

Incredulous, Expecting Occupancy

A Review of the Situation Facing Artisanal Fishworkers at the Beginning of the 21st Century

Missing the Sea

Something removed roars in the ears of this house,
Hangs its drapes windless, stuns mirrors
Till reflections lack substance.

Some sound like the gnashing of windmills ground
To a dead halt;
A deafening absence, a blow.

It hoops this valley, weighs this mountain,
Estranges gesture, pushes this pencil
Through a thick nothing now,

Freights cupboards with silence, folds sour laundry
Like the clothes of the dead left exactly
As the dead behaved by the beloved,

Incredulous, expecting occupancy.

--- Derek Walcott

Fishing as a Livelihood is as Old as Human History

Fishing is among the most ancient of occupations, and men and women of coastal communities have, for generations, derived their livelihood from fishing and related activities. The world's first 'maritime people' are considered to be the Maglemosians, during the Mesolithic era around 10,000 years ago. Evidence indicates that maritime societies existed in Africa, along the mouth of the Nile, 8,000 years ago. Salted, dried and pickled fish was the staple food of the Greeks and of rest of the Mediterranean countries.

In ancient times, bread and fish, together with olive oil and wine, formed the most substantial parts of the diet of both rich and poor. But fresh fish was quite expensive and beyond the reach of the poor. The Greek biographer Plutarch (50-120 A.D.) reports the complaint of Cato the Censor (234-149 B.C.) that "a fish sells for more at Rome than a cow, and they sell a cask of smoked fish for a price that a hundred sheep plus one ox in the lead wouldn't bring, cut in

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Something removed near in the case of this house.
Hangs its stripes without, same mirror
The reflector lack substance

Some sound like the grating of windmills ground
To a dead fish
A desolating absence, a blow

It keeps the valley, weighs this mountain
Estuaries gears, pushes this pencil
Through a track nothing new

Friction supports with silence, folds your laundry
Like the clothes of the dead left exactly
As the dead bring back the dead

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Fishing as a Livelihood is an Old as Human History

Fishing is among the most ancient of occupations, and men and women of coastal communities have for generations derived their livelihood from fishing and related activities. The world's first maritime people, we considered to be the Mesopotamians, during the Mesolithic era around 10,000 years ago. Evidence indicates that maritime societies existed in Africa, along the mouth of the Nile & other rivers, where they fished and pickled fish was the staple food of the Greeks and of rest of the Mediterranean countries.

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Obviously, any understanding of the fishery and of coastal fishing communities must take into account the roles and work of the women, alongside the fishermen and children of these communities. Being part of the sector in important ways, women are not only directly influenced by the kind of technology and management practices adhered to at sea, they also influence what happens within the fisheries.

A Feminist Perspective Questions the Dominant Discourse on Development and Fisheries Management

While the nature of women's work within the fisheries differs, the common factor is that it is rarely seen as "productive". It has low social value and is normally seen as an extension of the "domestic" space. Little value is attached to the domestic and community tasks performed by women. It is important that we recognize the value of what is largely invisible--including nature and its resources--but which we all know has intrinsic worth.

There needs to be a central focus on the concept of "production". This needs to be understood to refer to both the production of commodities *and* the production of life, generally called "reproduction". In mainstream discourse, the production of life is considered something "natural" and is relegated to the private sphere and, therefore, is considered to have no real cost. It remains invisible. Bringing this vital aspect back into the reckoning will call for a recognition and valuation of the labour that goes towards the creation and sustenance of life, a large part of which is performed by women. This would also call for an appropriate valuation of, and respect towards, nature and its resources.

A feminist perspective would then question mainstream thinking on what is valuable and what is not, and raise vital questions such as: Is the value of women's work less because it is not reflected in economic data and is not valued by mainstream society and discourse? Is the value of the services provided by nature less because it is not "counted" in mainstream economic analysis? Is the value of artisanal fisheries any lesser because its contribution is underrated?

By restoring the value, by bringing into the matrix the "invisibles", development priorities will be reshaped. There will be a rethink on issues such as the use of technologies, which may bring in higher incomes for a few in the short run, but which affect the quality of life of communities and the sustainability of resources, in the long run.

Restoring the value to certain types of work and roles, hitherto undervalued and taken for granted, should also lead to a redistribution and sharing of these roles, and a reshaping of gender relations. That would then make it possible to move towards a vision of healthier and more viable fishing communities and fisheries that are sustainable.

But this will also mean questioning the dominant discourse and those who set the terms for this discourse, as well as redefining what is valuable. Redefining what is valuable will also mean redefining the power relations that exist between the rich and poor, between men and women, between races and nationalities.

A feminist perspective will, therefore, raise vital questions on the current development paradigm, on mainstream thinking and on technology, and attempt to make visible the links between these

pieces." Since fish was an essential item in the diet of the people, governments tried to ensure regular supply. The fishermen had to guarantee a stipulated supply to the government and could sell only what was caught in excess.

Fish Nourishes the Poor

Fish provides a vital source of protein to millions of people all over the world. As global fish production increased from 21 million tonnes in 1950 to 120 million tonnes in 1995, the quantity of fish available for direct human consumption went up to about 80 million tonnes. However, the worldwide per capita consumption of seafood, which was 9 kg in 1950, has actually declined from a peak of 19 kg in 1989 to 14 kg in 1995, as a result of expanding demand and limited supplies. Not surprisingly, international prices for seafood have been rising by 4 per cent per year in real terms over the last decade.

In 1994, at an average of 27.9 kg per person per year, people in industrial countries consumed three times as much fish as did people in the developing world (9.2 kg per person per year). Yet people in developing countries rely on fish for a much larger portion of their animal protein than do people in industrial countries. It is the prime source of animal protein for more than one billion people in developing countries. People in some countries, such as North and South Korea, Maldives, Ghana, Indonesia, Congo, Malawi and the Philippines, depend on fish for more than half of their animal protein needs.

According to an FAO estimate made in 2000, there are about 36 million fishworkers in the world and 80 per cent of them live in Asia. Sixty per cent of the global population of fishworkers are in marine capture fisheries, 25 per cent in inland and marine aquaculture and the remaining 15 per cent in inland capture fisheries. China, India, Vietnam, Indonesia, Bangladesh and the Philippines have the largest number of fishworkers in the world.

The Last Five Decades of the 20th Century Have Been Revolutionary

For fisheries, the last five decades of the 20th century have been extraordinary. From 1950 to 1990, there was a five-fold increase in fish catches. This revolutionary growth sprung mainly from the rapid development and expansion of industrial fisheries, and the globalization of the market for fish. In the latter case, the development of industrial food production (or factory farming) led to a rapid increase in demand for fishmeal as one of the main protein sources for animal feed. About 30 per cent of the global fish catch is converted into fishmeal and oil, mainly for cattle, pig, poultry and, increasingly, fish. Aquaculture now consumes 40 per cent of the world's fish oil and a third of the world's fishmeal, with nearly a quarter of all the world's fish supplies being diverted to support fish farming.

On the consumer side, the market for fish has developed rapidly, mainly in countries of the North. Around 40 per cent of the fish catch enters international trade, and Northern countries account for 90 per cent by value of the imports of fish (USA, Japan and the EU accounting for 77 per cent). While this has provided artisanal, small-scale and traditional fisheries with market opportunities, there is a flip side to the story. In many cases, the increasing demand has only fuelled the growth of non-selective and environmentally destructive fishing practices, like bottom-trawling in tropical waters for shrimp.

As Technology Gets More Sophisticated, Fish Production Stagnates

Developments in the fishery sector in the post-Second World War period have been characterized by the rapid growth in technology. Large vessels employing sophisticated technology for finding and catching fish were responsible for the huge increase in fish production in the 1960s and 1970s. However, several important fisheries have been overfished, catches of important commercial stocks are declining, and marine fish production appears to have peaked.

In 1998, total world fisheries production, including both capture fisheries and aquaculture production, stood at 117 million tonnes. This comprised 86 million tonnes from capture, and 31 million tonnes from culture fisheries. China was the biggest producer (44 million tonnes), followed by Japan (6 million tonnes) and India (5 million tonnes), thus all the top three producers were Asian countries. Asia was also the biggest producer of fish in the world, and contributed to 68 per cent of world production. This included 43 million tonnes from capture and 27 million tonnes from aquaculture.

Of the top seven fish producing countries in the world, five were developing countries and three were from the Asian region (China, India and Indonesia respectively). China alone contributed to 32 per cent of the world total. However, because of their large fishers' populations, the per capita share of marine fish production of China, India and Indonesia is quite low 1.7, 0.5 and 1 tonne respectively (1998 figures).

The difference is very striking when we compare these developing countries with Nordic countries. For the same year, Iceland, for example, had a per capita marine production of 334 tonnes, Denmark 325 tonnes and Norway, 125 tonnes. The difference is quite stunning when we look at the export figures. When China, India and Indonesia had per capita export earnings of U.S.\$300, U.S.\$190, and U.S.\$790 respectively, Iceland, Denmark and Norway had U.S.\$285,400, U.S.\$600,000 and U.S.\$161,440 respectively.

After showing a 6 per cent annual growth rate in the 1950s and 1960s and a 2 per cent growth rate in the 1970s and 1980, the world capture fisheries production has levelled off in the 1990s (FAO 2000). Most of the fishing areas in the world have reached their maximum potential for capture fisheries production. For stocks for which information is available, about 10 per cent have been depleted, 65 per cent are either fully exploited or overexploited and the rest are under- or moderately exploited. Only areas with some potential for production increases are the Eastern and Western Indian Ocean and the Western Central Pacific.

Since capture fisheries have reached their limits, any long-term rise in the value of exports, according to FAO, depend, to a significant extent, on increased aquaculture production or product prices. In the 1990s, the annual growth rate in aquaculture production went up to 10 per cent, from 5 per cent to 8 per cent since the 1950s. Most of this increase in aquaculture production took place in Asia. As a result, since the 1980s the Asian region has been experiencing the most rapid growth rate in fish production, compared to other continents.

Statistics Give A False Sense of Security

FAO estimated that by 1994, 35 per cent of the 200 major fishery resources were senescent (i.e. showing declining yields), about 25 per cent were mature (i.e. plateauing at high-exploitation levels), 40 per cent were still developing and none remained at low-exploitation levels (undeveloped). This indicates that around 60 per cent of the major world fish resources are either mature or senescent and are in urgent need of management action to halt the increase in fishing capacity or to rehabilitate damaged resources. There has been a gradual increase in the estimated number of stocks requiring management, from almost none in 1950 to over 60 per cent in 1994. This also underlines the fact that figures of rising world fishery production give a misleading vision of the state of world fishery resources and a false sense of security. Statistics indicate that catches in most fishing areas, with the exception of the Indian Ocean and the South-East Pacific, are declining.

Similarly disturbing is the fact that, as a result of the overfishing of many species at the higher level of the food chain, the composition of global catches has shifted to smaller, bonier fish at the lower end of the food chain. The proportion in weight of the total marine fish landings accounted for by pelagic fish (generally small, short-lived species that travel in schools in the open ocean, and which, with the exception of high-priced tuna and other large pelagics, are relatively low-priced fish) has risen from about 50 per cent in 1950 to over 60 per cent in 1994. Global landing of pelagic fish have shown an underlying upward trend since 1950. In contrast, landings of higher-value demersal species showed an increasing trend until the mid-1970s and have since generally levelled off. In parts of the Atlantic and the Pacific Oceans especially, landings of demersal fish have been declining. FAO points out that, while environmental factors have almost certainly played a part in some declines (e.g. in Northwest Atlantic), overfishing has been a major factor responsible for declining production.

Overcapacity Comes from Too Many Boats Chasing Too Few Fish

It is widely acknowledged that the problem of overfishing, in general, and overcapacity, in particular, is threatening the sustainability of the world's fisheries resources for present and future generations. According to the FAO, between 1970 and 1989, the total gross registered tonnage (GRT), a measurement of volume, of world fishing fleets increased by an average of 4.6 per cent a year. During the same period, total world fisheries landings increased at an average of 2.4 per cent annually. Thus, the world fishing fleet grew about two times as fast as the landings.

Another estimate for the same period indicates that the GRT of world fleets increased by 90 per cent, while the technical capabilities of the world fleet as a whole increased more than three times as fast, by 330 per cent, signifying a massive escalation of fishing power and effort. Despite the investments and improvements in fishing technology and harvesting capacity and the growth in world fish catches, landings per gross registered ton (catch rate) declined by 62 per cent overall during these two decades. Large boats were catching less for the same amount of effort—a direct consequence of overcapitalization. It is estimated that Iceland and the European Union (EU) could cut their fleets by 40 per cent and Norway by 66 per cent, and still catch the same amount of fish.

At the international level, the problem of excess fishing capacity and the need to control fishing effort have been recognized (consider, for example, the Rome Consensus on World Fisheries, 1995; the FAO Code of Conduct for Responsible Fisheries; the 1995 UN Agreement on

Straddling Fish Stocks and Highly Migratory Fish Stocks; and, the Kyoto Declaration, among others). FAO analysts recommend a reduction in fishing capacity between 25 and 53 per cent, depending on price increases or cost reductions.

The reality, however, remains different. A study by John Fitzpatrick and Chris Newton in May 1998, supported by the environmental NGO, Greenpeace, focusing on vessels larger than 24 m and over 100 GRT, notes that the world's fishing fleets have continued to expand over the period 1991-97. Throughout the period, additions to the world's fleet continue to exceed deletions. 1549 new vessels (of 24 m and over and 100 GT or larger) were added between 1991-95, of which four States accounted for 53 per cent (and the EU, 16 per cent). Another 105 vessels were built in 1996. Evidence, therefore, indicates that fishing fleets are not being restructured and that the problem of overcapacity continues as States with open registers increase their capacity.

Technomania Repeats the Mistakes of the Past

New fishing vessel construction trends show more vessels are being built with technology used to fish either large amounts of relatively low-valued species, or widely distributed species that are at depths which were previously beyond technological and economic reach. Modern construction is being specialized toward large vessels using gigantic mid-water trawls, highly specialized auto long-lines of up to 50,000 hooks and deep water fishing with trawls/longlines on sea mounts and in deep ocean ridges.

The efficiency, or fishing power, of fishing vessels is also increasing. Newton and Fitzpatrick estimate that a large factory trawler (supertrawler) built in 1995 has two and a half times the fishing power of a similar sized factory trawler built in 1980 and over four times the fishing power of a vessel built in 1970. Between 1980-1995, fish finding and catching technology increased rapidly, not only to more advanced electronics and hydraulic equipment, but in refrigeration, fuel efficiency, remote sensing equipment and improved vessel design configurations. Their calculations show that, while the world's fishing fleet increased by three per cent in terms of tonnage between 1992 and 1997, the world's fleet actually increased by 22 per cent in terms of potential fishing capacity through new additions to the fleet and refits. In order to relieve fishing pressure on overexploited stocks and help their recovery, they call for a reduction of at least 50 per cent in the size of the industrialized fleet.

Flags of Convenience Dot the Oceans, Dodge the Rules

Newton and Fitzpatrick's analysis also shows that the number of vessels flying "flags of convenience" continues to rise. More countries are offering their flags than ever before. Reflagging enables vessel owners to "dodge the rules" to avoid conservation and management measures which their own flag States might otherwise enforce.

Greenpeace further estimates that a relatively small number of fishing vessels makes up about half of the total capacity of the world's entire fishing fleet (13 million GRT of roughly 26 million GRT on the seas today). These are the approximately 35,000 ships (or one per cent of the total number of about 3.5 million fishing boats) that can be classified as large-scale, industrialized fishing vessels. Broadly speaking, this is seen a class of vessels that weigh over 100 gross registered tonnes (GRT). As a general rule, 100 GRT vessels correspond to an approximate

length of 24 metres.

Greenpeace estimates that these 35,000 vessels catch between half and two-thirds of the world's reported catches from world fisheries (almost all the fish caught for reduction to fishmeal and oil and about half the fish caught for human consumption). It, therefore, recommends that the greatest conservation benefits can be achieved by substantially reducing the large-scale fleet.

Faced with Overcapacity, the Industrialized North Exports Its Fishing Capacity

With severe overfishing and overcapacity in the Northern hemisphere, industrial countries are now willing to pay a high price for access to the Exclusive Economic Zones (EEZs) of Southern countries. Such subsidies both discourage the exit of fishing vessels from troubled fishing industries and encourage overfishing in the economic zones to which access is subsidized.

The fisheries access agreements between the European Union (EU) and African countries are striking examples of subsidized access to foreign fishing grounds. These agreements have permitted the EU to redeploy large numbers of fishing vessels from overfished EU fishing grounds to those of African countries. The first agreement was signed in 1979 and, since then, the EU has created a network of fishing access agreements with 19 African countries. As of 1996, the compensation paid to African countries under these agreements amounted to at least \$229 million annually—representing 43 per cent of the entire annual EU budget for fisheries restructuring during the 1994-99 period—primarily for the benefit of French, Portuguese, and Spanish fishing companies, thereby exporting the overcapacity problem from North to South.

By the early 1990s, the investment by the EU in access to African fisheries had achieved the effective redeployment of some 1000 vessels to African waters. The bulk of the EU fleets cost of access is paid by the EU through its compensation package to the country. Vessel owners, in contrast, pay only a fraction of the total cost of access. While the compensation package paid by the EU as a contribution to the cost of access is an explicit subsidy, the low licence fees and arbitrarily low assumed annual catch for tuna vessels in the agreements represent an implicit subsidy.

From the point of view of African nations, debt service is the key motivation for annual renewal of access agreements. States in Sub-Saharan Africa earn substantial revenues in hard currency from various types of compensation, royalties and fees from fishing agreements negotiated with non-coastal countries. It is estimated that, in 1993, gross revenues and compensations (licence fees excluded) from fishing agreements in force between the EU and Sub-Saharan African States amounted to nearly US\$ 300 million.

However, vessels fishing under fisheries access agreements are known to violate the provisions of the agreement. For example, catches (which form the basis for future agreements) are regularly under-reported. Enforcement of the few environmental provisions that do exist is generally scant, and conflicts with the local artisanal fleet are common.

Aquaculture and Trade Are Set to Dominate Future Fisheries

FAO forecasts for the first quarter of the twenty-first century a scenario where aquaculture will dominate fish supplies, edging out capture fisheries to the second slot. With their competitive

labour markets, developing countries will dominate both fish production and processing. Trade, as a result, will play a greater role, with the OECD countries becoming greater importers of fish and fish products. With significant dependence of rich countries on fish supplies coming from the developing world, FAO speculates that most trade barriers in the OECD countries will be removed by the year 2030.

In 1998, about 40 per cent of global fish production entered international trade. In the absence of effective fisheries management, several fisheries that enhanced production in response to demand have been overfished. Examples come from both developed and developing countries. Trochus, *beche de mer*, and giant clam fisheries in the Pacific, Atlantic Cod fisheries in Newfoundland, Canada, Alaska Pollock fisheries in the United States and Argentine Hake in the Argentinean waters are examples of overfishing. It is instructive to note that most of the overfishing pressures worldwide are on stocks that are slow reproducing and easily accessible, or stocks that are fished with highly efficient bottom trawls.

Even if, as FAO predicts, aquaculture will make the single largest contribution to fish production in the 21st century, fish from capture fisheries are bound to enjoy better market prices in world market if the current price differential between culture and capture fisheries products is taken as an indication for the future.

Subsidies Contribute to Overcapitalization of Fishing Fleets

According to the FAO, subsidies are one of the primary reasons for the overcapitalization of fishing fleets. In 1993, FAO estimated the costs of, and the revenue from, fishing. It estimated that the fishing industry received subsidies worth approximately US\$54 billion, i.e. the difference between the value of the catch, estimated at US\$70 billion, and the cost of fishing this, estimated at US\$124 billion.

A more recent assessment indicates that subsidies are more likely to be in the range of US\$16-22 billion each year. Using data from the few governments that keep track of these expenditures—China, the EU, Japan, Norway, Russia, and the United States—the estimate found that global fishing subsidies in 1995 totalled \$14 to \$20 billion. Between \$3.0 and \$3.5 billion were budgeted specifically for domestic fishing subsidies, plus \$1 billion for buying access rights in foreign waters. Tax breaks and lending totalling \$3 billion acted as subsidies for buying fishing boats and gear. An additional \$7 to \$11 billion came from unbudgeted subsidies and low-interest loans and tax preferences for shipbuilding, harbour development, and related infrastructure projects. Based on these data, 20 to 25 percent of current global fishing revenues come from subsidies. This is seen as a conservative estimate, since, for instance, it has taken only an incomplete account of environmental externalities, and not all countries are included in the reckoning. It is also likely that countries like Japan, China and Russia are under-reporting their subsidies.

Many governments today continue to give fishers immense amounts of subsidies. Most of this money actually bolsters fishing capacity and upgrades existing boats, thus encouraging fishers to try to catch even more fish. Given that most of the world's fisheries are already depleted or under heavy pressure, the continuance of subsidies only exacerbates the problem, as State support goes primarily towards paying for more and bigger boats, or more advanced technology and

equipment, such as radars and remote sensing devices. They favour, for the most part, large-scale fishers over smaller-scale fishers.

Subsidies Should Instead Contribute to Sustainable Fisheries

It has been suggested that subsidies that lead to overcapacity should be dismantled. The emphasis could instead be on environment-enhancing subsidies that contribute to a sustainable fishery. Subsidies could also be redirected to help reduce fishing capacity, while increasing employment at the same time, thereby minimizing negative social impacts. For instance, the more highly mechanized ships can be phased out and the funds thus released could be used more productively. It has been estimated that each US\$1 million of investment in industrial-style fishing provides only 1-5 jobs, whereas the same investment in small-scale fisheries could employ anywhere from 60 to 3000 people. For example, half of the United States bluefin tuna fishery is now allocated to the least capable gear such as handlines or rod-and-reel, so that almost 80 per cent of jobs are supplied by ships with labour-intensive tackle, in contrast with 2 per cent on the part of ships with larger tackle.

Multinationals, Backed by Financial and Political Muscle, are Increasingly Dominating Fisheries

Investments geared towards increasingly efficient and high-cost technology keeps pace with the race for limited fish stocks. In view of the huge requirements of capital, fisheries production, marketing and processing are increasingly dominated by multinational corporations (MNCs). For example, Resource Group International (RGI), a conglomerate, controls almost 10 per cent of the world's whitefish (cod, hake and pollock) production, with operations concentrated mainly in Alaska, South America and Russia. It has a fleet of 37 modern vessels—one of the largest and most efficient fishing fleets in the world, consisting primarily of factory trawlers and longliners. Similarly, the Spanish company Pescanova accounts for 20 percent of world hake production. Set up in the 1960s, the group embarked on an ambitious expansionist strategy forming joint ventures with countries like South Africa, Namibia and Mozambique. Today, Pescanova owns a fleet of more than 140 boats (mostly freezer trawlers), seven factories and 25,000 retail outlets.

Large multinational companies such as these have the required financial backing and political influence both to pressure their own governments to underwrite their efforts to remain financially solvent and to persuade foreign governments to give them cheap access. For example, RGI managed to obtain a sum of grant monies from the Norwegian government in 1995/96 to build 16 new factory freezer for Russia, exceeding all the monies granted to the entire Norwegian coastal fishery put together.

High Rates of Discards and By-catch Add to Inefficiency

Substantial by-catch and discards have been reported in large-scale and medium-scale fisheries. It has been estimated by the FAO that discards worldwide total at least 27 million tonnes per year, equivalent to one third of fish landings. This amount is likely to be higher, since fishers have little incentive to report discards and by-catch. In all demersal (bottom) trawl fisheries, by-catch rates are unacceptably high, with unknown damage inflicted on life-supporting benthic ecosystems. Trawling for shrimps is particularly problematic and it is estimated that, at times,

shrimps make up as little as 10 per cent of the total catch.

The introduction of quota management has encouraged 'monospecies fishing', targeting single species of high commercial value. This leads to a high rate of discards, as non-target species, small fish and over-quota fish are thrown overboard or landed and sold illegally in the black market as 'black fish'. Quota management has prompted the practice of high-grading, whereby fish of the highest quality and economic value is retained, while discarding fish of a lower value and quality, so that the total quantity declared is kept within quota limits.

Fish Eat Fish, As Fishmeal Production Grows

About one third of global fish production—almost 30 million tonnes—is transformed into fishmeal and oil. Technological growth (more efficient purse-seines and fish detection devices), combined with increasing demand, has led to the increase in industrial fishing, which almost exclusively targets small pelagic species, such as anchovies, sardines and horse mackerel. The demand for fishmeal comes primarily from the agriculture sector (intensive pig and poultry farms). However, with the increasing popularity of soya substitutes for pig and poultry rearing, the demand for fishmeal is increasingly from the aquaculture sector.

Over half the world's fishmeal comes from Peru, Chile and Japan. Southern countries supply half the world's fishmeal and are responsible for 70 per cent of its international trade. While imports into Northern countries have been stable of late, imports into those countries of the South that are promoting intensive shrimp aquaculture systems, such as China, Philippines and Thailand, has been going up.

The transformation of fish into fishmeal leads to a loss of protein—around five tonnes of fish are used to produce a single tonne of fishmeal. Moreover, when fish is consumed by poultry, cattle, fish or shellfish, a further loss of protein occurs. For example, about 2.7 kg of fishmeal (made from 15 kg of fish on an average), make up one element of the total feed mix, which contributes to the production of a salmon weighing 3 kg.

It is important to raise the question as to whether the conversion of fish to fishmeal take away fish that could possibly be used for human consumption. Some researchers argue that part of the catch reduced to fishmeal can go to feed human populations, providing some investment in appropriate processing technology is made. They allege that conversion to fishmeal is basically in response to the greater purchasing power of cattle and pigs raised in the North, and of high-value aquaculture species (such as shrimp) also marketed in the North.

It has also been pointed out that the future of industrial fisheries targeting fishmeal species appears to be linked in no small way to the future growth in the intensive culture of carnivorous species, like shrimp and salmons. This is because soya substitutes are increasingly replacing fishmeal as feed for cattle, poultry and pig rearing. The projected future demand for fishmeal is mainly from the rapidly growing aquaculture industry.

Will Aquaculture be the New Face of Fisheries?

Aquaculture is the practice of farming aquatic plants and animals, including fish, molluscs, crustaceans and aquatic plants in a modified environment. Farming implies some form of

intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators etc. Broadly, it ranges from intensive aquaculture, which involves a high degree of control over the production process and the use of external inputs such as feed and fertilizers, to extensive and traditional aquaculture systems, which require few, if any, external inputs and minimal manipulation of natural production processes.

Aquaculture has been traditionally practiced in Asian countries, often as part of integrated farming systems that are well integrated with the local environment and within the bonds of available resources. However, in recent years, there has been a rapid expansion of intensive monoculture systems raising predominantly carnivorous, highly profitable species that demand large amounts of feed, water and fertilizers. Many high-value species are now raised primarily for export.

The production of shrimp, for example, one of the most profitable commodities in aquaculture, is increasing. In 1995, brackishwater shrimp species contributed to almost 5 per cent of total aquaculture production. In Bangladesh, Ecuador, Indonesia, and India, as well as the more established shrimp-farming countries of Thailand and China, shrimp culture comprised a \$6.3 billion industry and yielded a major export product. However, shrimp culture has been responsible for several environmental and social problems in these countries, such as mangrove destruction, conversion of farm lands to aquaculture ponds, pollution and salinity incursion, even as the industry itself as suffered several setbacks due to disease outbreaks.

While high-value species such as cultured shrimp and salmon are primarily exported, low-value freshwater species, such as carps and tilapias, contribute importantly to food security. It is significant that most of the increase in aquaculture production has been due to the growth of aquaculture practised in freshwater environments in inland areas.

The Environment in Coastal Areas is Rapidly Degrading

Coastal, inshore waters are very productive and provide vital spawning and breeding grounds for fish. About two-thirds of all commercially valuable fish species spend the first, and most vulnerable, stages of their lives in these waters. In particular, coastal habitats and ecosystems, such as mangroves, mudflats, bays, wetlands, estuaries, saltmarshes, sea grass and seaweed beds and coral reefs, are known to be highly productive.

However, coastal fish habitats are rapidly being degraded in many parts of the world by industrial, urban and agricultural pollution, landfill, the damming and diversion of rivers, the clearance of mangrove, sedimentation, mining and oil exploration and extraction, marine-based pollution, etc. According to United Nation's Joint Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP), land-based sources account for 44 per cent of marine pollution, airborne pollution for 33 per cent (much of it originating on land), dumping of wastes 10 per cent, marine transport 12 percent and offshore production one per cent.

Pollution and habitat destruction disproportionately affect fish that spend at least part of their lives in coastal waters and habitats, and the livelihood of fishworkers. In addition, the displacement of fishing communities through competitive resource use is not uncommon in coastal areas.

While the fisheries sector suffers harm globally, it is also, itself, responsible for environmental damage. Local pollution from fishing vessels and fish processing plants can be significant. Non-selective fishing practices and gear, such as bottom-trawling and the use of fine-mesh nets, are seen as damaging to the benthic environment and to local fish stocks. They are also responsible for a high rate of by-catch and discards. A critical problem is the environmental degradation often associated with intensive, aquaculture practices, notably of tropical shrimp and salmonids in temperate zones. In tropical reefs, the use of cyanide poison is a growing threat to marine species and their habitat. Over time, such practices can kill most reef organisms and damage the reef habitat.

Clearly, there is an urgent need for integrated coastal area management programmes, that take into account the priorities and interests of stakeholders in the fishery sector.

Scales of Fishing Operations Matter

It is estimated that more than 200 million people all over the world depend on fisheries, directly or indirectly, for their income. Recent statistics indicate that more than 21 million people worldwide are fishers. The figure may be higher since not all fishermen are full-time—many of them fish part-time or seasonally, supplementing other sources of income. Almost 90 per cent of all fishers are artisanal or small-scale operators and 95 per cent live in developing countries.

Typically, the artisanal and small-scale sector may have some of the following attributes: use of small craft and simple gear of considerable diversity, but considerably low capital intensity; fishers work as share-workers or owner-operators of their fishing units; live in decentralized and spatially dispersed settlements; fish close to their home communities in relatively near-shore waters in single/day/night operation; supply local and hinterland markets; depend considerably for finances on middlemen or on those who buy their harvest; etc. With the exception of some motorization of canoes and the introduction of nylon nets, the fishing technology of small-scale fishers in the developing world remains largely unchanged.

There are a number of characteristics by which the small-scale sector may be differentiated from the large-scale sector: size of crew (the smallest crew on a small-scale fishing vessel is generally greater than the largest crew on a large-scale fishing vessel); on-board processing (many large fishing vessels include a complete processing plant while small vessels usually have limited or no processing capability); duration of voyage (small-scale vessels usually make day trips, while large-scale vessels may be away at sea for much longer periods); level of technology; etc. However, especially in countries of the North, the dividing line is not always clear cut, and there are many features, such as the use of navigational aids or fish-finding equipment, that cannot be said to be a definite characteristic of one sector rather than the other.

Small May Still Be Beautifully Efficient

States all over the world promoted an industrial model of fisheries development from the 1950s. The artisanal and small-scale sector was largely seen as backward and inefficient. However, with the crisis in world fisheries, this model of development is increasingly under scrutiny. It is being pointed out that small-scale and artisanal fisheries contribute vitally to local food security and to

employment, even as benefits from the resource are distributed more equitably within the fishing community. At the same time, artisanal fishing operations tend to be more sustainable and less damaging to the environment, since the use of passive fishing gear and techniques (such as gillnets), as against the active fishing techniques pursued by the large-scale sector (such as trawling and purse-seining), is more common.

It has also been pointed out that small-scale fisheries is much more than a business enterprise. It is also a social and cultural enterprise and a way of life for millions of people all over the world. That is why small-scale fishers will often persist in fishing, clinging to their accustomed way of life, even when the returns from the fishery decline.

A comparison of some important characteristics of the small-, medium- and large-scale sector is illuminating. Around the world, only one per cent of all fishers work in large-scale fisheries, while over 90 per cent are small-scale fishers, either using traditional equipment or operating small, relatively modern boats. It would appear that to catch a given amount of fish, small-scale fishers tend to employ more people, require less capital and produce less waste. At the same time, almost all the fish caught by the small-scale sector goes towards human consumption.

It would seem that small-scale fisheries should be central to policy-making if economic and social considerations, as well as considerations of resource conservation and management, are given due importance. This is especially so since a fundamental problem of small-scale fishers around the developing world remains their absolute and relative poverty, despite decades of fishery development and national economic growth.

How Can We Define "Traditional", "Small-scale", "Artisanal"?

What exactly do we mean by terms like "traditional", "small-scale", or "artisanal" fisheries? These terms seem to have gained currency during the post-mechanization phase in many developing countries as a descriptive characteristic of those fisheries that were not mechanized, and those fisheries that were opposed to mechanization. Traditional, small-scale or artisanal became the antonyms of "modern", "large-scale" or "mechanized", and "industrial" fisheries. These terms had political significance in some contexts where they became rallying points for fishers who were against the introduction of destructive forms of bottom trawling, especially in Asia.

However, the situation changed with the widespread adoption of motorization in small-scale fisheries all over the world. Traditional, artisanal or small-scale fisheries now include a range of fishing activities targeting sedentary molluscs in the littoral waters to highly migratory tuna stocks. According to FAO, 50 per cent of the tuna production in the Indian Ocean originates, for example, from artisanal fisheries, meaning tuna that are caught in all gears excluding purse-seines and long-lines in the distant waters. It includes subsistence fishers in the South Pacific as well as those fishing mainly for the export market, in Senegal and Chile. Its range spreads from resident women crab gleaners in the mangroves of northeastern Brazil, to Mexican long-line fishers who go up to 200 nautical miles in their 7 m fibre-reinforced plastic (FRP) boats with 200 horse power (HP) outboard motors (OBMs) in pursuit of shark, and to the migrant long-line fishers of Sri Lanka who fish the farthest points of the Indian Ocean targeting tuna and shark resources. It may be an activity that is resident or migrant; occasional, seasonal, part-time or full-

time.

Traditional, artisanal or small-scale fisheries include rudimentary 3 m dugout canoe with a crew size of just one in Madagascar, to the 18 m *piroque* of West Africa and the 16 m plywood or FRP boat of India that employ up to 40 crewmembers on board a single fishing trip, and further to shore-seines of Sri Lanka and India that would employ as many workers on shore to haul the net as a *piroque* or a plywood boat would employ on board for purse-seine operations. Artisanal fishing thus includes *highly individualized* fishing operations like cast nets and handlines; *small-crew* operations like setting traps or pots in lagoons, estuaries, or nearshore waters, diving for sedentary species in reefs and lagoons, operating a regime of gillnets and long-lines; and the *labour-intensive* purse-seining and shore-based, beach-seining operations.

The terms "traditional", "small-scale" or "artisanal" could, however, have distinct connotations in different techno-economic, political, cultural and social contexts. In Madagascar, for example, the definition of what constitutes traditional, artisanal or small-scale in an economic sense, is *fishing operation-specific*, although the definition of traditional fishing *per se* also has social overtones. This primarily applies to a small trawler sector of around 600 vessels fishing mainly for the local market. Whereas the term *artisanal* refers to motorized fishing for the domestic as well as for the international market, the term *traditional* refers to unmotorized, kinship-based fishing for subsistence or for the local market, undertaken by fishers who respect local taboos and customs.

In Fiji, the term *artisanal* is used to refer to fishing units harvesting for the domestic market; it is thus *market-specific*. In India, only the term *traditional* is legally recognized, but unlike Madagascar, it denotes traditional fishing craft. Traditional craft means a fishing craft already in use before the arrival of mechanized fishing vessels. They also include boat designs of foreign origin that were adopted during the colonial times. The definition is thus, *craft-specific*.

In Indonesia and Malaysia, the term *traditional* is used but, unlike in India, the term is used in a *gear-specific* sense. All fishing units, excluding trawling, are defined as *traditional* fishing units. In Peru, *artisanal* is the term in vogue, defined in *tonnage-specific* terms to indicate fishing vessels below 30GRT. According to *Federación de Integración y Unificación de Pescadores Artesanales del Perú* (FIUPAP) the organization of the artisanal fishers of Peru, about 85 per cent of fishing vessels in Peru are below 10GRT.

In Chile also the term *artisanal* is used to indicate vessels below 50 GRT and less than 15 m in length. In France, the term used is *artisanal*, but the definition is *length-specific*. All vessels up to 25 m in length are categorized as *artisanal* units. The term used to denote the equivalent is *inshore* fisheries in Canada, which refers to fishing vessels that are below 20 m in length. A major distinction between the North and South is that, irrespective of the size of the unit, trawling operations, in general, are not considered small-scale or artisanal in the South.

There is thus no elegant definition. The problem of defining traditional, artisanal and small-scale categories has been compounded of late because of new technical changes, *viz.*, motorization of hitherto unpowered vessels, the use of powered gear-hauling devices, ice boxes, synthetic webbing for fishing gear, and the adoption of modern miniaturized electronic aids for navigation and fish detection. We assume that the *artisanal* and *small-scale* fisheries, in general, refer to the

smallest viable fishing units in a country or a province, with downward or lateral compatibility in fishing gear operation. It refers to a specific regime of fishing craft, gear—or both—in combination, and at the bottom-end of the fishing power hierarchy in a particular fishery in a country or province. An artisanal or small-scale fisher can be defined as one recognized to originate from a fishing caste, community, or a tribe and participating in an artisanal or small-scale fishery.

Artisanal and Small-scale Fisheries Have a Special Role in Developing Countries

Artisanal and small-scale fisheries are accorded special recognition by the 1995 FAO Code of Conduct for Responsible Fisheries, and is, in fact, the only fisheries sub-sector specially mentioned in the Code. Article 6.18 of the Code states: "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 under their national jurisdiction."

The share of developing countries to world marine fish production in 1998 was 60 per cent. Of the top seven fish producing countries in the world, five are developing countries. Three of them—China, India and Indonesia—have a huge population of nearly one billion people living below the UNDP income poverty line of US\$1 a day (UNDP 1999). Artisanal, small-scale fisheries contributed to more than 25 per cent of the world catch, and accounted for 50 per cent of the fish used for direct human consumption. What is most significant about the contribution of small-scale fisheries to world fish production is that it has been achieved in spite of receiving very little subsidies from governments and insignificant development assistance from the international donor community.

According to an FAO estimate, there are about 36 million fishworkers in the world, of which 80 per cent are in Asia. Sixty per cent of the global population of fishworkers are in marine capture fisheries, 25 per cent in inland and marine aquaculture and the remaining in inland capture fisheries. The proportion of fishers to total population is highest in Vietnam and Indonesia—one in every 25 of the population is a fisher in Vietnam, and one in every 44, in Indonesia. Most of them are employed in artisanal, small-scale fisheries.

In absolute terms, China, India, Vietnam, Indonesia, Bangladesh and the Philippines have the largest number of fishers in the world. Chennai, the capital of Tamil Nadu State in India, alone has an active fishers population of 31,000. In contrast, Iceland and New Zealand put together, for example, account for less than 12,000 fishers, but their combined fish production at 2.6 million tonnes (1998 figures) equals the total marine fish production of India.

Small-scale Fisheries Have Created Jobs, Alleviated Poverty and Earned Foreign Exchange

According to the FAO, when employment in agriculture in developing countries grew by 35 per cent in the last 25 years, employment in fisheries doubled. Employment in fisheries in the OECD countries, however, suffered a one-third decline in the same period, with the exception of Iceland and Portugal. Small-scale fisheries, being an economic activity in the far-flung areas of many

coastal countries, especially in areas where alternative sources of employment are scarce, seem to have played a crucial role in employment creation, income generation and poverty alleviation, arguably because of resilient coastal fisheries where people from other less-rewarding occupations, or from occupations that cannot guarantee a basic livelihood due to factors such as drought conditions on land, immigrate. Madagascar, Senegal, Peru, China and India provide examples for this kind of migration. It has also been estimated by FAO that for every full-time fisher in the small-scale sub-sector, additional employment for about one to three persons is generated in the fisheries sector.

Since the small-scale sub-sector also targets fish for the international market, it contributes to foreign exchange earnings. The contribution of small-scale fisheries to foreign exchange revenue in many developing countries is significantly much higher than the contribution of small farmers or peasants in agriculture. Though commodity export prices of cocoa, rubber, palm oil, coffee and tea have been considerably depressed since the 1990s, that of fish exports have not. In several African, Caribbean and Pacific (ACP) countries, for example, fisheries exports, especially from the small-scale sub-sector, are now the major export earner ahead of tea, coffee, cocoa and groundnuts – e.g. Senegal Fisheries products are one of the few areas where ACP countries have seen their participation in world trade increase. Between 1976 and 1986, ACP fish exports to the EU rose from 36 MECU to 309 MECU, while, by 1996, the value of ACP fish exports exceeded 946 MECU. In the four years from 1992 to 1996, the ACP share of total EU fish imports rose from 16.4 per cent to 22.5 per cent. This contrasts with general ACP trade performance, which saw the ACP share of imports into the EU decline from 6.7 per cent to 3.4 per cent in 1994.

Conservation and Management Measures are of Paramount Importance

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs...

-Brundtland Commission

In the absence of conservation and management measures, resources can be overfished, especially when there is demand from external markets that are prepared to pay prices higher than the domestic market. The market in rich countries is likely to pay even a higher price for fish that are responsibly produced. However, with effective conservation and management measures, the market incentive can be judiciously exploited to achieve goals of employment, income, foreign exchange and food security in several developing countries. Nordic countries, and countries like Australia and New Zealand—countries with small fisher populations—have already demonstrated that effective management is a good business proposition in conjunction with programmes to enhance the value of fish production through efficient post-harvest activities.

There are strong incentives for developing countries to adopt conservation and management measures because most of the fish that the rich countries would like to consume are increasingly produced by developing countries. This calls for a proactive engagement with fisheries conservation and management issues both by the State and the industry. To set national product and process standards to access lucrative markets in other countries would imply co-ordinated

and time-bound action, especially the implementation of principles and standards for conservation of fisheries resources. This would involve acting upon international obligations under the 1982 United Nations Convention on the Law of the Sea (UNCLOS) as well as other non-binding legal instruments like the Agenda 21, the 1995 FAO Code of Conduct for Responsible Fisheries and other regional instruments of relevance to fisheries and coastal area management.

Although net earnings from fisheries exports for many developing countries are quite high, little significant investments are made in conservation and management by most developing countries. Although with a gross value of fisheries output at US\$ 5 billion in 1997-98 (at ex-vessel prices) and an export earning of over US\$ 1 billion, India spends insignificant amounts on activities that can be treated as fisheries management. While Norway spent about 8 per cent of the total gross revenue of marine fish landings, Iceland, 3 per cent and Newfoundland, 20 per cent in 1999, Thailand had spent only 1.64 per cent, although its fishery is beset with overcapacity and overfishing problems. However, the Thai figure for 1991 was only 0.70 per cent. Such investments, which are essentially long-term in nature, should be seen as an investment in the future of the fishing industry and in building up the image of its products in the world market.

Pressure from Environmental Groups Wins Over Affluent Consumers

Without effective conservation and management measures, it may be difficult to gain consumer acceptance in the US and European markets in future, since environmental groups have begun to successfully persuade consumers to take responsibility for the fish they consume. As resources come under increasing pressure from market forces and poor management, and with consumers wanting to have a greater say in how fish should be produced, the market for ecolabelled fish in future is bound to expand from its current sliver. Those countries in the forefront with better conservation and management regimes are bound to benefit from better marketing opportunities. Consumers of fish and fish products in rich countries are likely to express a greater desire to consume fish that are produced under better conservation and management regimes. The origin of ecolabelling schemes like the Marine Stewardship Council, for example, is based on such expectations.

The Marine Stewardship Council is a Controversial Initiative

The market does not distinguish an ecologically sustainable scale of matter-energy throughput from an unsustainable scale, just as it does not distinguish between ethically just and unjust distributions of income. Sustainability, like justice, is a value not achievable by purely individualistic market processes.

-Herman Daly

The Marine Stewardship Council (MSC), launched in early 1996, was set up mainly to design and implement market-driven incentives for sustainable fisheries, which translates into responsible, environmentally appropriate, socially beneficial and economically viable fisheries practices that maintain the biodiversity, productivity and ecological processes of the marine environment. The Principles and Criteria (P&C) developed through an international consultation process set the standard. The P&C described indicators against which a fishery was to be compared, to enable it to make a claim that the fish it sells to processors, retailers and consumers

alike originated from a sustainable and well-managed source.

The multi-stage process of certification is set into motion at the request of a fishery. The onus is on the fishery to formally agree to comply with the MSC certification and to choose an MSC-accredited certifier after undergoing a Gap Analysis— geographic approach to the protection of biological diversity using Geographic Information System (GIS) technology—a proactive approach to protecting biodiversity, developed in the United States in the late 1980s for the terrestrial environment, and extended to the aquatic environment in the mid-1990s. Depending on the report of a pre-assessment visit from the certifier, the fishery would decide whether or not to proceed with certification. If the report were acceptable, the certifier would undertake a full assessment of the fishery to the MSC standard and decide whether or not to award the certification. The whole process could take about two years, if we take the example of the fisheries that are already certified.

Although the scope of MSC was marine fisheries activities up to, but not beyond, the point at which the fish is landed, the need to confirm to the consumer that fish from certified sources could be traced and held separate from the stage of production to the final retailer, requires that these certifying firms have also to do a 'chain-of-custody' audit. Products from certified fisheries are to be marked with an on-pack, "*Fish Forever*", logo to inform consumers that they come from sustainable, well-managed sources.

The MSC accreditation scheme was subsequently established in mid-1998 and the first seafood products certified by the MSC were launched in early March 2000. The first MSC-certified products were from the UK –Thames-Blackwater fishery for herring, employing drift-nets and with an annual production of 150 tonnes – and from Australia – the US\$ 200 million fishery for rock lobsters, caught in waters up to 60 km. depth using pots/traps. The combined employment in production, processing and marketing generated by both these fisheries would not cross a couple of thousands. The Alaskan salmon fishery (using trolls and nets) is the third one that has obtained MSC certification.

Very much on the agenda of the MSC is the promotion of exports of fish from well-managed fisheries in developing countries and assistance to ensure that such fisheries are responsibly managed. Several fisheries from developing countries have expressed an interest in MSC certification. They include: the Galapagos lobster and mixed fishery of Ecuador; the Ceara lobster fishery of Brazil; the artisanal hake fishery of Chile; the PhaNga mixed fishery of Thailand; and the Sulu Sea blue crab fishery of the Philippines. The Ecuadorian Government has publicly endorsed MSC. Sainsbury's Supermarkets Ltd., which has an annual turnover of over US\$300 million in fish and fish products alone, is now working with the suppliers of tuna in the Maldives with a view to achieving MSC certification. Sainsbury's already sells MSC-certified Thames herring and rock lobster.

Several concerns about the implications of the MSC certification process for the artisanal and small-scale fisheries in developing countries have been expressed and some of them were discussed in *Fish Stakes* (ICSF 1998). The main concern of ICSF is about "the practicability of a private accreditation programme such as the MSC, claiming to promote sustainable fishing, based on universal standards that are developed without due consultation with fishworker organizations, and that do not take into consideration the diversity of fisheries in the developing

countries". Other concerns include: the issue of market access; the autonomy of fishers in the small-scale artisanal sector; the certification and chain of custody costs; and in cases where the MSC standards are practicable, the costs associated with adjusting fisheries to make them comply with these standards.

The MSC Process Has Ignored the Role and Opinion of Artisanal Fishworkers

Although the P&C claim to be a product of an 18-month worldwide consultation process, there was no consultation whatsoever in regions with the largest number of fishworkers and with the largest production of food fish in the world. There were none, for instance, in important fish producing and exporting countries such as China, India, Indonesia, the Philippines and Senegal. In all the consultations organized by MSC, the participation of fishworkers, without exception, was poor. Moreover, the list of signatories and supporters of MSC mainly includes wholesalers, retailers, environmental groups and consultancy companies; there are no fishworker organizations from any developing country.

Unilever has already made it known publicly that only fish carrying MSC logo will be sold through its outlets by the year 2005. According to the MSC Fisheries Certification Process, although it is the fishery that contacts the MSC for certification and not vice versa, the autonomy could still be threatened if wholesalers and retailers in the markets of developed countries insist on an MSC logo.

MSC May Well Become a Non-tariff Trade Barrier to Fish Exports from the South

Very few developing countries have worthwhile fisheries management programmes. Even if a developing country fishery would like to seek MSC certification, it would, therefore, be almost impossible to show, as required by the P&C, that the fishery under consideration is subject to an effective management system. Thus, the way the MSC is designed, it could cause problems of access to the markets for ecolabelled fish in Europe and the US—the largest markets for fish and fish products, after Japan—for the fishery products originating from most developing countries. Products from fisheries such as the hake fisheries of Namibia or the tuna fisheries of Maldives, however, could benefit since these come under an effective management system. But these are exceptions.

Even if the fisheries of developing countries are potentially certifiable, they could be unable to defend a claim that they maintain the integrity of the ecosystem, if they lack the financial resources to undertake the necessary study and documentation to establish this claim. The current certification process appears to be elaborate and expensive. Increasing costs and problems with market access could also arise from the requirements for 'chain-of-custody' audit. The P&C visualize the MSC certification programme also working in conjunction with other complementary certification programmes such as the ISO 14000, which will further enhance the costs. These programmes are expected to evaluate, for instance, the environmental and food safety standards of post-harvest facilities that handle fish originating from the MSC-certified fisheries. The costs considerations are further worsened because there is no clear signal from the market as yet that the price for ecolabelled fish could more than offset the costs of certification.

Are Seafood Companies and Traders Really Concerned About Sustainable Fishing?

It is moot whether the seafood firms that have endorsed the MSC are, in fact, concerned about sustainable fishing. They seem to be interested in the MSC logo mainly to improve their own market access and public image. Speaking at the Asian International Seafood Show, Hong Kong, in May 1999, David Carter, General Manager of Kailis and France Group, Australia, which has strong interests in the rock lobster fishery, gave three reasons for supporting the MSC initiative. These were: (1) a reduction in tariffs on Australian products entering the EU; (2) the potential to increase market share; and (3) an opportunity to improve the general public's perception about the fishing industry. He further said the fishing industry had only two choices: "to embrace and be the engineers of change or to be squashed like a bug on the windshield of rising public concern" (see *Advisory Board Newsletter* Volume 1, Issue 1, May 1999, published by the MSC). Firms such as Unilever and Sainsbury's also have interests in other businesses. Associating with high-profile environment campaigns could certainly provide a better image for marketing highly profitable, non-fishery, not-so-green products.

Artisanal Fishers May Well Suffer for Fishing Responsibly!

Lastly, many artisanal fishers would not be in a position to benefit from an MSC certification programme since, in most instances, using responsible fishing methods, they often compete for the same resource with large-scale fishing units that use non-selective and environmentally destructive fishing methods and practices. Since, under the MSC scheme, the unit of certification is a fishery in its entirety, there is no scope to reward the responsible fishing methods of the artisanal sector, and to reprimand the destructive fishing activity of the large-scale sector, if both co-exist in the same fishery. In such fisheries, unless there is co-operation between the artisanal and the large-scale fisheries, there is no way of obtaining MSC certification. In this sense, several of the artisanal fisheries that have expressed interest in MSC could very well be proved wrong in assuming that they could benefit from the MSC scheme, unless they are the exclusive harvesters of the resources or can strike an agreement with their large-scale competitors.

The Future of Ecolabels and "Fair Trade" in Fish is Hazy

It is still unclear, or too early to say, how the market will respond to either ecolabelled or "fairly traded" fish, although it is very likely that the market will accept them in the future. In the light of growing interest in linking environment and labour standards to international trade, we could view these developments as either an opportunity or a bottleneck. Environmental and labour standards could complement the standards for food safety, which are strictly adhered to in the US, EU and Japan. (In fact, the greatest denial of market access for fish and fish products from developing countries occurs under the mantle of food safety norms.)

Environment and labour standards and those for food safety could complete the triangle of external concerns about fish production and consumption. One can actually conceive of a situation where a fish product imported from a developing country and sold in an EU supermarket, for instance, may carry three logos—one for food safety, one for its origin from a sustainable fishery, and one for being exported by an association of fishworkers that complies with the core human rights conventions of the ILO!

But fisheries in developing countries could still benefit from these developments. Fishers using

environmentally selective fishing methods and practices and those belonging to genuine fishworker co-operatives or associations could hope to benefit. While making all efforts to profit from such developments, fishworker organizations and national governments should exercise sufficient caution to prevent such standards from acting as an external barrier to trade. National or provincial fisheries authorities, together with fishworker organizations and the scientific community, could develop sustainability criteria and a management mechanism that are realistic and practical. These should then be effectively implemented.

Well-managed and well-organized fisheries are becoming important marketing opportunities in international trade. Governments, fishworker organizations and other concerned groups should proactively interact in these developments. Unlike many of the other exports from developing countries, fish is not a commodity easily substitutable with fish from the waters of developed countries. This realization, coupled with a proactive engagement with the concerns of consumers, could very well promise a better future for both fish and fishworkers.

Food Safety May Be Injurious to the Economic Health of Artisanal Fishers

From the point of view of market access, more than environment-related issues, the biggest challenge faced by developing countries, especially in the US and European markets, is mainly on account of food safety. A recent estimate of the Centers for Disease Control and Prevention (CDC) of the United States claims that 76 million cases of gastrointestinal illnesses in the United States in 1999 are food-borne, which resulted in 5,000 deaths. Since the early 1980s, 'a food safety paradox' has been observed—a significant increase in the number of diseases linked to food in developed countries, in spite of a significant share of food being produced under stringent hygienic conditions. Although end product sampling was increased to tackle this problem, it was not successful—and considered inadequate—in reversing this phenomenon. The Hazard Analysis and Critical Control Point (HACCP) system was introduced in this context to "address all the relevant hazards in food production" at the level of production, processing and distribution. It had also proved its efficiency in controlling the hazard posed by a common toxinogenic bacterium, in low-acid canned foods. In the HACCP system, each substance, microorganism or condition of food that can cause disease is called a "hazard".

The WTO Agreement on the Application of Sanitary and Phytosanitary Measures

According to the FAO, fish "can be contaminated from the moment of capture until it is eaten. Contamination may occur because pathogenic micro-organisms form part of the normal flora of the fish. In other cases, toxic substances are introduced through cross-contamination, recontamination or faulty handling and processing". Canada, the European Union, and the United States introduced regulations based on HACCP system in the 1990s. In 1997, the HACCP system was incorporated into the WHO/FAO Codex Alimentarius and thus HACCP system became the basic reference for international trade disputes under the WTO Agreement on the Application of Sanitary and Phytosanitary Measures.

Many countries have set up processing and inspection methodologies that satisfy HACCP requirements over the last decade. In mid-1999, there were 50 countries complying with the European Commission's HACCP-based regulations. Of these, 37 were developing countries. But, as FAO points out, "not all developing countries were able to make the necessary initial

investments. Sometimes credit for this purpose was scarce or non-existent and, as a result, some countries suffered a drastic reduction in the number of establishments authorized to export to EU markets. Cape Verde and Guinea-Bissau became extreme examples of this in mid-2000 when the EC banned all imports of fish from these countries.”

Although HACCP system is believed to be an improvement on traditional fish inspection and its application is expected to lead to a reduction in food-borne diseases, so far there is no documentary evidence to prove this point. In a 1999 CDC study quoted by FAO, it is stated that there is no indication of food-borne diseases “getting better or worse” as a result of following HACCP-based regulations.

HACCP is Seen As Another Non-tariff Barrier Imposed by the Developed World

Only a few developing countries have made HACCP system obligatory in their domestic markets. It has been mainly seen as a non-tariff barrier to trade put up by developed countries. Developing countries comply with it only to the extent they can export their products to the developed country markets. However, as FAO points out, “developing countries that extend the HACCP system to their internal market should expect to reap public health benefits”, because to apply HACCP, it is necessary to ensure basic hygiene for all of the activities related to fish production. In several countries in Asia, Africa and Latin America that suffer from water-borne and food-borne diseases, applying a HACCP system can contribute to improve the quality of life of the poor.

A compartmentalized approach to standards—higher standards for the export market and lower ones for the domestic one— although sometimes sensible in the short run, can be counterproductive in the long run, since it will be difficult to maintain such distinctions in a convincing manner. Developing countries should wholeheartedly build up standards and implement measures that can contribute to improve the status of exploited fish stocks as well as the quality of life of fishworkers and consumers. Upgrading national standards to levels that are compatible with international ones, which they themselves are party to in their development, can certainly put developing countries in a better position to isolate protectionist tendencies in seafood export markets

Only an Ecosystem-based Approach to Fisheries Management Will Work

Sustainable development is the management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. Such development conserves land, water, plant and genetic resources, is environmentally non-degrading, technologically appropriate, economically viable and socially acceptable.

--Food and Agriculture Organization of the United Nations

Unlike the single-species model in fisheries management, which is by far the most prominent model in most parts of the world, an ecosystem-based approach to fishery management could be an effective tool in developing countries since it may take into account the complexity of the marine and coastal ecosystems, an attribute already factored in a limited way into the decision-

making processes of several traditional, small-scale fishing communities. A multitude of species, however, could complicate adopting such an approach to fisheries in the tropical belt.

According to the FAO FishBase, in India, for example, about 263 out of the 1,000 marine and brackish water fishes, identified so far, are commercially significant, as against just 25 out of 250 in Norway, and 21 out of 300 in Iceland. In Indonesia and the Philippines, countries with the greatest marine biodiversity in the world, the figures are 681 out of 2,511 and 616 out of 2,255, respectively. Each of these fish will have several stocks and the total number of stocks could run into thousands. Very little is known about the impact of fishing on these stocks.

There Are Many Challenges to Managing Small-scale Fisheries in Developing Countries

The main challenge in applying an ecosystem approach to small-scale fisheries management is in negotiating the adverse impacts on the ecosystem arising from factors outside the control of the small-scale sub-sector. If we are talking about applying such an approach to small-scale fisheries, then we are confined to discussing input and output control measures, and institutional arrangements to regulate access to fishing grounds especially when they are overcrowded or are in a state of ecological stress. In multi-species, multi-gear and multi-cultural fisheries, especially in the small-scale sub-sector, what indeed would be the best locus of measures to manage fisheries would be a moot point. Quota management regimes are ruled out because, by using such measures, it would be impossible to manage with any reasonable degree of success the "mosquito" fleet operating from a multitude of landing centres in many developing countries. Moreover, the associated problems of such regimes, particularly high-grading and concentration of ownership in the hands of a few, would only exacerbate social problems in labour-surplus, small-scale fisheries.

While discussing the need for fisheries management in small-scale fisheries, especially effort control and limited-entry measures, the role of conventional management measures is limited by poor institutional arrangements. The problem is further complicated by numerous landing centres, and too many fishing vessels as well as people in the fisheries. It would, therefore, be difficult, if not impossible, for governments to successfully regulate marine fishing activities, especially to introduce limited-entry regimes in small-scale fisheries without the active participation of fishing gear groups or fishworker organizations. There is, however, a lacuna of such organizations in many developing countries.

The State May Have to Focus More on Human Dimensions

Although, in industrialized countries, fisheries management programmes can directly focus on fishing capacity, fisheries resources and fish habitat-related issues, such an approach may be difficult in developing countries where the State, as a priority, may have to focus on the human dimension in the fisheries sector, especially the need for poverty alleviation and food security in coastal areas. The short-term goals of small-scale fisheries management under the aegis of the State cannot be exclusionary in nature, given the widespread poverty and unemployment in rural societies in many developing countries. A State that cannot provide alternative employment to fishers may also not find it easy to ask people to leave the fishery to alleviate overcrowding in fishing grounds. However, such exclusionary regimes can be designed and implemented by the small-scale fishing industry itself and legitimized by the State machinery.

We are yet to see effective fisheries management programmes in any labour-surplus, small-scale fisheries in developing countries that are successfully implemented by the State. Even in large-scale fisheries, for that matter, there is hardly any success story of fisheries management, especially from developing countries. Despite their large-scale fisheries, important fish-producing countries like China, Thailand, India and Indonesia still do not figure as countries with effective management programmes. Given the collapse of fisheries even in countries like Canada—which was believed to have an effective fisheries management system until the collapse of the Canadian Atlantic cod fisheries in the 1990s—the lack of political will, or confidence in the feasibility of fisheries management programmes, is understandable in many developing countries.

There is no straightforward, universal solution to many of the vexing problems of overfishing and overcapacity in small-scale fisheries, however, and this calls for a better understanding of the structure of fisheries, the motives of, and compulsions on fishers, and the interaction between various components of fisheries, especially between the large- and small-scale, and between different gear groups within the small-scale sub-sector.

Given all the failures—and indifference—of the past, new fisheries management initiatives should be based on a process of dialogue with the small-scale fishing industry, to arrive at long-term and short-term goals for management, taking into account social, economic, ecological, and other relevant aspects of labour-surplus fisheries in developing countries. Such initiatives can be taken by the State. One way to create room for such a dialogue would be to progressively redistribute fishing space to the small-scale fisheries sub-sector by phasing out large-scale, non-selective fishing units. Such a measure would also consolidate the recognition granted to small-scale fisheries by several governments since the 1990s and by the 1995 FAO Code of Conduct for Responsible Fisheries.

Simultaneously, there should be a serious effort initiated by the State in the long run for greater institution building—building up fishworker organizations, for example—that will help devolve principal fisheries management functions to the representative small-scale fishing industry organizations. A devolutionary process should aim at delegating authority—not just decentralization—based on the subsidiarity principle, meaning, implementing management functions at the most effective level, starting from the bottom. In large countries like China, Brazil, India and Indonesia, where it is almost impossible to have a centralized—or a provincial level—effective fisheries management programme, such an approach seems to suggest better sense. These institutions, however, should be designed in such a manner that they become true representative bodies, that they do not become hegemonic or inequitable, or end up just as mere conduits for State patronage.

There is Need to Build On Community-based Fisheries Management

In developing countries, there is a greater need to look into the best institutional structures that are ideal for undertaking fisheries management functions. Some lessons may be drawn from traditional community-based fisheries management initiatives involving fishing communities, especially to regulate access to fisheries and to limit fishing capacity. These tend to be more localized initiatives among homogenous gear groups, and often have a conflicting relationship

with other gear types. They are forms of rights-based fisheries, often based on rotational access to fisheries resources, but their effectiveness is more confined to stationary or beach-based gear or to sedentary species, than to mobile gear or species.

There are already several examples of such traditional arrangements in developing countries. The most salient aspect of these arrangements is that they have clearly defined rules of exclusion based on allegiance to a caste, community or a group. These arrangements, however, most often emphasize aspects of allocation, and are mainly designed to mitigate conflicts within their membership over access to marine fishing space—to preserve “the social order, not the balance of nature”, as Cordell puts it. The fishing capacity of the members, however, could exceed the regenerative capacity of the resource and can contribute to overfishing pressures, especially in the context of new technical changes in fisheries.

In Pulicat Lake, India, for example, there is the *padu* system, a system of rotational access to shrimp fishing grounds, but it does not mitigate pressure on shrimp resources because different groups of members, in a rotational fashion, are incessantly harvesting the resources. Similarly, in several estuarine fisheries in Asia, although several stake net groups practice rotational access, the mesh size is below the legal limit and it often contributes to overfishing of juveniles of diadromous species. We also notice that traditional arrangements to regulate access are challenged under conditions of greater market demand, when non-member gear groups in coastal fishing villages refuse to recognize the legitimacy of these arrangements, and often do so with the support of the government.

The issue of legitimacy is further exacerbated by the conflicts between exclusionary traditional arrangements and the non-exclusionary formal arrangements under the auspices of the State. This can be effectively tackled if the governments throw their weight behind traditional systems. In exchange for lending formal recognition, the governments can insist that these arrangements should adopt and implement effective conservation measures.

A “Crossword” Approach May Work In Small-scale Fisheries Management

Conservation of fisheries resources, protection of fish habitats, and allocation to fishers are the three most important considerations in fisheries management. The vantage point to start from is the gear group because, without its cooperation, it would not be possible to adopt effective conservation measures and to protect fish habitats from fishery-related stress. It is thus the principal link in fisheries management, especially in small-scale fisheries in developing countries.

Initiating fisheries management measures in small-scale fisheries in developing countries could be through a “crossword” approach, i.e., filling up management niches that are relatively easy at first, and then moving on to more difficult ones with the aid of early breakthroughs or solutions.

Stationary and beach-based gear groups, gear groups fishing around artificial reefs, and gear groups targeting sedentary stocks are arguably better candidates to collaborate in a fisheries management programme. The most difficult ones could be the migrant gear groups, who may have a vested interest in maintaining an open-access regime, like the long-line fishers of Senegal.

Formal and traditional fisheries arrangements need to combine, to give rise to effective fisheries management policies and programmes. Simultaneously, measures should be drawn up to regulate large-scale fishing operations, including a proscription of fishing gear and fishing operations that are destructive or socially inappropriate.

International Cooperation Is Needed to Manage Small-scale Fisheries

As a global solution to the national, provincial, or local problems of overfishing and overcapacity, there are three possibilities that should be considered. First, the industrialized countries should not transfer their excess fishing capacity to developing countries even as an article of aid. What is in fact required is weeding out of the excess capacity problem—Northern countries should not be building up excess capacity in the first place. Subsidies are still extended for fleet expansion, for example, in several EC countries and this practice should be strongly discouraged.

Second, for small-scale fisheries that are overcrowded as a result of demographic pressure in developing countries, industrialized nations may contribute to alleviating such pressure by facilitating temporary migration of surplus labour into their domestic or distant-water fisheries, particularly into fisheries that are characterized by labour shortage. The substitution of labour with capital in many developed country fisheries, *inter alia*, is believed to be a function of growing labour shortage. The average age of a Japanese and Korean fisherman, for example, is over 60 and that of a Canadian fisherman in the Maritimes is around 47.

Instead of substituting labour with capital, fisheries at low levels of technical intensity can be maintained, even in the event of chronic labour shortage in the North, if well-trained migrant workers from developing countries are recruited. Threats to immigration can be addressed by carefully designing time slots for transient accommodation of labour. Already several OECD countries are employing migrant fishworkers from developing countries in their fisheries because of labour shortage. This is especially noticeable in Spain, France and Italy. There are several examples of employment arrangements between the North and the South, especially in relation to the employment of computer and medical professionals from countries like India in the US and Europe. Needless to say, this will not be a solution to the problems arising from demographic pressure, but it would certainly be seen as a positive gesture from the North to the South.

Third, for the management of overexploited fisheries in developing countries there is need to set up a well-designed, time-bound, international fisheries management assistance fund in exchange for a commitment to manage fisheries in a consultative and transparent manner, within the framework of an ecosystem approach. However, the governments in developing countries should also consider investing in fisheries management from existing revenue sources. Although net earnings from fisheries exports for many developing countries are quite high, little significant investments are made in conservation and management by most developing countries. With a gross value of fisheries output at US\$ 5 billion in 1997-98 (at ex-vessel prices) and an export earning of over US\$ 1 billion, India, for example, spends insignificant amounts on activities that can be treated as fisheries management. In 1999, when Norway spent about 8 per cent of the total gross revenue of marine fish landings on fisheries management, Iceland 3 per cent and Newfoundland 20 per cent, Thailand had spent only 1.64 per cent, although its fisheries have been beset with overcapacity and overfishing problems for some time. The mindset is yet to

change from considering fisheries as an extractive industry, to an industry based on renewable natural resources.

An Ecosystem-based Approach is a Holistic One

An ecosystem-based approach is a holistic approach within a broader time frame. Such an approach to fisheries conservation, management and development can make it possible to look at all aspects of fisheries, including land- and sea-based, as well as known and unknown factors. It can enable the sub-sector to address issues of immediate and long-term concern, especially to prevent the impact of destructive fishing practices on fish stocks and fish habitats, to prevent the impact of land-based sources of pollution and coastal degradation, to rebuild depleted fish stocks and to restore marine habitats. It can facilitate building up, and strengthening, traditional knowledge systems in artisanal and small-scale fishing communities.

An ecosystem approach is of greatest significance to small-scale fisheries because it can broaden the scope of fisheries management. It can help bring about a greater control over destructive fishing operations that employ non-selective fishing gear like bottom trawling, especially in minimizing the cascade effect of such fishing operations on fish stocks, fish habitats and on the livelihood of fishing communities. Such controls could even include a phasing out of destructive forms of fishing operations. A potential strategy for governments could be to first phase out destructive forms of large-scale, industrial fishing operations, in exchange for a commitment from small-scale fishers to stop destructive fishing operations such as dynamite and cyanide fishing, and the use of fine-meshed nets.

There is need to broaden the artisanal/small-scale knowledge-base to encompass ecological parameters hitherto not sufficiently understood or not taken into account, e.g., the greater impact of natural factors, the broader picture of prey-predator relationship, the larger role of fish habitats, and factors that contribute to unprecedented habitat degradation like pollution. There should, however, be a sense of "historical continuity", in an ecosystem-based approach, an attempt to build up on what already exists, especially to transmute the past traditions with new scientific insights to meaningfully address the needs of the present, or the contemporary systems of marine resource use.

Further, the development and application of an ecosystem-based approach to fisheries management in many developing countries should be made meaningful by building up strong fishworker organizations and by devolving management functions to them. This would help to address the problem of 'limited reach' of the State machinery to remote fishing centres in many coastal States.

Developing the building blocks of an ecosystem-based approach with social sensitivity is complex, difficult and expensive and require a "global partnership for sustainable development", as quoted in the epigraph of this paper. It should be based on a crossword approach, which implies a realistic time frame to implement various components of an ecosystem-based fisheries management programme in a progressive manner, i.e., using available knowledge to solve bits of the puzzle, while simultaneously expanding the knowledge-base to fully address the locus of problems at the macro level.

Women Maintain the Social, Cultural and Economic Fabric of the Fishing Community

Women of fishing communities play vital roles both within the fishery and the community, nature of the work of women differs by country, culture and region and between rural and urban areas. Women, whether of the North or South, can be seen playing the following kinds of roles:

As workers within the fisheries (paid and unpaid):

Women may work in fish marketing, in the preparation of bait, making and repairing nets, collecting crabs and shellfish, gathering and cultivating seaweed and algae, in smoking, salting and drying fish, and, though in rare cases, actual fishing.

Unfortunately, women's role in fisheries is often ignored or brushed aside as mere "liaison work" that many wives of fishermen undertake. In several areas, women take on work on behalf of their fishermen husbands, such as dealing with financial institutions for credit for fisheries operations and for repayment, dealing with the governmental fisheries agencies, and so on. These roles are rarely recognized, let alone paid for.

As workers in processing plants:

Women are very active in the seafood processing sector, as part-time or full-time workers in processing plants.

As workers within the family and community:

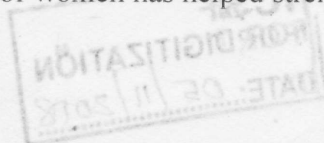
Women, as everywhere else, are almost entirely responsible for the care and nurture of the family. Where the men stay away fishing for long periods, women run the household in the absence of their husbands. They are important actors in the fishing community and are crucial in maintaining social networks and the culture of the community.

As workers outside the fisheries:

Often, women of coastal fishing communities take on activities outside the fishery, that give them some form of stable monetary income, since the income from the fishery is inherently unstable and unpredictable. Women may start some work that generates income, such as running a small shop or a restaurant, either individually, or as part of groups.

As members of fishworker movements:

Where women have organized, they have been active in political struggles, as for example, against Individual Transferable Quotas (ITQs) in Chile, against indiscriminate tourism development in Senegal, against joint venture arrangements in India, etc. As part of a local church group, women of the coastal community of Redondo, in Ceara, Brazil, were active in initiating and supporting the movement against predatory fishing of lobster resources. The issue of the destructive impact of trawling in the State of Kerala, India, has frequently been raised by women fish vendors too, since they have been directly affected by the falling market prices as a result of large trawler catches. The fishermen's wives' organizations in France, under the banner of FIFEL, are actively participating in the events leading up to the review of the Common Fisheries Policy (CFP) in 2002. They are lobbying against privatization of the rights to the fishery, and are demanding a role for fishermen and their wives in elaborating fisheries policy. In all these cases, the participation of women has helped strengthen the movements and broaden their agenda.



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