

The artisanal and small-scale sector contributes up to 25 per cent of the world marine fish production, and almost the entire catch is taken from the coastal waters. The health of the coastal marine environment therefore is inextricably linked to the livelihood of over 100 million people who are directly or indirectly dependent on this sector. Two-thirds of marine fish production come from stocks which pass the first and most vulnerable stages of their life-cycle in coastal areas. In addition to overfishing (from non-selective gears like trawling and other destructive fishing methods) and aquaculture practices, coastal environment is also threatened by pollution, siltation, construction, excavation, and mangrove deforestation.

Excessive fishing effort and destructive fishing methods can lead to a fall in catch per unit effort, and in total fish production. The indiscriminate use of trawlers can devastate fish stocks. Use of explosives as a fishing method, especially in islands in the tropical belt where fishermen combine different forms of food gathering, not only destroys large tracts of coral reefs, but also results in indiscriminate killing of all kinds of marine life. Similarly, the use of cyanide to drug ornamental fish kills the coral reefs and other fish habitats.

Many modern, intensive aquaculture practices have a debilitating impact on the coastal environment and the inshore fisheries. The contamination of coastal waters from aquaculture wastes can cause various problems for coastal capture fisheries (similar to sewage and industrial pollution). Removal of larval and gravid female prawns and the incidental destruction of fish larvae negatively affect the recruitment pattern of fish into inshore stocks. Bacterial



Background Note

Coastal Environment and Fishworkers

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Background Note

Coastal Environment and Fishworkers

and viral diseases that break out in intensive culture tracts kill species in the wild. Also, the practice of feeding fish to fish (on which intensive aquaculture depends) is highly wasteful since only about 30 per cent of such protein is converted into new fish protein. From a social perspective, the quantum of fish reduced to meal all over the world mainly to cater to the agriculture industry could substantially improve the food security of many poor countries.

Additionally, the problem of biomass fishing the phenomenon of intensive harvest of planktonic material and trash fish as feed for shrimp in the aquaculture sector affects the recruitment to the coastal fisheries.

The main causes of coastal pollution include sewage and industrial wastes, residues of pesticides, herbicides and organic fertilisers as well as feed and prophylactic matter from agriculture and aquaculture. Siltation occurs from discharge of mud into the coastal waters as a result of deforestation and excavation of sand and coral reefs. Turbidity of the waters from suspended silt dwindles fish catch. Destruction of mangroves and coral reefs destroys fish habitats and exposes vulnerable coastal communities to the fury of cyclones.

Increasing competition for coastal tracts from activities such as tourism, aquaculture, agriculture, military use, human settlements, and industrial establishments threatens easy access to the fishing ground from land, especially in countries without harbour facilities. There are instances of fishermen getting evicted or relocated from their traditional bases as a result of competition from these activities. Forced relocation of fishermen from villages with high

demographic pressure also has dislocated subsistence fishing economies in some countries.

Environmental degradation of land also can add to the conflicts in the coastal waters. In countries with drought-prone areas, for example, the coastal fisheries provide seasonal employment to peasants and agricultural labourers. When droughts persist and land becomes uncultivable, those who come to the fishery continue to stay, and it adds to the pressure on coastal fisheries.

Being at the tail end of many land-based sources of pollution and habitat destruction, the impact of coastal mismanagement are naturally most pronounced in the fisheries. Since majority of the poor fishermen in the developing countries in particular do not have recourse to an alternative livelihood, the degradation of coastal waters should be of utmost concern.

In spite of greater attention being paid to environmental degradation, specific information on habitat degradation is fragmented and anecdotal in fisheries. The fishworkers' organisations could demand a systematic compilation of baseline information on marine habitat destruction. They can take the initiative to put pressure on the state to form decision-making bodies with a multi-sectoral approach, and with representation from all user groups. This should be with the important objective of minimising the adverse impact on coastal habitats of industrial activities, by attempting to tackle these problems at the source itself. Unless there is greater interaction between user groups, also with the active participation of the state, it may be difficult to arrive at permanent solutions. For effective participa-

Background Note

Coastal Environment and Fishworkers

Background Note

Coastal Environment and Fishworkers

tion, fishworkers' organisations should enjoy a legally formalised right to participate in these bodies and to advise them on matters of concern.

Wherever appropriate, national, regional or international institutions should be set up with the participation of fishworkers.

Even if community-based fishery management is introduced in coastal waters, it could be made redundant if the negative impact of non-fishery activities on the coastal waters is not controlled.

Integrated coastal zone management, therefore, becomes a requisite for the successful implementation of communitybased fisheries management.

However, the coexistence of various kinds of property regimes (private ownership, state ownership, community-controlled, etc.) and the varying degrees of priority attached to coastal zone management by different user-groups could make this concept a difficult proposition to implement.

Consent as well as coercion (through legislation) are important preconditions for its success and therefore fishworkers' organisations may have to lobby respective governments for adequate legislation.

For this, it may also be important to be represented in appropriate decision-making bodies.

Issues for Consideration

- What are the various kinds of land- and sea-based activities that contribute to environmental degradation in your fishing grounds?
- Do you agree with the concept of community-based coastal zone management to achieve sustainable fisheries as a solution to marine habitat degradation? How would you react to problems specific to this concept and what would be your suggestions to overcome them?
- Since fishworkers are the most direct victims of degraded marine habitats, could fishworkers' organisations take the initiative to begin a dialogue with other user-groups?
- What support do you expect to undertake documentation of environmental deterioration, to initiate dialogue with conflicting user-groups and to undertake integrated coastal zone management?

Background Note

Coastal Environment and Fishworkers



Organisations are to be seen as an institutional requirement in fisheries, either to systematize the question of access to the fishing ground, to mobilise inputs into fisheries, or to coordinate the disposal of catch. At the social level, there are several traditional structures that try to ensure equitable access to the fishing ground within the confines of a particular community. These are arguably the oldest forms of community organisations in fisheries. They are informal and localised and in addition to overseeing distribution of access to the fishing ground they also mediate in intra- and inter-community conflicts.

Background Note

Fisheries and Fishworkers' Organizations

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At the economic level, are the fisheries cooperatives that are principally involved in the organisation of production and/or marketing of fish and fish products. They may also negotiate on behalf of fishworkers with the government for subsidies on various inputs into fisheries and may also negotiate with traders (as well as the government) for better price for their products.

Trade unions are explicitly political and often function in tandem with other organisations in the fisheries sector. Unlike the traditional structures and the cooperatives, the trade unions have a broader agenda, and specifically relate to the labour component of fish production, processing and marketing activities.

They may fight against overefficient technologies that deplete resource base and pose threats for sustainability of artisanal and small-scale fisheries. They may demand exclusive zones for certain types of gear groups and lobby against government policies that are perceived to be against equity considerations.

Legislative intervention and effective implementation of appropriate legislative measures are sought through struggles, to resolve various grievances of fishworkers. Social justice, in terms of fairer distribution of benefits as well as better working conditions and social security measures, is an important tenet of trade unions in fisheries, especially in the developing countries.

There are also instances of formation of associations around specific complaints of fishermen. Once the issues are resolved, these associations are automatically dismantled. There are several instances of such associations being formed both in the developed and the developing countries. These are mostly in protest against the introduction and/or development of highly competitive as well as destructive fishing technologies (like trawling and purse-seining).

Fishworkers' Organizations and Coastal Management

The increasing number of technological innovations and their adaptation into fisheries in response to expanding demand for fish are today putting additional pressure on fishing grounds. Many commercial fisheries are contributing to exacerbation of conflicts over access to fishery resources.

The redistribution of catch in favour of more efficient technologies like bottom trawling, has caused considerable hardship to those fishworkers who are fully dependent on passive fishing gear for their livelihood. Simultaneously, various forms of land- and sea-based pollution and several forms of coastal degradation arising from the development of industry and aquaculture are adversely affecting the fisheries potential, especially in the coastal waters. Various

Background Note

Fisheries and Fishworkers' Organizations

Background Note

Fisheries and Fishworkers' Organizations

management regimes introduced by the state have largely failed to reverse overexploitation, reduce conflicts and limit capacity in marine fisheries.

Until recently, the production limitations of fisheries, with rare exceptions, was not an issue, and this attitude seems to have influenced fishworkers' organisations as well. Except for certain effort control measures at the local level which are basically to minimise conflicts between different gear groups or among fishermen few of the fishworkers' organisations in the past have consciously tried to include conservation practices in their agenda. Recently, however, initiatives are being made by fishworkers' organisations in countries like the Philippines to directly undertake resource management.

Limiting access to the resources through the introduction of use rights is increasingly considered as an effective way of preventing overexploitation of marine resources in the artisanal sector. Individual transferable quotas (ITQs) are also being considered as another effective means of preventing overcapacity and overfishing. The World Bank for example is seriously thinking of introducing ITQs as a conditionality for loans in fisheries. In other words, for better management of various fisheries, attempts are being made to privatize ownership rights in the sea.

The introduction of ITQs, although might contribute greater revenue (to the state), has the grave potential of going against all equity considerations. Not only that there could be concentration of ownership, it may also exclude seasonal fishermen from all fishing activities, for example, in seasons when farming activities are difficult. Its object of meeting

conservation requirements is also doubtful. The estimation of total allowable catch (TAC) of each stock will be next to impossible in the tropical fisheries because of the presence of numerous species. Moreover, the discard rate may be much higher in these fisheries if ITQs are introduced.

Given the inherent difficulties in successfully managing a fishery with conventional resource management measures, appropriate community-based fisheries management (a community in this context means all the fishworkers, their dependents and others living in a specific locality), depending on the characteristics of a particular area /region, and its fisheries has to be seriously looked into.

Traditional community-based fisheries management has been quite successful in minimising conflicts over access to the fishing ground. Although many of the systems have been unable to withstand the inroads of market economy, the traditional knowledge of fish habitats and ecology can meaningfully be combined with appropriate modern management regimes. Communities and the government can work together within the framework of co-management. This will ensure equity as well as conservation and at the same time does not have the negative effects of the open access or the ITQ system. The right to fish within this framework would essentially be the right to enjoy the use and advantages of fish stocks short of their destruction or waste of their substance. This implies custodianship of the fishery resources as well as the environment.

The concept of custodianship, however, raises important questions about the magnitude of fishery operations, the desirable extent of integration into market forces and the

Background Note

Fisheries and Fishworkers' Organizations

Background Note

Fisheries and Fishworkers' Organizations

choice of technology (should one go for more efficient or less efficient technology? Capital-intensive or labour-intensive? Energy-intensive or otherwise?).

As coastal fisheries are prone to coastal degradation, they are also susceptible to the impact of fisheries beyond the coastal waters (which in many countries would mean beyond 3 to 12 nautical miles). This is because of the fluidity of the sea, the migration of fish stocks and the inter-relationship between different species. Successful coastal fisheries management therefore also depends upon minimisation of the adverse impacts of industrial fisheries.

Overefficient technologies could decimate stocks on their migratory routes to the coastal grounds, thus adversely affecting the fisheries potential of coastal fishermen. This again calls for adequate legal measures that will help minimise the negative impacts of industrial fisheries. The coastal fishworkers may have to lobby for this as well.

Although many states seem to be supportive of better fisheries management with the participation of fishworkers, the necessary political will is yet to be generated in several others. Often foreign exchange considerations may force governments to support industrial fisheries to the detriment of the artisanal fishworkers.

It may be in the form of international agreements in fisheries allowing foreign fleet to exploit the local resources against hard currency payments. Or it may be in the form of developing a domestic-based industrial fleet, or by allowing flags of convenience. Fishworkers' organisations, if they are well organised and forceful can put pressure,

nationally and internationally, to revoke such development policies that are harmful to the artisanal fishworkers.

Due to demographic and/or ecological factors, all those who would like to participate in fisheries perhaps cannot be accommodated and therefore fishworkers' organisations should also consider how they could help fishermen to diversify into other sectors.

Compatible with sustainability principles and community-based ownership, among other options, aquaculture as an alternative means of livelihood for redundant labour force should be looked into.

The above discussion shows the need for a complementary framework of social, economic and political functions for a fishworkers' organisation to succeed in its objective for a livelihood, based on equity and sustainability.

Issues for Consideration

- What are the views on the current state of fisheries management especially in your artisanal sector? If community-based fisheries management is acceptable as an alternative to current practices, what are the specific problems that have to be addressed? How could these rights be distributed and what ought to be the rationale for their definition?
- Do you think that the ITQ system is a viable alternative? If you think it is not, what are your alternative proposals?

Background Note

Fisheries and Fishworkers' Organizations

Background Note

Fisheries and Fishworkers' Organizations

- What are your experiences with participatory re-source management? Do you support the idea of co-management, i.e. management of fisheries resources by the community and the state?
- What should be the management regime for industrial fisheries? How will you ensure minimisation of their adverse impacts?
- What are the ways to resolve conflicts between the priorities of the state and those of fishworkers, especially in relation to international agreements in fisheries? Do you think setting up an appropriate body to manage these agreements, also with the participation of fishworkers' representatives, can settle these differences?
- Are there instances of fishermen moving from capture to culture fisheries? To what extent can fishworkers diversify into other activities? What are the alternative livelihood options?

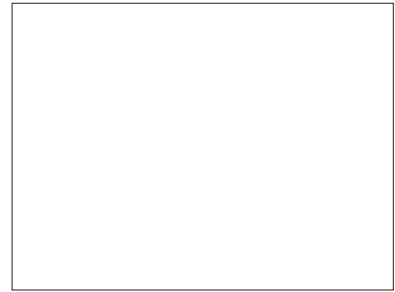


Some 50 per cent of the estimated 30 million fishworkers in the world are engaged in fish capture, and are mostly in the small-scale sector. About 100 million people are economically supported by fishery-related activities. The fishworkers in the artisanal and small-scale sectors are amongst the world's poorest people, and about two-thirds of them are in Asia. China and India have the largest numbers:

Small-scale Sector

The specificities of working conditions and social security vary from sector to sector. In the artisanal and small-scale sector, poor working conditions in fishing would refer specifically to the drudgery of manual labour (in unmotorised fishing) and poor navigational and emergency life-support aids. In an economic and social sense, it refers to bondage of labour to middlemen and payment of wages/shares at levels below subsistence. In the coastal waters, poor working conditions also refer to dispossession of traditional fishing rights, competition from efficient gear-groups like trawlers and purse-seiners that diminish the catch capacity of small-scale gill-net groups. Pollution of coastal waters can also create health problems. Displacement and relocation also sometimes put pressure on fisher-men to expend greater physical energy to reach their fishing grounds.

The social security scene is very dismal in small-scale fisheries in developing countries. There are very few countries that provide more than lip service to old age pension, insurance coverage and accident benefits. Some countries provide nominal amounts as some kind of support to families of fishermen who lost their lives while fishing.



Background Note

Work Conditions and Social Security of Fishworkers

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Background Note

Work Conditions and Social Security of Fishworkers

Although the small-scale sector is a net contributor in the foreign-exchange earnings, hardly any funds are earmarked for their welfare by the state.

Working conditions on medium-sized (over 8m in length) fishing vessels in many developing countries leave a lot to be desired. These vessels have to brave the sea with no navigational, life-support and communication systems. Crew accommodation facilities are very poor.

In developed countries, however, crew accommodation in the newer fishing vessels is much better than in the old ones. But the frequency of accidents of vessels that belong to this category is quite high and is as high as the rate that prevails in coal mines in the UK. Foundering, fire, stranding, capsizing and collision have been documented to be major causes of such accidents.

Industrial Fisheries

In the case of industrial fishing vessels this includes vessels fishing way beyond the coastal waters as well as distant water fishing vessels the working conditions and social security are generally better than what prevails in the small-scale sector in both developing and developed countries. In Chile, industrial fishermen are guaranteed minimum wages and unemployment benefits by law. They also receive compensation for days lost in fishing because of bad weather. In Ecuador, a compulsory social security scheme that provides sickness, accident, unemployment and old-age benefits, and widows and orphans pension exists. However, it is not fully known to what extent these legislation are implemented in developing countries. The general feeling is that they are not implemented properly.

In distant water fisheries, however, especially in the case of Taiwan (which catches over 300,000 tonnes outside its own waters), there are several documented instances of deplorable working conditions on board the industrial fishing vessels.

Taiwan seems to operate the most labour intensive distant water fishing fleet in the world. Most of these vessels are long-liners for tuna. The majority of the workforce on Taiwanese industrial vessels are migrant workers, especially those from the Philippines. Illegal recruitment through unscrupulous agents, contractual violations leading to wage settlement far below what is stipulated in the contract, sexual and physical abuse of workers, long working hours, poor food and unhygienic working conditions and incarceration of workers for disobedience have been documented. There are several instances of desertion from vessels while fuelling the vessel or unloading the catches, as well as cases of mutiny on board leading to bloodshed and death. No social security benefits are provided.

Because of overfishing, the quota allocation system, and higher wages in developed countries, many owners have moved their vessels from the North, particularly from Spain, France and Portugal into the underexploited waters of the Atlantic, Pacific and the Indian Oceans. Under joint ventures, flags of convenience and international agreements, they gain access to the waters of developing countries. In several cases, local labour is recruited at low wages. Although there are a few isolated cases of complaints from countries in Africa, there is very little information on the working conditions and social security on these vessels, particularly of locally recruited workers.

Background Note

Work Conditions and Social Security of Fishworkers

Background Note

Work Conditions and Social Security of Fishworkers

International Task Force on Industrial Fishing Vessels

An international task force, comprising members from the Philippines, Mauritius, Taiwan, Madagascar, Senegal and India, has been formed by International Collective in Support of Fishworkers (ICSF), in 1993. This task force has the following objectives:

- compile legislation and other legal documents on industrial fleet vis-à-vis recruitment, remuneration and conditions of work;
- document working conditions, study the recruitment pattern and suggest campaign and action programmes regarding industrial fishworkers; and
- consolidate interaction and consider new linkages where necessary, with organisations concerned with the rights of fishworkers.

Processing Plants

Over the past twenty years, there has been a major shift of processing facilities, especially for tuna, from the developed to the developing countries. While the 'Cannery Row' in California had been closed down, new tuna processing facilities have sprung up in American Samoa, Solomon Islands (largest employers in these countries are these firms).

Thailand has emerged as the world's largest exporter of canned tuna and its share of the world market has made quantum leap from just 6 per cent in 1982 to 52 per cent in 1991 (in terms of quantity). Consequently, the employment of processing workers, specially that of women, has increased. However, little information is available about the working conditions and social security in these firms. In the

South Pacific, comparison of wages, working conditions, and social security between that of Fiji's with Solomon Islands' shows that the Fiji workers get a better deal than the women processing workers in Solomon Islands.

For various reasons of their own, many processing plants resort to accommodating workers on the factory premises in many developing countries. The living conditions in these plants leave a lot to be desired.

Complaints of these processing workers include:

- inadequate safety conditions on the factory floor and poor remuneration;
- unhealthy working conditions (standing barefoot on cold floor, continuous contact with water without any protection for the hands etc);
- infrequent and short intervals between shifts; excessive workload and longer working hours (in seasons when there is excessive supply of fish);
- insufficient medical benefits (including poor maternity benefits and leave); and
- poor amenities as well as inadequate child care facilities.

Often there is no insurance coverage against accidents. Compensation for loss of limbs is insufficient and there is no old age pension or any family allowance.

Issues for consideration

- What are the safety and working conditions of fishworkers prevailing in the small-scale, medium-scale and the large-scale fisheries sectors in relation

Background Note

Work Conditions and Social Security of Fishworkers

to production, processing and marketing? In what ways can/should they be implemented?

- What are the legislative measures providing for better working conditions and social security? What is the status of their implementation?
- Are there any recruitments of workers into the distant water fishery? Are their rights protected by legislation? What are the kinds of exploitation that prevail on board distant water fishing vessels?
- What kind of safety/social security provisions are available for developed-country fishworkers in industrial, small-scale and artisanal sectors? How far can they provide models for developing country policy-making?
- What are the impacts of environmental degradation on your working conditions?



Background Note

Work Conditions and Social Security of Fishworkers

Development and application of modern technology, coupled with increasing availability and use of fossil fuel energy, have pushed up the extraction rates of fishery resources by almost five-fold over the past forty years: from 18 million tonnes in 1949 to 86 million tonnes in 1989. Application of industrial techniques, capital intensive technologies and economic projections based on short term gain, rather than long term sustainability, has resulted in the introduction of highly efficient fish catching methods, huge expansion of industrial-scale fleets, and the introduction of sophisticated fish-finding and navigational aids. Recent declining trends in extraction rates of many economically important fish stocks (according to FAO, global fish production declined by over 4 million tonnes between 1989 and 1991) has brought attention to the finite nature of fishery resources and the destructive capacity of fishing technology. Historic patterns of investment and support to the fishing industry have built up excessive surpluses of fishing capital with huge operational inefficiencies. Without including the numerous artisanal and small-scale sector fishing vessels, the global fishing fleet comprises over three million fishing vessels, which run an annual operating loss in the order of US\$ 22 billion. It is clearly evident that the current rate of exploitation cannot be sustained - economically or ecologically.

Unless the enormous fishing power (the combination of technology and energy) in world fisheries is reduced, and unless we rationalise the way energy and technology are used to extract fishery resources, there is a danger that stocks will continue to collapse. Millions of fishworkers would be deprived of their only source of livelihood, thereby displacing many thousands of fishing communities. Cer-



Background Note

Technology and Energy Use in Fisheries

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Background Note

Technology and Energy Use in Fisheries

tain combinations of fishing vessel, propulsion methods and fishing gear (Man-made Capital), as well as depleting the resource base, cause the destruction of the very environment which nurtures and sustains the fishery (Nature's Capital). Nature's Capital can only provide a sustainable income if the use of Man-made Capital does not erode or degrade it. However, current global fishery trends show that over investment and misapplication of Man-made Capital are eroding and degrading Nature's Capital.

We therefore need to reflect on ways in which technology and energy can be used to sustain Nature's Capital, to provide us with sufficient income over the longer term. This means formulating fishing policies based on sustainable combinations of the size and type of fishing craft and gear, as well as the means and power of vessel propulsion technology. Initiatives to rationalise and reduce fishing power at all levels in the artisanal, medium-scale and industrial fisheries need to be considered. However, it is particularly important to rationalise the industrial fishing policies of both the developed and the developing countries.

Such fishing technologies as bottom trawling, purse seining, and "wall of death" drift netting, controlled by big business interests have been implicated in the collapse of a number of fisheries, and the destruction of the resource base. The non-specific catch-all nature of these gears results in a large by-catch of undesired species (immature fish below market size, fish of low economic value, marine mammals and sea birds) of between 30 per cent and 80 per cent of the catch. These are dumped in huge quantities, causing unacceptable wastage of precious resources, and environmental degradation.

Human skill and labour can also be substituted and displaced by investment in technology and energy both directly and indirectly. Mechanisation of fishing can greatly enhance labour productivity, but requires significantly increased capital investment, and fossil fuel consumption. The application of mechanical propulsion technology to fishing craft has the potential to take out much of the drudgery and heavy manual work load of fishing but at a cost in fossil fuel use, which must be paid for out of the fish catch (and possibly crew wages). In the same way the use of mechanical gear haulers can be used to replace human labour. Workers on mechanised boats may therefore be relegated to the status of machine operators or coolie labourers. Mechanical propulsion also increases the fishing power and the potential to use more effective active fishing techniques (like purse seining and trawling), which may lead to overfishing, stock depletion and resource degradation. Navigational aids and acoustic fish finding technologies replace traditional skills. Although the use of modern technologies like outboard motors, and computerised navigational aids necessitate the learning of new skills, dependence on technological artefacts increases technological dependence, and fishing economies can become very vulnerable to failures in technology delivery and support systems.

Introduction of larger fishing vessels opens up the possibility for processing and storage at sea, thus by-passing local fish processors and traders. Whilst large scale mechanised (shore based) fish processing plants do open up the possibility for supplying more lucrative markets, generating foreign exchange earnings and providing work places, their capital investment costs are high, they consume large

Background Note

Technology and Energy Use in Fisheries

Background Note

Technology and Energy Use in Fisheries

amounts of energy, and may divert fish catches away from traditional processors and markets (where they already exist). Such processing plants, whilst providing the possibility of processing large quantities of locally caught fish, often rely heavily on the import of other inputs (e.g. cans and other packaging materials, freezing plant, tomato sauce and oil etc.). There is therefore a danger that with investment in larger scale mechanised technology, labour will be displaced, and decentralised community based production, processing and marketing will be replaced by large scale, centralised energy intensive facilities. The various potential benefits and dis-benefits of investment in technology and energy use, particularly the impact on work places and the local economy, need to be discussed, and actions proposed.

The marine ecosystem fixes and channels solar energy into living matter or *biomass*. Important fish habitats such as coral reefs, mangrove swamps, and sea grass beds comprise important biomass resources, supporting a diverse biomass of fish stocks. Biomass represents an important natural reserve of energy, which can be transformed into a variety of products for human consumption (food, oil, fertiliser, and energy) through the application of technology and energy in fishing. The most widely used source of energy for fishing is that stored in fossil fuels (e.g. diesel, petrol, kerosene, etc.). As well as providing fuel for motive power fossil fuels are used for manufacturing plastics (e.g. nylon for nets, resins for fibre glass, etc.), refining steel, and transforming fish into a variety of products. Unlike fish resources, fossil fuel resources are non-renewable. Therefore the way we use and become dependent on the use of fossil fuel energy to extract biomass from the marine eco-

system has implications for the future. Industrial modes of fishing, using active techniques such as trawling and purse-seining are particularly fossil fuel energy intensive. For example, studies have shown that trawl fisheries for cod typically consume 20 kilocalories of fossil fuel energy for every kilocalorie of fish protein produced, and shrimp trawling uses up to 200 kilocalories for every kilocalorie of shrimp protein produced.

As extraction rates of fishery resources decline, increasing importance is being given to the cultivation of fish through aquaculture. However, modern intensive aquaculture is also heavily dependent on non-renewable fossil fuel resources (to produce fish feeds, run pumps, manufacture cages, etc.) and the exclusive use of coastal ecosystems (salt marshes, mangrove forests and swamps, bays and estuaries). Each hectare of mangrove converted to other uses can decrease fish and shrimp harvests by 750 kg. Other environmental impacts include land degradation, pollution through use of pesticides and production of fish farm effluents. Additionally, fossil fuel energy is required to catch and convert live fish biomass into fish meal for formulated aquaculture feeds. Intensive aquaculture would therefore seem to be both resource damaging and environmentally degrading.

Given the abject failure of the various management regimes, both in developed and in developing countries, it is perhaps time to consider globally limiting fishing power. Certain technologies such as trawling and purse-seining, for example, which are inflicting immense environmental damage, perhaps have to be done away with. In the same

Background Note

Technology and Energy Use in Fisheries

Background Note

Technology and Energy Use in Fisheries

way certain aquaculture practices which destroy important natural habitats and consume huge reserves of non-renewable resources for short term economic gain, need to be banned.

Fishworkers in coastal waters have been making a livelihood from fisheries for centuries. The sustainability of these fisheries is also contingent on the craft-gear-propulsion combination that they adopt. Given the large numbers of fishworkers in many developing countries, and also given the fact that these fishworkers do not have any recourse to an alternative livelihood, it is important to ensure that the fisheries on which they depend remain sustainable.

Fishing rights, as far as possible, may need to be given to those who participate in fishing. While considering appropriate technology options, these communities need to understand that certain craft-gear combinations can be labour-displacing in nature and resource degrading.

From this point of view, even if extraction rates in certain fisheries are still below the maximum, it may be worthwhile to maintain a low-efficiency threshold. The factors that govern production and the distribution of various species of fish vary from country to country and from region to region.

Therefore, appropriate combinations have to be developed through consultation among different gear-groups, within the framework of traditional knowledge-systems, and with an understanding of local environmental and production factors, so that a legitimate efficiency threshold can be fixed.

Issues for consideration

- Should fishing power be limited or reduced to prevent overfishing? If so what sort of measures should be considered (e.g. limiting size of boats, engines and gear)?

Can moratoria on fishing (i.e. closing fishing grounds) result in regeneration of fish stocks? What sort of difficulties are likely to be encountered by calling for limits or reductions to fishing power?

- Should certain fishing technologies (e.g. bottom trawling) and practices (e.g. intensive prawn and salmon aquaculture) be banned, for example those fishing techniques and practices which can cause resource degradation?

What experience is there of fishing practices which deplete fish stocks and cause environmental degradation? Is there any experience of effective actions being taken against such practices?

How could such a ban be implemented, and what sort of problems might be encountered?

- What criteria should we use to determine technology choice and levels of fossil fuel use? What sort of trade-offs should be made between labour-intensive, capital-intensive and energy-intensive technologies?

Background Note Technology and Energy Use in Fisheries

Background Note

Technology and Energy Use in Fisheries

What is the trade-off between decentralization and centralization in fish production, processing and marketing?

- What is the experience of technology and energy use in relation to labour? For example, has the introduction of mechanized fishing led to an increase or decrease in the number of jobs (e.g. crew size, shore-based work)?
- Have centralized fish processing facilities affected decentralised community based fish processors and marketers? What sort of new jobs have been created as a result of the introduction of new technologies?
- What is the experience with industrial scale fishing? Who benefits from such large scale investments? Can the activities of industrial scale fishing be regulated and controlled by monitoring, control and surveillance measures? What sort of experience is there in this area?



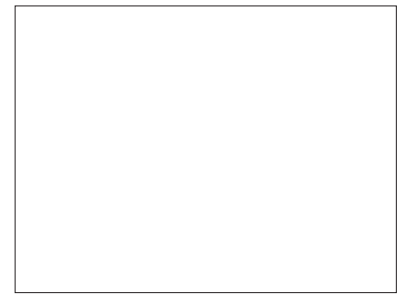
About a third of the world production in fisheries enters international trade, and this share has remained more or less the same during the past twenty years. Total export of fish and fishery products increased from 5 million tonnes in 1963 to about 18 million tonnes in 1991. In terms of quantity, developing countries increased their share of total volume of exports from 34 per cent in 1963 to 52 per cent in 1991. However, in terms of value, their share increased from 25 per cent in 1963 only to 45 per cent in 1991.

Development and diffusion of freezing technology, adoption of new gear material and fish harvesting methods, declaration of exclusive economic zone (EEZ) and the expanding global demand for marine products have considerably 'internationalised' the fisheries scene in the past two decades. The significance of these events is mixed and it may be difficult to have a uniform perspective on their impacts. The following sections discuss the pros and cons of the significance to fishworkers of trade, international agreements, aid and technical assistance in fisheries, particularly in the developing countries.

Impact of Trade

There are contesting views on whether exports benefit or adversely affect fishworkers, especially in the developing countries. While some argue that exports deprive the poor people within the country of cheap protein, others disagree. Does export of fish actually deprive the poor of protein?

Fish is protein, but its consumption by people to a large extent depends on food habits. For customary or religious reasons, sections of population may be opposed to eating



Background Note **Transnational Linkages** **in Fisheries**

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Background Note

Transnational Linkages in Fisheries

fish. There are poor countries in Africa who prefer to eat beef instead of fish (Mauritania, Morocco, etc.) even though fish is available in large quantity. There are for instance fishermen on the north-west coast of India who are strict vegetarians. For religious reasons, Jews and certain Christian sects are forbidden from eating fish that do not have scales. For those who consume fish, it is often associated with specific types and they do not consume just any kind of fish. The Papua New Guinea people, for example, prefer to eat imported canned mackerels from Japan and Europe instead of their own local catch (only about 30 per cent of the fisheries potential is tapped in Papua New Guinea!).

Using non-destructive fishing gears, many artisanal and small-scale fishing groups in developing countries catch marine stocks such as prawns, squid and cuttle fish. Because of competition among the traders for these economically valuable species, the fishermen get a better price and realise a better income in comparison with what they earn from supply to the domestic market of fish like sardines and mackerels. However, investment in destructive fishing techniques from outside the sector can cause stock depletion and undermine the sustainability of the small-scale fishery (e.g. prawn trawling in Kerala, India).

Development of fish production and processing activities in response to export potential can contribute to an increase in employment opportunities in the developing countries. Joint ventures as well as local initiatives in developing countries have contributed to better employment opportunities, especially for women. Canneries have either moved from the North to the South in the past two decades, or have been closed down in the North because of inability to

compete with processing plants in the South. About 90 per cent of prepared and preserved tuna, for example, came from the South in 1991, and Thailand alone accounted for 52 per cent of the global market. However, the work conditions and remuneration leave a lot to be desired.

Developments in the export market that have negative impacts on domestic fish supply and on the coastal environment however have to be discouraged. Adequate safeguards have to be made to prevent the export of fish that contributes to nutritional requirements of the local population. Aquaculture practices, especially intensive aquaculture, with poor water and waste management as well as removal of gravid females and fry from the wild have to be discouraged, since they have adverse implications for coastal fish production and the livelihood of fishworkers.

Impact of International Agreements in Fisheries

International agreements in fisheries refer to granting of access to surplus fish stocks within the national jurisdiction to foreign fishing vessels against the payment of stipulated fees, usually in hard currency. The agreements between the European Union (EU) and the African countries are matters of concern for artisanal fishworkers in countries like Senegal. Given the total absence or impotence of monitoring, control and surveillance mechanisms in these countries, vessels that come under these agreements often violate the stipulated conditions and create hardships to the artisanal fishworkers.

Formation of appropriate bodies for negotiation and supervision of international agreements in fisheries with adequate representation of fishworkers' representatives is an

Background Note **Transnational Linkages in Fisheries**

Background Note

Transnational Linkages in Fisheries

essential prerequisite for minimising negative impacts of these agreements. The flag state should take responsibility and compensate for violations of stipulated conditions by their vessels. There should also be provisions for sufficient punitive measures against erring vessels under the agreement. Also, the process of concluding these agreements should be made sufficiently transparent. These measures will ensure that the access of artisanal fishworkers to their traditional fishing grounds is not threatened, their crafts and gears are not accidentally destroyed, and that the boundaries of traditional waters are respected by the foreign vessels.

Impact of Aid and Technical Assistance

While some transnational linkages are beneficial mainly from the employment point of view, certain others have deleterious effects. External assistance programmes were instrumental in the introduction of bottom trawling in several countries. Development of bottom trawling has not only led to severe pressure on some bottom dwelling species like prawns, but also has led to competition for resources and space in the inshore waters. This has often erupted into open conflicts between gill-net and trawl gear-groups. Modern technical interventions without a thorough understanding of cultural and social ethos that govern traditional harvesting, processing and marketing activities have caused considerable waste of resources in many African as well as Asian countries, and have dislocated several traditional fishing practices.

GATT and Fisheries

Fish and fish products, unlike agricultural products seem to be traded internationally under relatively lower tariff re-

gimes. With a few exceptions, fish and fish products can be exported at tariffs below five per cent to markets like Japan, USA and the EU that account for bulk of the world market. However, some of the highest tariffs in developed countries apply to products such as canned tuna and canned sardines, which are of major export interest for developing countries. For example, France, which is the largest importer of fisheries products in Europe, levied 24 per cent tariff on canned tuna and 25 per cent on canned sardines in 1986. The United States has tariff quotas for canned tuna, determined in relation to domestic production, and imports beyond this quota are levied very high tariffs, e.g. 35 per cent in 1986 for canned tuna in oil.

However, the Uruguay round seeks a reduction of tariff rates on industrial products, in which group fish and fish products are included, by a third. It is estimated that the actual reduction will be in the order of 39 to 41 per cent on average. According to calculations made by the GATT Secretariat, 45 per cent of the imports (in value terms) will be paying between 0.1 and 5 per cent, 23 per cent between 5.1 and 10 per cent, and 9 per cent between 10.1 and 25 per cent. 23 per cent of the imports will not have to pay any tariffs. Imports of fish and fish products subject to tariffs between 15 and 25 per cent would decrease from 7 to 3 per cent.

While adversely affecting producers and processors enjoying subsidies, especially in some developed countries, lower tariffs are likely to benefit the exporters from developing countries. Fish production in the developing countries take place at lower costs and are not subsidised to the extent in many developed countries. This will help the exporter from

Background Note

Transnational Linkages in Fisheries

Background Note

Transnational Linkages in Fisheries

developing countries to compete more effectively under low tariff regimes in the international market. Ensuring healthy competition among exporters would help enhance the share of the export price that would accrue to the fishermen. However, care has to be taken to ensure that species whose demand outweighs supply are not subject to overfishing.

In normal circumstances, the inputs that are imported into the fisheries could also benefit from reduction of tariffs if there are no currency devaluations. But, this may also act as an incentive to enhance efficiency of fishing operations with implications for sustainability of fish stocks.

While the fishworkers from the developing countries are likely to benefit, those from developed countries who already enjoy a certain degree of protection are likely to suffer from reduction of tariffs. This is especially in situations when they may have to supply to the domestic market fish that can be imported cheaply from developing countries.

However, if local production commands a premium price in the domestic market at a price higher than what prevails in the international market, the local fishermen will not be threatened by tariff concessions that are given to imports. Such a situation is possible only if the local products enjoy considerable demand and are not substitutable by imports. The fresh fish market in Japan for some of its coastal fish and fish products is an example. Certain species of high quality fresh fish commands a higher price in the Japanese market in comparison with the price of similar species that are imported.

Environmental standards are increasingly becoming a topic for inclusion in GATT. In negotiating international agreements on environmental standards, developing countries may wish to ensure that such standards are not used for protecting domestic production in developed-country markets and to restrict imports from developing countries.

Issues for consideration

- What are your views on development of export market for fish and fish products? Do you think fishermen should primarily cater to protein requirements of the domestic population before considering export options?
- What is your experience with the export market in relation to the domestic one? Does the export market help fishermen to earn a better income than the domestic market? Do traders pay a better price for exportable varieties of fish? Are there substantive differences in the earning capacity of those using gears like trawls and purse-seines, and those using passive gears?
- Are there instances of export-led fisheries development contributing to environmental degradation and overfishing in your country? Do gear-groups primarily catering to the export market conflict with those gear groups catering to the domestic market?

Background Note

Transnational Linkages in Fisheries

Background Note

Transnational Linkages in Fisheries

- What is the nature of joint-ventures in your country? Do they create new employment opportunities for the local communities?
- What are the developments in processing industry in your region? Are they providing new employment opportunities for the local communities?

Do they, on the contrary, displace labour from their traditional occupations? How about work conditions, remuneration, social security, etc.?

- Would you like international agreements in fisheries to be dismantled, or would you like to accept them after redefining the terms and conditions of such agreements?

In the latter case, what sort of redefinitions in general should they be subjected to?

- What are your views on liberalisation of fish trade? Do you think it can adversely affect fishworkers, if so, how?

Do you agree that liberalised fish trade will make the fishworkers of the South better off and those of the North worse off?

