500 tonnes or about as much as half of Hong Kong's annual farmed fish production. These tides began in mid-March 1998, and are claimed to have caused at least US$32.3 million damage to 80 per cent of Hong Kong's 1,500 fish farms.

However, government officials estimate the loss at only about US$10.3 million. About 100 fish farms were provided with emergency subsidies of about US$1,282 each. Officials of the Agriculture and Fisheries Department deemed the fish safe to eat, but Health Department officials advised caution.

About 500 tonnes of dead fish had been collected and dumped in landfills. The Hong Kong government announced efforts to develop a red tide monitoring and warning system. The red tide has since spread to neighbouring Guangdong province,

where more than 350 tonnes of fish were reported killed. The economic loss was estimated to exceed US$4.3 million. In addition, more than 328 acres of shellfish beds were reported to have been ravaged.

China sees red

Fishery officials in **China** have announced that China will ban fishing in its coastal waters from 15 June 1998 to 15 September 1998, to protect declining fish stocks. This ban period is longer than the two-month annual closure imposed from 1995-1997.

Holding hands

A flurry of co-operation. **Iran** and **Venezuela** have agreed to co-operate in fisheries and fish farming, through an exchange of scientific and technical expertise.

Japanese officials have announced a US$3 million grant to the government of **Jamaica** for the development of small-scale fisheries.

Elsewhere, Forbes & Company, the US multinational based in Rhode Island, has offered to invest US$519 million over five years in a fisheries development project by the **Pakistan** government.

The project includes port development, processing plant construction, a fleet of fish trawlers, and a shipyard.

El Niño again

Thanks to El Niño conditions, fishmeal production in **Peru** for the first two months of 1998 was almost 81 per cent lower than for the same period in 1997 (72,400 tonnes vs 376,200 tonnes), while fish oil production had fallen more than 87 per cent for the same period (6,200 tonnes vs 48,700 tonnes).

Gasping in Gaza

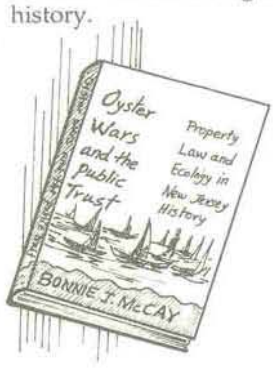
Patrolling by Israeli gunboats is preventing fishermen from the **Palestine**-ruled Gaza Strip from setting out to fish in the eastern Mediterranean. **Israel**, however, says its presence discourages guerrilla activity in the Gaza Strip.

The 1993 peace agreement between the Palestine Liberation Organization and Israel limit Gazan fishermen to 32 km off their coast. But the number of Gaza fishermen has more than doubled in recent years to cross 2,000.

Prior to the peace agreement and self-rule in the Strip, Gaza fishermen used to trade with their Egyptian counterparts at sea.

Oyster wars story

Bonnie J. McCay, professor of anthropology and ecology at Rutgers University, has just published *Oyster Wars and the Public Trust: Property, Law and Ecology in New Jersey History*, a book which deals with historical and legal anthropology, institutional economics and resource management, and environmental and legal history.



Calling it a "footnote that got away," McCay says her work explores the "archaeology of the idea of public trust, and its relations to other cultural symbols and sentiments, including the free right to fish, on the one hand, and the sacred right of private property, on the other."

The Fish, the Man and the Spirit

You strange, astonished looking, angel-faced,
Dreary-mouthed, gaping wretches of the sea,
Gulping salt-water everlastingly,
Cold-blooded, though with red your blood be graced,
And mute, though dwellers in the roaring waste;
And you, all shapes beside, that fishy be—
Some round, some flat, some long, all devilry,
Legless, unloving, infamously chaste;
O scaly, slippery, wet, swift, staring wights,
What is't ye do? What life lead? Eh, dull goggles?
How do ye vary your vile days and nights?
How pass your Sundays? Are ye still but joggles
In ceaseless wash? Still naught but gapes, and bites,
And drinks, and stares, diversified with boggles.

A Fish Answers

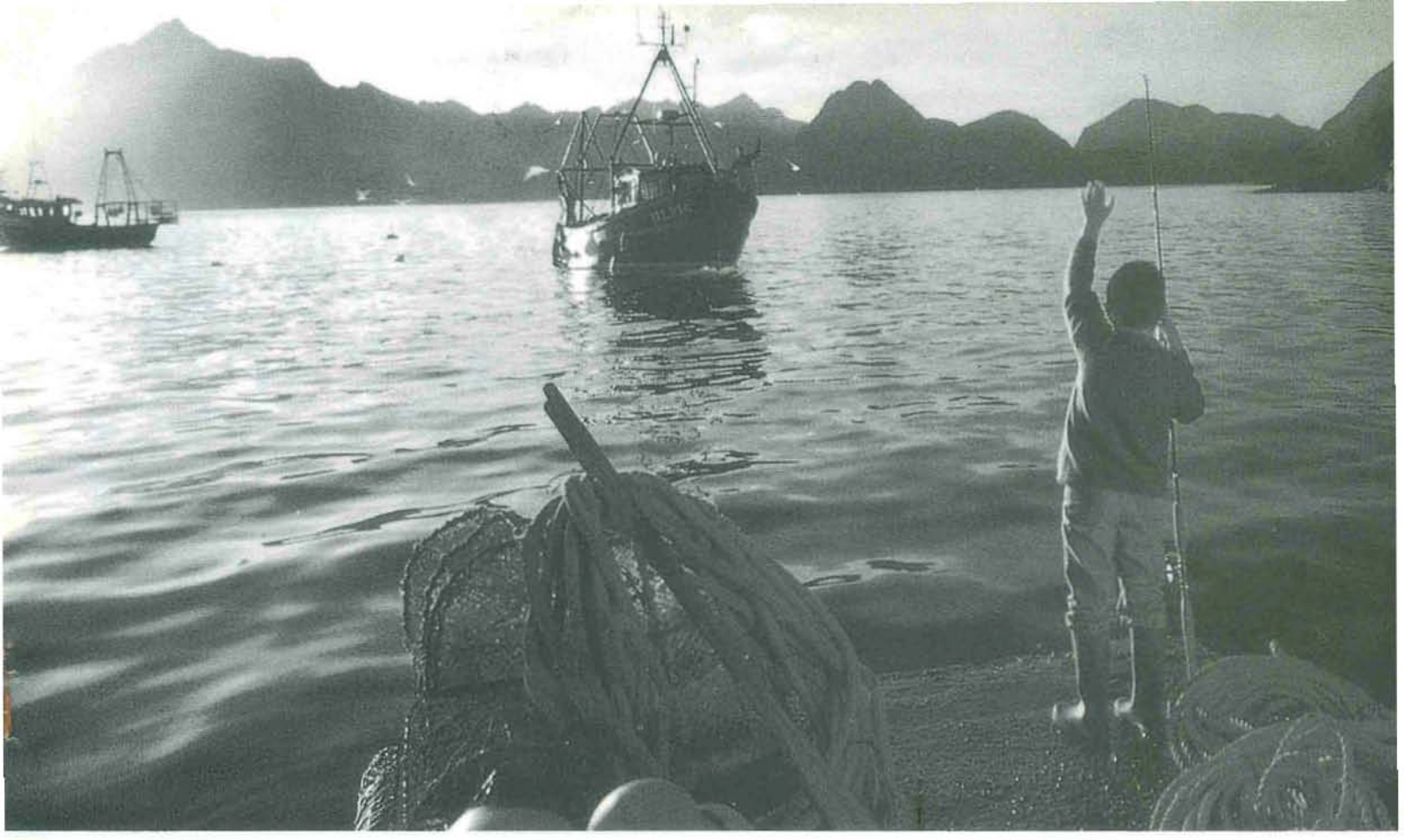
Amazing monster! that, for aught I know
With the first sight of thee didst make our race
For ever stare! O flat and shocking face,
Grimly divided from the breast below!
Thou that on dry land horribly dost go
With a split body and most ridiculous pace,
Prong after prong, disgracer of all grace,
Long-useless-finned, haired, upright, unwet, slow!
O breather of unbreathable, sword-sharp air,
How canst exist? How bear thyself, thou dry
And dreary sloth? What particle canst thou share
Of the only blessed life, the watery?
I sometimes see of ye an actual pair
Go by! linked fin by fin! most odiously.

The Fish Turns into a Man, and then into a Spirit, and Again Speaks

Indulge, thy smiling scorn, if smiling still,
O man! and loathe, but with a sort of love;
For difference must its use by difference prove,
And in sweet clang, the spheres with music fill.
One of the spirits am I, that, at his will
Live in whate'er has life — fish, eagle, dove —
No hate, no pride, beneath nought, nor above,
A visitor of the rounds of God's sweet will.

Man's life is warm, glad, sad, 'twixt loves and graves
Boundless in hope, honoured with pangs austere,
Heaven-gazing; and his angel-wings he craves:
The fish is swift, small-needing, vague yet clear,
A cold, sweet, silver life, wrapped in round waves,
Quickened with touches of transporting fear.

—Leigh Hunt (1784-1859)



ICSF

ICSF is an international NGO working on issues that concern fishworkers the world over. It is in status with the Economic and Social Council of the UN and is on ILO's Special List of Non-Governmental International Organizations. It also has Liaison Status with FAO. Registered in Geneva, ICSF has offices in Chennai, India and Brussels, Belgium. As a global network of community organizers, teachers, technicians, researchers and scientists, ICSF's activities encompass monitoring and research, exchange and training, campaigns and action, as well as communications. SAMUDRA REPORT invites contributions and responses. Correspondence should be addressed to the Chennai office.

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Sebastian Mathew for
International Collective in Support of Fishworkers
27 College Road, Chennai 600 006, India
Telephone (91) 44-827 5303 Facsimile (91) 44-825 4457
E-mail: mdsaab06@giasmd01.vsnl.net.in

ICSF Brussels Office:
65 Rue Grétry, B-1000 Brussels, Belgium
Telephone (32) 2 -218 1538 Facsimile (32) 2-217 8305
E-mail: gilletp@skypro.be

Edited by
SAMUDRA Editorial

Designed by
Satish Babu

Illustrated by
James S. Jairaj

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Michael Bortei-Doku

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