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Ruining the Commons and Responses of the Commoners: Coastal Overfishing and Fishermen's Actions in Kerala State, India

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Preface

The following paper gives a history of the fishery development process in Kerala state, India. It documents the ruin of the coastal commons caused by the over-intensive fishing techniques which were encouraged by official development plans, and describes the responses of the commoners to the destruction of their resource base. Special emphasis is given to the people's interactions with the state in their efforts to overcome the problems brought by capital-intensive development to the traditional fishing sector. The paper was prepared as part of the UNRISD research programme on **Sustainable Development through People's Participation in Resource Management**, which explores the dynamics of local level initiatives concerned with environmental degradation, examines and analyzes traditionally sustainable resource management practices, and investigates the factors which facilitate or constrain community participation in externally initiated resource management projects and programmes. At UNRISD, the programme is being co-ordinated by Jessica Vivian.

The author of this paper has been involved in research into the economic, social and ecological dynamics of the fishing sector of Kerala for over 10 years. He has been a member of various task forces on fisheries and natural resources in Kerala, and has worked as a consultant for several international agencies. He is currently Associate Fellow at the Centre for Development Studies in Trivandrum, India.

The paper opens with a discussion of the factors which have led to the over-exploitation of the coastal waters of Kerala since the mid-1960s. Rising international demand meant that the fishing sector became an important contributor to the state's foreign exchange earnings, and government support for investment in this sector was sufficient to overcome the previously prevailing social barriers to entry raised by the caste system. Subsidies also helped to introduce more efficient – and more destructive – fishing technology, with which the traditional, ecologically sound fishing techniques were unable to compete.

By the mid-1970s, the years of over-exploitation had resulted in stagnating or declining harvests. Productivity in the fishing sector was down, with decreased catches and smaller fish caught. Real incomes of fishworkers declined even as rising prices meant a decreased availability of fish for local consumers. In addition, there was a growing income and asset disparity between the traditional fishing population and the newly arrived non-worker owners of large mechanized fishing boats.

The collective and individual responses of the fisherfolk to the resource crisis are analyzed in the second half of the paper. The author emphasizes the evolving socio-economic and techno-ecological forces which shaped the traditional fisherfolk's actions, as well as the diversity and, at times, contradictory nature of the responses. The first step toward collective action was the development of a sense of unity based on class, rather than on caste of community. By the end of the 1970s an independent trade union had been established to articulate the traditional fishing communities' protests over commercial over-exploitation, and to channel the growing unrest. The increased political awareness and organization skills of the fisherfolk meant that the state government could no longer ignore the needs of this community, nor take their votes for granted. By 1989 some of the main demands of the fishing community, including a monsoon-season ban on trawler fishing, had been met, although subsequent events showed how fragile this victory was.

The author concludes by arguing that the traditional fishing community is most affected by the ecological damage done to the coastal resources by commercial fishing fleets. The short-term time horizons of the capitalist trawler owners, and their ability to transfer their resources to other sectors once profits decline, mean that they have a much smaller stake in the survival of the ecosystem than do the artisanal fishworkers who are, through lack of alternative opportunities, tied to the sea. However, it is precisely the mobility of the capitalist class which

gives them disproportionate bargaining power over the establishment of resource management regulations.

Ongoing UNRISD work on the theme of sustainable development and people's participation will investigate further some of the issues raised by this paper. As one of the programme's areas of focus, the origins, strategies and achievements of popular initiatives which impact upon the environment will be examined. Particular emphasis will be placed on the implications of the UNRISD studies for national and international development policy.

April 1991

Dharam Ghai
Director

Introduction

The last words have yet to be pronounced on the ruin of common property resources and the nature of collective action which is initiated in response to such a situation. Influential opinions on both these issues have, however, greatly conditioned the general thinking on these matters.

As regards the first – the ruin of common property resources – the phrase “tragedy of the commons”, authored by Hardin (1968), has become the stock response when one hears about increasingly numerous examples of the degradation of our planet’s common heritage. Hardin pronounced that **whenever** many individuals freely use a common property resource it is doomed to be degraded and will bring ruin to **all**. The emphasis in his article was largely on the **numbers** of “rational persons” – their increasing population – that take the toll of the commons.

The second issue – collective action vis-à-vis the ruin of a commons – though less well known and discussed, occupies the mind of numerous academics and policy makers (Berkes, 1986; Chopra, 1990; Netting, 1981; Oakerson, 1988; Ostrom, 1989; Runge, 1986; Siy, 1982). The earliest of these thoughts which tend to dominate current thinking on this issue emanate from Mancur Olson’s well known book entitled **The Logic of Collective Action** (Olson, 1965). Olson was of the opinion that the mere presence of a perceived benefit for a group was **not** sufficient to create collective action possibilities to achieve that benefit. He argued emphatically that “... unless the number of individuals is quite small, or unless there is coercion or some other special device to make individuals act in their common interest, **rational, self-interested individuals will not act to achieve their common or group interests**” (Olson, 1965: 2, emphasis in the original).

Hardin’s pronouncements and Olson’s predilections are not only conditioned by their respective academic penchants, but also very much by the nature of the materialistic and individualistic societies in which their ideas were conceived. These ideas therefore present a very limited perspective of the issues they address, and they are of limited applicability in a cross-cultural context. When commons are seen merely as a source of recreation, and collective action as the privilege of corridor lobbyists, the conclusions of the theoretical work articulated in the 1960s may be valid. However, in the context of the Third World and the vast arenas of interface between common property resources and survival strategies of millions who depend on such resources for a livelihood, there is greater need to delve beyond unidimensional explanations for tragedies and strait-jacketed responses to collective action. We need to analyse the numerous, often mutually reinforcing factors that lie behind the ruin of a commons, as well as the plethora of actions – collective and individual – sometimes conflicting and counterproductive, which arise in response to this situation.

In the context of the current euphoria for sustainable development and people’s participation, the above issues attain a new significance. Common property resources – particularly of the renewable nature – are of prime concern in the sustainable development scenario, and collective action is one important facet which shapes effective people’s participation. Sustainable development is premised on a basic notion of intergenerational equity and people’s participation postulates a degree of effective collective control in achieving this.

The role of the state is central to the nexus between common property resources and collective action, sustainable development and people’s participation. The role of the state in defining the boundaries of common property resources and sustainable development strategies, as well as in prescribing the limits of collective action and people’s participation, are well known. And if we do not subscribe to the “neutrality of the state” theory, we must reckon with the fact that the state’s role in delineating the contours of these issues is indeed crucial.

In this paper we propose to give substance to some of the above thoughts by analysing the economic and ecological crisis resulting from the ruin of a commons – the coastal marine fishing grounds of Kerala state, the south-western maritime province of India – and the responses of the commoners – the traditional, artisanal fisherfolk – to this situation. The attempt will be to highlight this crisis as the result of a **combination** of economic, technological and social factors inherent in a specific context. We will demonstrate that the ensuing detrimental economic and social consequences are by no means equitably distributed. We will also illustrate how the responses at various levels may be collective or individual, and are unlikely to be uniform or necessarily serving to mitigate the crisis. The role of the state and the dilemmas it confronts in striving to cater to the varying interests it serves will also be highlighted. That sustainable development and people's participation are sterile without participatory development and sustainable participation is an important conclusion of the analysis.

The paper is divided into two main parts.

The first deals with the question of the ruin of the coastal commons. Here we begin with a backdrop which very briefly sketches the relevant aspects of the history of the fishery development process in Kerala state. It further enumerates the various factors leading to the overuse of the commons – called overfishing in fishery parlance, provides the available evidence of overfishing, and assesses the varying impact of overfishing on the different interest groups.

The second part deals with the various responses of the commoners and the interface with the state. This is mainly a diachronic narrative of the crucial responses and the various dilemmas faced by the fisherfolk in their pursuit of ensuring a sustainable future for themselves and fishery resources. The manner in which the state attempts to balance the several social forces that place claims on the commons and its produce will also be assessed. Thoughts on ways to resolve the crisis will form a tailpiece.

1. Ruining the Commons

1.1 Backdrop

Fishing, as a subsistence occupation of a caste-bound community, has a long and hoary tradition in India. Traditional marine fishing communities have evolved, over the centuries of learning-through-labour, a keen understanding of the aquatic ecosystem, and have perfected fish harvesting artefacts which were appropriate to that milieu. Their technology was appropriate for fishing merely as a source of meagre livelihood. Such a situation obtained in India until independence in 1947.

Fisheries gained importance with the onset of post-independence economic planning in India. The long coastline and the productive continental shelf gave fisheries the status of a sector capable of accelerating the growth of the rural economy of the country. Accordingly, planned marine fisheries development had the multi-faceted objectives of increasing the fish harvest, improving socio-economic conditions of fisherfolk, augmenting export earnings and generating new employment opportunities. These objectives were to be achieved through initiatives promoted by the state and private efforts.

In order to meet these objectives the “modernization growth-oriented” model of development, largely premised on the experience of the more developed temperate water maritime countries, was accepted. This approach primarily implied the superimposition of a modern, capital-intensive, specialized technology over the existing traditional base which was largely

labour-intensive and of great technical diversity. It assumed that this base was a hindrance to development and had to be either transformed or completely phased out.

In Kerala state, the leading maritime state of India, the approach to fisheries development was initially radically different. The state's fishery policy in the first decade of planned development – 1956 to 1966 – can be summarized as having been based on “the judicious exploitation of marine resources by effectively and gradually raising the productive capabilities of the existing facilities giving primacy to the accumulated skills of the fishermen” (Kurien, 1985).

During this phase increased fishing effort was applied by artisanal fishermen using their traditional non-mechanized craft and a wide array of fishing gear and tackle. There was a rapid change from cotton to nylon nets. The overall fish harvest, and that of species like prawns, increased substantially.

This approach did not last long. By the mid-1960s the “modernization growth-oriented” model was introduced in Kerala. The single most important factor responsible for this was the rising demand for prawns in the international market. The waters off Kerala, being one of the world's richest resources for the penaeid prawns, virtually became the main “breeding ground” for this model.

Fisheries development in Kerala state soon became synonymous with increasing prawn harvest and foreign exchange earnings. With the phenomenal rise in the number of small trawlers – introduced initially by the former Indo-Norwegian project – the prawn harvest and export earnings increased steadily. The earlier caste-bound nature of the fishery sector ceased to be a barrier to entry, and the main investors involved in the new development model were non-fishermen (for details of this see Kurien, 1985). For a decade – until the mid-1970s – it was smooth sailing. However, the direction of the tide changed after 1974. The levels of overall fish and prawn harvest began to fall, and by the end of the 1970s the marine fishery sector of the state was heading toward an ecological crisis of overfishing.

The artisanal fisherfolk, who were only peripheral beneficiaries of this modernization model, responded to the crisis at two levels. The more rapid, widespread and vocal response was in the form of organized protest demanding state regulation of what they perceived as destructive fishing methods. The slower response was in the form of adoption of new technologies for propulsion of their fishing crafts and greater investments in fishing gear in a desperate attempt to enhance their share of falling harvests. They also made more localized attempts to rejuvenate the resource in the coastal commons using their traditional knowledge and reviving age-old practices in this regard.

Overfishing not only implied a fall in the fish harvest but led to a very skewed distribution of the benefits and costs of the fish economy. This in turn came to have larger socio-political implications which plague the state today.

1.2 The Meaning of Overfishing

Overfishing of the near-shore marine waters – the coastal commons – is a problem besetting many developing countries today. It is however rather complicated to decide with precision the stage at which the coastal commons get overfished (for a theoretical understanding of the issues involved see: Beverton and Holt, 1957; Caddy, 1984; Gordon, 1954; Hannesson, 1978; Panayotou, 1982; Pauly, 1979; Schaefer, 1954). The evidence available points to the fact that overfishing has come as a result of many interrelated factors of which the “common property” nature of these marine waters is but one.

It is customary to distinguish between two types of overfishing: economic and biological.

Economic overfishing occurs when marginal costs of an additional unit of fishing effort are higher than marginal revenues. The economy experiences loss (even though total fish catch may still increase) because of a misallocation of capital and labour which might have produced higher economic yields in alternative activities.

Biological overfishing occurs when the marginal yield of an additional unit of fishing effort is negative.¹ At such a level of effort the fish population stock is prevented from generating its maximum sustainable yield.²

Overfishing, or the application of excessive fishing effort, thus in a sense heralds a turning point in the dynamics of exploitation of a fishery resource. It is the threshold of “development” and the last call for “management”. It is a juncture, which if left unattended could spell ruin to much of the fishery resource and to a significant section of those whose lives are dependent on it.

In the context of developing countries it would therefore be appropriate to seek policies which avoid problems of excessive effort. This can be achieved through management measures that seek to **maintain** a development process of the fishery which will keep the resource at a high level of productivity by matching fishing effort to the biological and ecological condition of the fish stock.

To achieve such a desirable situation presupposes not merely an attack on the **effects** of overfishing the coastal commons but rather a clear understanding of the factors which caused it in the first place. Before embarking on this task an appreciation of the nature of the fishery resource is in order.

1.3 The Fishery Resources of Kerala

The sea off the south-west coast of India, comprising the maritime states of Goa, Karnataka and Kerala, forms a relatively homogeneous aquatic eco-zone. The inshore or coastal waters (up to a depth of 50 metres) of this region measure 23,400 square kilometres and have a maximum sustainable yield (MSY)³ of 700,000 tons (George et al., 1977). The average fishery productivity potential of these waters works out to 30 tons per square kilometre (or 300 kilograms for every hectare) making it the most productive fishing zone in India. (The all-India figure is 12.5 tons per square kilometre.) Kerala state accounts for just 12,570 square kilometres of this coastal sea area which has an estimated MSY of 400,000 tons.

The fishery resources in the tropical seas off Kerala state are marked by the multitude of species attaining varying sizes at the age of maturity. They are widely dispersed in the coastal commons and each species is available in relatively small quantities. There are complex prey-predator relationships between them as well as competition for food.

The above are distinctly different from the characteristics of fish resources in temperate waters. In temperate waters one finds a relatively smaller number of species which grow to larger sizes and each species is available in teeming millions. The inter-species interactions

¹ In tropical multi-species fisheries, biological overfishing may occur even though total catch is still increasing because the decline in yield – or complete extinction – of one or several species may be compensated through higher yields of other species.

² Biologists further distinguish between “growth overfishing”, “recruitment overfishing”, and “ecosystem overfishing” depending on which is the most important factor preventing full recovery or growth of the stock (Pauly, 1979).

³ The maximum sustainable yield (MSY) is subject to changes due to biological and ecological factors. Hence, MSY estimated for a year need not be the same for all years. The estimates quoted here are taken from George et al., 1977, and are the only available and comprehensive estimates made so far.

are also less complex than what obtains in the tropical waters, making it easier to “target” fishing operations to specific species.

Fish species are generally divided into two broad categories in accordance to the niche that they usually inhabit in the marine environment. Pelagic species are the predominantly surface-dwelling fishes, while the demersal species are those that generally inhabit the bottom of the sea. The behaviour and life cycles of pelagic species are more prone to influences of oceanographic conditions like changes in water temperature, salinity, dissolved oxygen content and so forth. Demersal species remain largely unaffected by such changes.

For the purpose of data collection the numerous fish species of Kerala have been grouped under about 54 broad names. The fish harvest pattern of 1984-1985 indicates the important species to be: oil sardines, mackerels, anchovies, ribbon fish, carangids (all pelagic), penaeid prawns, soles, sciaenids, perches and catfish (all demersal). Of these, oil sardines, mackerels and penaeid prawns have traditionally been considered the three prime economic species. Their MSYs are estimated to be 126,000 tons, 56,000 tons and 56,000 tons respectively.

1.4 Factors Contributing to Overfishing

There are several factors contributing to excessive fishing effort in a fishery. We will restrict our assessment to five major areas: (a) the open access nature of the fishery; (b) the use of inappropriate technology; (c) the demand-pull factors that create galloping prices; (d) financial subsidies offered by the state which encourage investment; and (e) the pressure of population on the coastal commons.

(a) Open Access Nature

When traditional technologies and the custom-bound organization of the fish economy predominated, the common property nature of the marine fish resource did not pose a major problem. Technical barriers, such as the need to have fishery-specific skills, and social barriers, such as fishing being the occupation of a lower caste, prevented free entry of capital and persons from outside the traditional fishing communities into the fishery.

The introduction of mechanized boats and the perceived profit opportunities from involvement in activities such as prawn exporting changed this scenario considerably. The vibrant merchant class of Kerala took the first initiatives to break these barriers. They shifted some of their capital from land-based activities – such as coir and cashewnut exports – to fishing, processing and exporting of prawns. Rapid entry was facilitated by the free access to the sea: mechanized boats could be operated without any form of licence or registration. There was also no regulation limiting the ownership of fishing assets only to those who were active fishermen. As a matter of fact, entry into the fishery was given greater impetus by the liberal financial assistance of the state (more details about this below). As a result, the post-1966 period witnessed a considerable influx of non-fishermen owners of fishing assets – particularly mechanized trawlers. Between 1966 and 1985 the number of trawlers increased from a couple of hundred to around 2,800.

(b) Use of Inappropriate Technology

Traditional fishing technologies (nets, tackle and methods of fishing) were in general evolved to suit the particular ecological context of the seas and the varying behaviour patterns of the fish. Deserving special mention is the selective nature of fishing nets (a special mesh-size/shape for catching a specific species of fish) and the “passive” nature of fishing operations (allowing fish to get entangled in the net rather than going in hot pursuit of them or catching them by disturbing their milieu).

As indicated earlier, the “modernization” phase of fisheries development was premised on the need to introduce fishing crafts, gear and methods which were proven efficient in the

temperate water milieu. These tended to be “active” fishing techniques using single gear combinations invented for the fishery resources of the temperate waters. Trawling (the method of scraping the sea bottom with a bell-shaped net to catch demersal fish) and purse-seining (the method of quickly encircling whole shoals of pelagic fish) were two such techniques introduced after the decade of the 1960s.

Both these techniques were very capital-intensive and initially raised labour productivities. In the short-run, unit harvesting costs were low, and given the high prices of certain species of fish (see below), the profits to owners very high. This led to a rapid increase in numbers and the extensive use of these techniques. This contributed very significantly to overfishing by destroying the sea-bottom eco-niche (trawling) and by indiscriminate and non-selective fishing of whole shoals of pelagic fishes (purse-seining).

(c) Booming Demand

The introduction of trawlers into Kerala coincided with the rise in demand for prawns in the international market. This was spurred by factors such as the enhanced growth of the United States and Japanese economies and also the former’s loss of access to supply from China. These demand-pull factors were outside the control of the local economy, and it was difficult to prevent fishery resources from being harvested in response to them.

From a commodity formerly used to provide manure for coconut palms, prawns grew to become the “pink gold” of marine exports from India. In 1961-1962 the beach price of prawns was only 240 rupees per ton – less than even the price of mackerels which were considered the “poor man’s protein”. In 1971-1972 prawn prices reached 1,810 rupees per ton. Between then and 1984-1985 prices increased nearly sevenfold while the prices of oil sardines and mackerels rose by 184 and 213 per cent respectively (Table 1).

Table 1						
Trends in Prawn and Fish Prices in Kerala (current prices; index: 1971-1972=100)						
	Prawns		Oil Sardines		Mackerels	
Year	Rs/Ton	Index	Rs/Ton	Index	Rs/Ton	Index
1961-1962	240	13	90	24	340	38
1971-1972	1,810	100	380	100	890	100
1976-1977	7,260	401	850	224	1,600	180
1984-1985	14,120	780	1,080	284	2,790	313

Source: Department of Fisheries, Kerala State: **Administration Reports** (several years).

In the case of the domestically consumed fish species – oil sardines and mackerels – there is evidence to show that the increased prices were the result of the inability to enhance the harvests in keeping with the growing demand for fish from the local population (Kurien, 1978). Purse-seiners were first introduced in Kerala in 1976. Until then oil sardines and mackerels were caught exclusively by fishermen using traditional crafts and gear.

(d) State Subsidies

Following the adoption of the “modernization path” to fisheries development, the state became actively involved in promoting the direction of investments in the sector.

To give impetus to this policy, the state instituted many attractive subsidies for the mechanization programme. It invested in capital-intensive and long gestation infrastructure facilities such as harbours and landing centres. It also provided training facilities.

The initial spate of subsidies was very liberal. As much as 25 per cent of the cost of the hull of a boat and 50 per cent of the cost of its engine were provided as grants. The remainder was treated as a loan to be repaid in 64 instalments over a period of eight years at seven per cent interest.

In theory, all the 1,200 mechanized boats so issued by the state between 1961-1962 and 1977-1978 went to fishworker co-operatives or genuine groups of fishermen. In practice, however, this seldom happened, as is evident from the evaluation of these co-operatives by a government report which concludes: “the failure in the operation of the scheme of distribution of mechanized boats were [sic] due to the fact that the fishermen cooperatives to whom or through whom the boats were issued were all *benami* (under false name) cooperatives almost without any exception. The rich and influential among the fishermen sponsored and controlled the cooperatives” (Krishnakumar, 1981).

It was this realization which prompted the dropping of a similar scheme drawn up for the Sixth Five Year Plan (1980-1981 to 1984-1985), which envisaged providing subsidies and soft loans for the introduction of purse-seiners. Although the state dropped the scheme, the private entrepreneurs went ahead with finances provided by commercial financing institutions.

State subsidies for mechanized boats were completely withdrawn in 1973. From 1985 onward, following the rush of artisanal fishermen to obtain outboard engines, the state extended subsidies at the rate of 3,000 rupees per engine and 2,600 rupees per craft and gear. Though late, for the first time state subsidies were enjoyed by genuine fishermen! The rapid increase in outboard engines in Kerala state from a handful in 1982 to as many as 8,000 in 1988, is to a small extent due to these incentives.

(e) Population Pressure on In-Shore Waters

One characteristic of tropical water fisheries is that overuse of even low productive, passive fishing gear can affect the renewability of stocks (Pauly, 1979). The pressure exerted by increasing numbers of fishermen using increasing amounts of fishing equipment within the limited area of the coastal waters has this effect.

The active fishing population has been increasing at a rate of about 2.3 per cent per annum. In 1961 there were 80,700 active fishermen in Kerala. Given Kerala's coastal sea area of 12,570 square kilometres, the population density was about 6.4 fishermen per square kilometre, ensuring that on average each fisherman had 16 hectares of coastal commons to fish. By 1985, the population increased by 65 per cent to 134,000, increasing the fishing population density in the coastal sea area to 10.6 per square kilometre. This reduced the average coastal commons per fisherman to 9 hectares as against 30 hectares at the all-India level.

With the increase in the number of fishermen, total fishing assets also increased. Traditional fishing crafts increased from around 21,000 in 1961 to over 27,000 in 1986. More important are the increases in the quality and the quantity of fishing gear. During the last two decades, practically all the fishermen have shifted from using cotton to nylon nets. Though no aggregate estimates are available, evidence from village studies indicate that the quantum of fishing nets and other tackle has increased significantly (Achari, 1987a).

This fact became most evident with the post-1982 outboard motorization drive which was induced by declining productivity due to overfishing of the coastal commons (more details about this below).

This population-induced increase of fishing pressure can certainly be viewed as an issue which will now exacerbate the extent of overfishing if present trends continue.

The five above-mentioned factors which contribute to overfishing are complementary and mutually reinforcing. This makes the issue of economic and biological overfishing a very complicated matter to deal with.

1.5 The Evidence of Overfishing

Considerable data is now available to indicate that the above-mentioned factors have, in combination, led to the ecological crisis in the coastal waters of Kerala. The evidence with respect to some parameters is substantial but patchy in the case of others. The total picture that emerges, however, points undoubtedly to a scenario of strong tendencies toward overall economic and ecosystem overfishing with biological overfishing clearly established in regard to the most valuable species – prawn.

(a) Biological and Ecosystem Overfishing

Kerala state has been the leading maritime state, contributing between 20 and 35 per cent of the total marine fish harvest in India between 1956 and 1985.⁴ The total marine fish harvest in Kerala during this period fluctuated between 152,200 tons (1956) and 448,300 tons (1973). Within this the harvest of pelagic species ranged between 89,900 tons (1956) and 357,000 tons (1971), and that of the demersal species between 48,000 tons (1957) and 198,000 tons (1975).

One can discern two distinct phases in this time span of three decades: a phase of steadily increasing harvests – 1956 to 1973, and a phase of stagnating or declining harvests – 1973 to 1985. This broad periodization is valid whether one considers the total harvest, the harvest of pelagic and demersal groupings or the major economic species – oil sardines and mackerels, and prawns. This is evident from the growth rates shown in Table 2 for the two periods mentioned above.

Table 2		
Compound Growth Rates of Fish Harvest of Kerala State[#]		
Species Groups	Period I: 1956-1973	Period II: 1973-1985
Total marine fish harvest	3.23*	-1.79*
Total pelagic fish harvest	3.19*	-0.18
Total demersal fish harvest	3.52*	-4.60*
Total oil sardine and mackerel harvest	5.01*	0.60
Total prawn harvest	6.21*	-8.30*

[#] Estimated using semi-log function. * Significant at five per cent.

To establish that a decline in fish harvests points to biological overfishing conventionally requires that at least two more indicators exhibit a downward trend. These are (a) the catch per unit (fishing) effort (CPUE) and (b) the size of the harvested fish species.

In a multi-species fishery, these indicators can only be measured with respect to a particular species. In our case we have such data only with regard to penaeid prawns – the most

⁴ Output figures in this and other parts of the paper (unless otherwise mentioned) are taken from the published data of the Central Marine Fisheries Research Institute. Price data are taken from the Administrative Reports of the Department of Fisheries.

important economic species and the most controversial one in regard to the overfishing debate.

In the main prawn landing centre in Kerala (Neendakara) the catch per unit effort (CPUE) declined from 83 kilograms/hour of fishing effort in 1973 to 20 kilograms/hour in 1984 (George, 1988). Taking the three most important centres where trawler operations are concentrated (Neendakara, Cochin and Calicut), the CPUE for 1973 and 1984 are 50 kilograms/hour and 20 kilograms/hour respectively.

As regards the declining size of prawns, it is sufficient to quote one of the leading fishery scientists of the country who has specialized on the prawn fishery. On analyzing the variation in the size of prawns in the main landing centres, he cautions:

“Regarding the range in sizes of the different species at these centres, one important point which emerges from a comparison of the data of 1978 and 1983 is that in the case of both dominant species, namely *P. Stylifera* and *M. Dobsoni*, much smaller sizes are coming in the catches of 1983 when compared to that of 1978. Along with the range in sizes there is also a drop in the sizes of the major groups represented in the fishery. This should be a feature strengthening the suspicion about the depletionary tendencies noticed in the shrimp fisheries of Kerala and another point of concern from the conservation approach.” (George, 1988)

Another overall indicator, pointing at least to the possibility of ecosystem overfishing, is the decline in the catches of the demersal species of fish. As indicated earlier, these bottom-dwelling species are largely unaffected by nature-induced changes in their ecosystem. Hence, both the increase and the decline in their harvests can be attributed to man-induced interventions in the form of fishing. Between the years 1971-1975 and 1981-1985, the harvests of nearly all the important demersal species registered a sharp decline (see Table 3). This can largely be attributed to excessive or destructive fishing – particularly the use of trawlers.

Table 3					
Demersal Fish Harvest in Kerala (000 tons)					
Species	1971-1975*	1976-1980*	1981-1985[#]	Per cent change[@] from 1971-1975 to	
				1976-1980	1981-1985
Catfish	22	11	10	(50)	(55)
Perches	10	16	7	60	(30)
Sciaenids	10	9	5	(10)	(50)
Leiognathus	11	4	5	(64)	(55)
Prawns	59	41	29	(31)	(51)
Others	36	30	38	(17)	6
Total	148	111	94	(25)	(36)

Source: * Babu, 1982; [#] Government of Kerala, 1985. [@] Figures in brackets indicate percentage decline.

(b) Economic Overfishing

That economic overfishing had set in by the advent of the 1980s can be gleaned from the evidence of profitability calculations made for the trawler fleet at different points in time.

In 1968-1969, trawlers in Kerala (above 10 metres in length) operated on average for 160 days and landed 30 tons of fish valued at 34,500 rupees incurring a total operating cost of 26,700 rupees. Net income after depreciation and interest worked out to 7,800 rupees or a 14 per cent return on the investment (Government of India, 1971). In 1978 an enquiry conducted by the Kerala State Planning Board indicated a net return on investment from trawling boats of 8.6 per cent (Government of Kerala, 1979). Results from an FAO/UNDP-sponsored study indicated that in 1980-1981 trawlers operated on the average for 157 days and landed 19 tons of fish valued at 92,300 rupees, but incurring a larger total cost. This resulted in a negative rate of return (Kurien and Willmann, 1982).

A Task Force of the Government of India observed:

“Due to the introduction of powerful engines and longer hours of operation, the consumption of diesel has increased considerably. In 1971, the average daily consumption of diesel by a boat was only 75 litres. It rose to 100 litres in 1976 and to 150 litres in 1981. Also the catch per unit effort has come down very much in the last five years, as more number of boats were operating in the same fishing grounds. The daily average catch around August 1981 was about Rs. 825 as against the total cost of operation of Rs. 1,283 per boat.” (Government of India, 1982)

All the above figures are averages. The profitability range was likely to have been large. Despite “average losses”, it is reckoned that as much as a third of the fleet was operating profitably. This fact, coupled with the fluctuating nature of fortunes from fish harvests, provides a strong incentive for marginal loss makers to continue in the fishery. They pin their hopes on a bumper catch in the near future which could wipe out their accumulated losses.

There is another important reason for the continued expansion of the fleet despite the overall profitability decline indicated by the cost-earnings calculations. Having initially obtained subsidies and long-term loans from the state, the owners of several boats have defaulted in their repayments. In fact, since most of them have appropriate political connections, the repayment of loans seems more closely correlated to one's contacts rather than the economics of the operation of one's boats. This makes the **private** return from the boats to the owners still lucrative when calculated on the basis of their **own** investments in it! In March 1986, a provisional estimate of the government of Kerala assessed the total accumulated arrears on government loan repayments due from mechanized boats (mostly trawlers) to stand at 75 million rupees. Of this, 58 million rupees was the principal amount – or 42,000 rupees per boat, which on the average was about 30 to 40 per cent of the investment cost. The experience of the commercial banks in this regard is unlikely to have been very different.

An Expert Committee was appointed by the Government of Kerala to study the question of resource depletion and overfishing (see Table 4). This Committee was of the unanimous opinion that the investment in Kerala's coastal waters as of 1985 was far above the desirable optimal levels.

Table 4				
Estimates of Excess Fishing Craft in Kerala				
Craft Type	Existing Number [#]	Committee Recommendation [*]	Excess Number	Per cent
Trawlers	2,807	1,145	1,662	59
Purse-seiners	54	nil	54	100
Motorized crafts	6,934	2,690	4,244	61
Non-motorized crafts	20,170	20,000	170	negligible

Source: [#] Department of Fisheries (personal request, September 1986. Mechanized gill-net boats not accounted for here). ^{*} Kalawar, 1985.

From these calculations, it was estimated that the extent of overcapitalization in the fishery was of the order of 530 million rupees – an amount equal to the total development assistance given by the state to the fisheries sector in Kerala during the three decades of planned development (Achari, 1987b).

The economic, ecosystem and biological aspects of overfishing are integrally linked. They reinforce a downward spiral which could in time lead to the complete collapse of the fishery.

1.6 Impact of Overfishing

The impact of overfishing has dampened the growth of the fisheries sector and widened the gap between it and the rest of the state's economy. The major economic brunt of this was borne by the fishworkers and their families, while the adverse nutritional impact was borne by the local consumers – particularly the poorer among them.

(a) Disparity Between Sectors

Recent estimates made by the state government indicate that the per capita state domestic product (SDP) is increasing faster than the per capita fishery sector product (FSP). In 1973-1974 when the per capita SDP was 811 rupees, the per capita FSP was 18 per cent lower. By 1980-1981, the gap increased to nearly 30 per cent and quick estimates for 1986-1987 place the per capita SDP at 2,371 rupees and the per capita FSP at 1,415 rupees – a difference of 40 per cent. Though the population growth of the fishing community is higher than the state average, this increasing disparity is primarily due to the slower rate of growth of the fishery sector product. This is due to the change in the composition of fish harvests toward species commanding lower market values following the overfishing of high-value species.

(b) Productivity and Incomes of Fishermen

The productivity of the working fishermen dropped significantly with overfishing. Incomes, however, did not plunge to abysmal levels because shore prices of fish exhibited considerable increases. They rose from around 1,260 rupees/ton in 1974 to 2,300 rupees/ton in 1982. The trends in productivity and income were similar for both the workers on the mechanized trawlers and the artisanal fishermen working with their traditional crafts.

Taking 1974 as a base, we see that productivity and income levels declined across the board. Trawler crews which harvested 10 tons of fish in 1974 landed only 7.7 tons in 1982. Their real per capita incomes during this period fell by 45 per cent from around 2,700 rupees to 1,500 rupees. In the case of the artisanal fishermen, the extent of setback was similar. Productivity registered a 50 per cent decline between 1974 and 1982 – falling from 3.3 tons to

1.6 tons. Real per capita incomes also dropped from 850 rupees to 420 rupees during this period (see Table 5).

Table 5				
Productivity and Income of Fishermen in Kerala				
	Fishermen on Trawlers		Artisanal Fishermen	
Year	Productivity (tons/year)	Income* (rupees)	Productivity (tons/year)	Income* (rupees)
1961	NA	NA	3.54	330
1965	NA	NA	3.82	380
1969-1970	5.15	790	3.34	630
1974	10.04	2,700	3.20	850
1979-1980	7.54	2,630	1.78	540
1982	7.70	1,560	1.62	420

* In per capita terms in 1960-1961 prices. **Source:** Kurien and Achari, 1988.

(c) Enhanced Disparities Between Workers and Owners

Overfishing has not only reduced the income levels of the working fishermen, but it has also increased the level of disparity between them and the non-worker owners of mechanized boats. From a small share of 12 per cent of the total value of output of the sector in 1969, the latter's slice of the fish-pie increased to 27 per cent in the boom period of 1974. Thereafter, with the phase of overfishing setting in, their share increased further, reaching 43 per cent by 1982 (see Table 6).

Table 6		
Distribution of Value of Output of Fish between Workers and Owners (in millions of rupees)		
Year	Workers*	Owners of Mechanized Boats
1969	144 (88)	19 (12)
1974	392 (73)	143 (27)
1982	428 (57)	314 (43)

* Includes all artisanal fishermen (workers and worker-owners) and workers on mechanized boats. Figures in brackets are the shares. **Source:** Kurien and Achari, 1988.

With the increase in the number of mechanized boats between 1969 and 1982, the number of owners has increased. This partly explains the increase in their shares. However, assessments of profitability (mentioned in section above: Government of India, 1971; Government of Kerala, 1979; Kurien and Willmann, 1982) indicate that until 1980-1981 the **net** returns on investment on mechanized boats on the **average** were positive.

(d) Less Fish for the Local Consumers

Fish was at one time considered to be the poor person's protein in Kerala. No more. Viewed from the perspective of the avid fish-eating population of the state, **more** investments for fisheries development have yielded less fish for domestic consumption. The availability and quality of fish sold in the markets have deteriorated, and the retail prices have increased faster than the general cost of other food items (Kurien, 1984). There is evidence to indicate that

middle and higher income households are shifting to more readily available and cheaper sources of protein. The poorer consumers do not exhibit easy changes in diet patterns, and are therefore the ones most affected by this scarcity of fish. Per capita availability of locally consumed fish has decreased from around 19 kilograms in 1971-1972 to around 9 kilograms in 1981-1982 (Kurien, 1985).

2. Responses of the Commoners

Having provided a backdrop about the coastal commons and the various mutually reinforcing factors which led to a resource crisis within it, and the impact thereof, we will in this part of the paper focus attention on the collective macro- and mezzo-level responses and the individual micro-level actions of the commoners – the fisherfolk – to the situation they confronted.

Two factors must be stressed. Firstly, these responses are by no means “anarchic” or “autonomous” reactions. They are born out of the evolving socio-economic and techno-ecological forces rooted in the very dynamics of the development of the fish economy of the state. Secondly, it is our opinion that, since the resource crisis itself was brought about by a multiplicity of factors, the responses to it will be equally disparate, and will not always move unidirectionally toward resolving it.

The collective responses were marked by the conscious and participatory efforts of the fisherfolk to influence the state to initiate measures to co-manage the commons in ways which would ensure its sustainability. This was, therefore, essentially a political process through which the fishing community hoped to also achieve steps which would result in greater socio-economic equity. To appreciate the implications of this socio-ecological and political movement, it is necessary to digress a bit to describe the factors which laid the foundation for this new form of “class” unity of the fisherfolk.

(a) The Making of a Popular Movement

Fisherfolk in Kerala state, as in every other part of India, have been at the margins of society – geographically, economically, socio-culturally and politically.⁵ The nature of their occupation, which takes the men out to sea and back to the fringes of the land, thus curtailing social interaction, is one of the predominant reasons for this marginalization. Women in some of the communities are involved in taking fish to the market and they undergo a greater socialization. The effects of this rarely percolate into the male-dominated family life. Added to this, the archaic value systems propagated by organized, male-dominated religion – particularly Roman Catholicism and Islam – curb any tendencies toward forms of organizational unity outside time-honoured, conventional, socio-religious expressions. Economic domination, particularly by merchants and middlemen, often from within the community and having considerable influence over organized religious affairs, curtail any form of new economic formation.

The above factors, working in combination, have given credibility to the perception held by political parties in the state that fishing communities are “vote banks” to be wooed only at election time. The conservative parties, who generally get the open backing of organized religious forces and the economically powerful, have been able to rest assured of the fishing community votes, come what may. Consequently they have considered it unnecessary and even unwise to work among the actual fishermen – strictly preferring to approach them on all counts through their religious leaders or the influential persons in their communities (generally non-fishermen and often merchants). The more progressive political parties with

⁵ In the caste hierarchy of Indian society, fishing communities figured way down the list – though not the lowest. Despite the conversion of many of them to Roman Catholicism and Islam in the fourteenth and fifteenth centuries, their socio-cultural status in society at large has remained low.

secular policies and working class concerns have considered traditional artisanal fishworkers an “unstrategic” group whose votes in any case they could hardly hope to get.

It was in this context, in what seemed like a socially isolated community, that a new genre of social activism began in the mid-1960s. Social activists, predominantly from Christian backgrounds and often even with the support of church-related social action organizations, began systematic work among the fishing communities. These interventions gave equal emphasis to development work and awareness building. They raised the need for more social justice and stressed the importance of popular participation by youth and the labouring sections of the fishing communities in the economic and socio-religious realms. Successful fisherworker’s co-operatives, women’s clubs, youth clubs and a variety of people’s organizations were the result. These new ventures at no stage acquired the proportion of a mass movement, but by the mid-1970s they were widely scattered along the coast of Kerala and remained as “critical and creative irritants” on the periphery of broad traditional socio-religious structures.

Having interacted closely with the economic activities of fishing communities – through efforts at providing credit, introducing intermediate technology, facilitating organized fish marketing and forming credit unions among women fish vendors, among other activities – these social activists came to have an intimate working knowledge of the complexities of fishing, the dynamics of the market and the nature of the socio-economic exploitation experienced by the labouring sections of the community. However, all through their involvements, the “bounty of the sea” was taken for granted. The basic problems of fisherfolk were seen to stem from the “sharks on land” rather than the lack of fish at sea. It was a problem of getting a fair price for fish – not getting fish.

Activist-researchers in Kerala state had, by the end of 1977, made extensive analyses of the marginalization process of the majority of the labouring fishermen. All the data and other objective facts pointed to the disturbing conclusion that fisheries development policies had become grossly divorced from fisherfolk development priorities.

The events in the neighbouring states of Goa and Tamilnadu, where traditional fishermen battled with trawlers that mercilessly rammed into their little crafts and cut their nets, added to this perception. In these states, fishermen, with the active animation of non-party social activists, confronted what they perceived as an infringement of their traditional rights at sea by trawlers owned by non-fishermen. They adopted both militant and non-violent means to do this. The ingress of blatant capitalism into the precincts of traditional fishing via the sea became a reality.

Without much delay, the spread effects of the confrontations-at-sea in Goa and Tamilnadu reached Kerala. Its primary effect was to create a new sense of unity among fishermen over the common problem of increasing ingress of trawlers into the coastal waters, and the consequent decline in their catches. By the end of the decade of the 1970s the first steps had been initiated toward the formation of an organization to articulate the fisherfolk’s protest and channel the spreading unrest. The vast majority of the artisanal fishermen were either owner-operators of small fishing units, or employed as share workers on them. The economic and social distances between them were not very large. An association which could bring them together to pressure the state “from below” to protect their livelihood was sought. After considerable discussion such an association finally took the form of an independent trade union. This was an anomaly in the political context of Kerala state, where trade unions were nearly always associated with political parties.

The primary initiative in forming the union was taken by the small groups of fisherfolk and social activists (mentioned above), working along the coastline of Kerala. This new

organization was called the *Kerala Swatantra Malsya Thozhilali Federation* (KSMTF) – Kerala Independent Fishworkers Federation.⁶ While the social activists were predominantly Christians, the fisherfolk who rallied around them were from among the Christian, Hindu and Muslim fishing communities. This situation created concern in the established religious circles – particularly the Catholic church. They considered such a secular movement, in which clergy and nuns played a vital animation role, to be too “radical”.

(b) Collective Action – Macro-Responses to Safeguard the Commons

In 1981, the KSMTF spearheaded the movement of artisanal fisherfolk demanding measures to regulate the anarchic and destructive fishing of trawlers in coastal waters. Their primary demand was for a trawl ban during the monsoon months of June, July and August, arguing that it was during this time that many of the important species of fish spawn in the coastal waters. A monsoon trawl ban was highlighted as an essential management measure to prevent **further** marine resource depletion in the coastal waters. A second demand was for effective enforcement of a trawler-free coastal fishing zone reserved exclusively for artisanal fishermen operating non-mechanized craft and for a total ban of purse-seiners from Kerala’s waters. Subsidiary demands for greater social welfare measures were also included.

Fisherfolk predominantly from the southern and central districts of the state joined the KSMTF’s multi-strategy struggles. A combination of *nirahara satyagrahas* (fasts), *rasta rokos* (road blocking) and massive processions before the government secretariat in Trivandrum, the capital city, were the tactics used to get public attention and action from the government. The impressive turnout of women of the community in the forefront of the processions and the militant, yet disciplined, character of the demonstrations, impressed the press and the police – the latter having always been cautious with fisherfolk whom they had always considered to be “volatile, unruly and easily provoked”.

The awakening and social upheaval of the coastal areas around issues of occupational concern, and the fact that an independent trade union had championed this cause, caught many political parties in the state on the wrong boat. The “vote bank” concept was called into question. In a geographically elongated state like Kerala, with numerous coastal constituencies, an unpredictable fisherfolk electorate was a condition no political party could risk – irrespective of the colour of their flag and the content of their policies.

All the major political parties, without exception, created new fisherfolk organizations and joined the fray to be able to claim that they also were part of this historic awakening. The left parties had earlier been involved with fisherfolk, particularly in the northern and central districts of Kerala, but hardly on issues of the nature with which they now found themselves confronted. But these earlier associations paid off and they were also able to muster considerable support from fisherfolk in these areas. This, however, did not mean that they could steal the initiative from the KSMTF.

The government in power at that time was a mixed coalition of political parties – those representing the interests of the Muslim and Christian communities, and also some leftist parties which dominated the front. They were confronted with the dilemma of having to please the agitating fisherfolk and the powerful lobby of trawler and purse-seiner owners and the fish exporters. They enacted the Kerala Marine Fisheries Regulation Act which provided legal backing for the zoning of the coastal waters into areas reserved exclusively for artisanal fishermen using non-mechanized craft, and areas beyond this for trawlers and purse-seiners. The implementation of the Act was delayed and the government pleaded its inability to strictly enforce the law due to the lack of technical and financial resources. However, quick

⁶ Between 1979 and 1981, before it came to be called the KSMTF, the movement went through several changes of name, coverage and character which we do not mention here for want of space.

measures were taken to implement the welfare schemes – educational grants for children, accident insurance, more liberal credit, housing loans and the like.

The government also appointed an expert committee to look into that they considered the “scientific and technological issues and assess the socio-economic consequences of the fishery management demands (particularly the monsoon trawl ban) of the fishermen.” This committee included representatives from the scientific community, the state bureaucracy, the artisanal fishworker’s unions and the trawler/purse-seiner owners. The most reputed of the scientists on the committee failed to appear at meetings on the plea that the fishworker’s demands were “more political than scientific”. He left it to the bureaucrats to resolve the diametrically opposing positions of the fisherfolk and the trawler owners. Understandably the committee could not arrive at any consensus. Its proceedings were concluded with the representatives of the fishworkers’ organizations presenting a dissenting note to the chairman. A stalemate prevailed.

During the course of the 1981-1982 period of struggle, the church hierarchy became more concerned about the militant and confrontational approach adopted by the KSMTF. A major faction of the clergy which had recently become involved with the fisherfolk were apprehensive about the “leftist” tendencies which they perceived in the slogans and the songs of the movement. They preferred that the focus be on the fisherfolk as a “community” rather than fishworkers as a “class”. Gradually the contradiction between the pro-church faction and the secularists became unmanageable. The conservative Christian faction within the KSMTF broke away to form another union which had the explicit backing of the Catholic church hierarchy and the conservative parties. They called the new union the *Akhila Kerala Swatantra Malsya Thozhiali Federation* (AKSMTF) – All-Kerala Independent Fishworkers Federation. The priests and nuns who continued to support the KSMTF were censured by the church.

Within a few months of this development, fresh elections were announced in the state since the then ruling alliance broke up. The manner of handling the fishworkers’ uprising was one of the significant issues of contention between the alliance members. The ensuing election campaign created a situation where the leadership of the KSMTF was pressed to take a political stand in favour of one of the two electoral “fronts” which were competing in the election. This created the first major contradiction for this “independent” movement functioning in a highly charged “party dominated” political context. The KSMTF leadership was in favour of campaigning openly for the new “front” led by the left parties because of the favourable stand they had adopted to the 1981 struggles.

After the elections, a new political alliance came to power. It was a conservative alliance with the Congress (I) (the party in power at the federal government of India) as the dominant party. However, the swing in the coastal votes toward the left did not go unnoticed. The ruling party realized the gravity of the situation and its future electoral implications. The importance which they accorded to the turmoil in the fishery sector can be gauged by the fact that for the first time in the history of the state the chief minister held the fisheries portfolio, which was considered until then to be a relatively minor responsibility.

The chief minister was determined to break the power of the KSMTF and the fisherfolk organizations of the left parties. He was able to co-opt AKSMTF and refused to have discussions with the KSMTF. He sought to neutralize the social upheaval by promises of an economic and technological package to be made available directly to individuals and groups of artisanal fishermen at the village level. This was also perceived to be an effective means of softening the militancy of the unions which opposed the government. The government set up a new fisheries co-operative federation to cater exclusively to the needs of the artisanal

fishermen, and began to actively promote the emerging trend among them to use outboard motors on their traditional crafts.

(c) Individual Responses – Enter the Outboard Motor

While the artisanal fisherfolk struggled at the state level for management and control of access to the coastal zone, at the level of their own fishing operations they began to be more open to new technological innovations. This was most evident in the central maritime districts of the state. The most important of these new innovations was the outboard motor (OBM) which, when used to propel their craft, would reduce the drudgery of their work and provide the flexibility to enable them to fish in deeper waters. The new, and more liberal post-1981 import policies of the Government of India (ruled by the Congress (I)) made OBMs from Japan easily available in the market. What started as a cautious experimentation with OBMs by individual fishermen soon acquired the tacit support of the new government in Kerala state.

The OBM resulted in a major reduction in the drudgery of fishing. Those who began to use the OBMs switched over from using a combination of oars and sails to a total dependence on the OBM for propulsion of their craft. The OBM was perceived as the artefact which could enhance the fishing range beyond the overfished coastal waters.

Initially, fishermen using motors were seen to harvest more fish than those who continued to operate the non-motorized craft. Non-owner fishermen exhibited a definite preference for working on motorized units. Observing these changes, the fishermen who could mobilize the financial resources were spurred to opt for motors.

If the two desirable conditions of (a) reduction in the drudgery of fishing, and (b) fishing in deeper waters were to be **simultaneously** realized with the use of OBMs, then it implied a significant rise in operating costs **without** reduction in the uncertainty of catching fish due to the unfamiliarity with the deeper water fishing grounds. Confronted with this situation, fishermen were left with one option: to continue fishing in the overfished coastal waters for longer periods of time with the OBM-provided flexibility of using more active fishing gear – including mini-versions of trawl nets and purse-seine nets.

Between 1982 and 1984, the number of OBMs issued under government subsidy schemes alone reached 1,900. The economic impact of this quiet wave of change in the artisanal fishery sector did not engage the minds of the KSMTF leadership until they were confronted with strong demands from their central zone units for inclusion of “subsidies and greater quotas of fuel for OBMs” into the list of demands to the government, second only to the demand for the monsoon trawl ban.

This motorization trend, while it surfaced as a contradiction within the ranks of the KSMTF, did not deflect the union from its prime demand for the monsoon trawl ban. Predictions of an eroding base were belied by the overwhelming response to the KSMTF’s call, in 1984, for a renewal of its monsoon agitation.

(d) Back to Collective Action – The Historic 1984 Struggle

The primary demands of the KSMTF’s 1984 agitation were again for a total ban of trawling during the monsoon months and for stricter enforcement of the zoning provisions of the Kerala Marine Fisheries Regulation Act.

By 1984, the KSMTF had taken the form of an umbrella organization with well-knit, cadre-based and regionally decentralized autonomous units. The agitation call led to a total social upheaval of the coastal belt for well over two months. The predominantly non-violent agitation tactics were occasionally marred by violent encounters between irate fishworkers –

men and women – and the police. Many fishworkers and union activists were arrested. The agitation caught the attention of the national media. While serious editorials commented on both the social and the ecological aspects of the movement, it was the KSMTF-sponsored indefinite fast-until-death by a Hindu fisherman and a Catholic nun, in the northern coastal city of Calicut, which became the spotlight of media attention. For the press, sensationalizing the fast, and focusing on the role of liberation theology as a motivating force in the movement, overshadowed the fishery issues and the resource management questions sought to be raised by the KSMTF.

The Calicut fast was supplemented by massive processions of fishworkers and their supporters in key administrative cities and towns to focus attention on their demands. The main highway crossing the length of the state was blocked with canoes at several points on several days. The railway tracks were picketed and the road to the airport in the capital city of Trivandrum blocked. The spontaneity and massive response to the calls for various demonstrations were the hallmark of the agitation. The spirited involvement of the women and young children of the fishing community were crucial in getting the empathy of the public of Kerala for the issues involved. The KSMTF-organized fund raising campaigns among the public, focusing on the theme that fish consumers should support the cause of the artisanal fishworkers as they were the main suppliers of fish for local consumption.

The left parties which had fishworker's unions conducted "solidarity demonstrations", expressing their support for the KSMTF's demands, and tried to use their political clout as the opposition in the legislative assembly to demand a settlement of the issues. To their chagrin they realized that they could not muster the support from fisherfolk in the way accomplished by the KSMTF. The KSMTF, still recovering from the impact of the split in 1982, was also not keen to lose its identity by allying too closely with the left party unions. The compromise was to organize high profile "joint struggles" – particularly in the form of relay-fasts by the leaders of the various unions in front of the government legislature buildings in Trivandrum.

The government was firm about its stand vis-à-vis the agitation. It was unwilling to negotiate with the leaders and tried its best to break the agitation using strong-arm tactics. It also attempted to wean away sections of the fishworkers through the influences of religious leaders. These attempts met with limited success.

Due to very strong pressure from the trawler owner lobby and the prawn exporters, the government was unyielding on the major demand of the three-month monsoon ban. Its spokesmen constantly highlighted the phenomenal "costs" of such a step: a massive fall in the state's foreign exchange earning contribution and unemployment of trawler crew and processing plant workers.

The government warned against "militant" unionization and tried to placate groups of fishworkers which they perceived to be only "peripherally associated to the KSMTF" with direct financial assistance in the form of attractive subsidies and soft loans to buy OBMs and new fishing gear.

Seeing a virtual *cul de sac* to their agitation and the precarious condition of one of their activists who had been fasting for over 20 days, the KSMTF approached the government with a proposal for an experimental monsoon ban on trawling combined with participatory monitoring of the effect of the ban on the fishery resource.

The state government did not concede to consider this request. Instead, due to the political pressure from the opposition (left parties mainly), the government conceded to the demand of appointing an unbiased committee of experts to re-examine the management issues being raised and promised to implement the findings of the committee in full. The new three-man

committee was composed of an experienced fishery administrator and two leading fishery scientists. It was significant that the trio were from outside Kerala state. Though never stated explicitly, this was to ensure that the socio-economic and political forces in the fish economy of Kerala state would not bias their findings.

They travelled along the length of Kerala's coastline and met with all the sections and groups which had a stake in the fish economy. The committee submitted its findings in mid-1985. It cautioned the government about the impending crisis which could affect the coastal waters if the existing configuration of fishing assets and fishing effort continued to grow in an unregulated fashion (see Table 4 above). They did not approve the need for a monsoon trawling ban but favoured a drastic reduction of the fleet size of the trawlers to half the then current level. They recommended the use of more passive fishing techniques of the type used by artisanal fishermen, were in strong favour of a total ban on purse-seiners, cautioned the government and the artisanal fishermen about the massive motorization drive upon which they had embarked, and highlighted the need for active fishermen's participation in managing the coastal commons.

The main recommendations of this committee remained on paper only, and efforts by the KSMTF in 1985 and 1986 to commit the government to implement them were futile. In 1987 the government was voted out of power. The swing in the coastal votes against it played an important role in the rout. Six years after their first major agitation in 1981, with three changes of government during this period and a continued crisis in the fishery, the fishworker's organizations in general, and the KSMTF in particular, faced an impasse.

2.1 Manoeuvres in the Impasse

The marine fish harvest in Kerala continued to stagnate after 1985. The average of the harvest for 1986-1987 was only about the same as the 1981-1985 average (340,000 tons), with the important distinction that the artisanal fishermen using OBMs netted the largest share of the total harvest. The limited success achieved in altering the access rights to the coastal commons through their mass actions led fishermen to focus again on their individual responses to the situation by racing forward with motorization and adoption of new fishing gear. However, this period also witnessed some new group initiatives for rejuvenating the coastal commons.

(a) More Motorization and New Fishing Gear

The continued drive toward motorization made the average level of investments by artisanal fishermen in craft, gear and engines soar. In some districts the increase was almost 10 to 15-fold above the 1980-1981 levels. Ownership patterns in the fishery sector changed as well. In some areas the enhanced investment prompted collective ownership and high owner participation in fishing. In other areas the additional capital requirements were initially financed by local fish merchants, who perceived motorization and the new gear as a sure means of control over greater supplies of fish.

Motorization did result in fishing in deeper waters leading to an increase in physical productivity and harvesting of new species. It also led to the search for more appropriate craft designs which could be used with motors. These trends were very evident in Trivandrum and Quilon Districts.

In the central and northern maritime districts, motorization gave a big boost to the use of fine-meshed encircling nets called "ring seines" to harvest pelagic shoaling fish like oil sardines. These ring seines were nothing but smaller versions of the larger destructive purse-seine nets which the traditional fishermen had vehemently opposed.

The increased harvests often resulted in lower beach prices, since the fishworkers had little control over the marketing. This implied that gross earnings did not rise commensurate with productivity. The higher levels of recurring costs (particularly for fuel and repair of the engines), on the other hand, resulted in cash earnings of fishing units being greatly reduced. Despite all this, the evidence available suggests that the incomes of the non-owner workers increased in the initial years of motorization. However, this increase was rather short-lived since the need for rapid replacement of the imported engines (the economic lifetime of the engines was rated at two to three years), and their rising costs, drove the owners into debt traps. An immediate response was to alter the share patterns in favour of capital thus depressing the incomes of the workers.

The economic and the ecological impact of motorization and the introduction of the ring seine created new tensions **within** the traditional fishworker groups. In some areas the traditional fishermen – particularly the older among them – opposed the introduction of the ring seines. They argued that such nets would only accentuate the resource crisis in the long run, although the short-term results in terms of increased catches for a few lucky ones could not be denied.

Quite oblivious of the economic, ecological or social implications of the above, the government, through its fisheries development organization, actively promoted the earlier subsidy scheme for the purchase of outboard motors and introduced a new one for ring seines. This trend further accentuated the new tensions within traditional fishworker groups. In some areas traditional fishermen who continued to use traditional fishing gear violently attacked and burnt the ring seines.

Despite these intra-sector problems, the KSMTF claimed that the principal problem in the fisheries sector was still the ecosystem damage of the mechanized trawlers. They argued that this was at the root of the anarchic drive for motorization as well as the adoption of nets like ring seines and mini-trawls. The union leaders pointed out that these were only measures taken to beat the trawlers. They were of the opinion that once this principal problem was addressed with appropriate state intervention, the artisanal fishermen would automatically give up their destructive fishing methods.

In some of the KSMTF strong-holds where the trawler menace continued unabated, the newly acquired speed of the fishing craft as a result of motorization emboldened the fishermen to collectively apprehend trawlers and purse-seiners that violated the zoning regulations, thus forcing the government to take action under the KMFR Act. By taking on the self-appointed role of policing their exclusive-use coastal commons, guaranteed under the KMFR Act, they were bringing to bear on the state apparatus the usefulness and the inevitability of having fisherfolk participate more formally in managing the resource. However, neither the government nor the union wanted the entire responsibility for resource management.

(b) Group Initiatives at the Mezzo-Level – People's Artificial Reefs

A new group response was the revival of an old practice of creating artificial fish sanctuaries or artificial reefs on the sea floor of the coastal waters (Kurien, 1990). These moves were restricted to the Trivandrum district in the southern end of the state where the OBM drive was not coupled with the introduction of the ring seine or the mini-trawl. Reviving the artificial reef idea was also seen by fishworkers as a means of reviving and reinforcing their knowledge of the marine ecosystem. Between 1985 and 1988, the resurgence of the idea gave rise to a rapid spreading of a movement to create people's artificial reefs (PARs) totally funded and erected by the fishermen – at times with the active collaboration of social activists and marine scientists sympathetic to the cause. PARs become the symbols of the attempts of the fisherfolk at “greening their coastal commons.” Constructing PARs also provided an avenue for the creative use of their accumulated, transgenerational knowledge of the aquatic milieu and the behaviour of fish, which had been relegated with the coming of “efficient” fishing

gear which was without the ecological sophistication of traditional fishing methods. PARs also became appropriate physical structures for a fencing of their exclusive fishing zones against the incursion of trawlers. Finally, PARs, being largely group and village initiatives, also provided the “bridging initiative” between the macro attempts to manage the resource and the need to evolve lasting institutional forms at the community level which could provide the cultural, socio-economic and political empowerment necessary to sustain the participatory ethos of collective action at the macro-level.

The localized success of PARs in rejuvenating the coastal commons, and the higher and more valuable fish harvests obtained from around them, has created sufficient interest on the part of the government to consider sponsoring an artificial reef programme. The KSMTF has however opposed such a move for fear that such sponsorship will deprive PAR construction by the fisherfolk of its spontaneity, diversity and autonomy – three ingredients essential for their success and sustainability.

2.2 Trawling Bans – Economics and Politics

In 1988, the KSMTF and the other fishworker’s unions threatened to begin their pre-monsoon agitations. Responding to this situation, the government promulgated a partial ban. All the trawler operating centres in the state – except the largest one, Neendakara – were ordered closed for the months of July and August. The reason given for not closing Neendakara was that the heavy concentration of a marine prawn (*P. Stylifera*) in the inshore area during these months would perish if not harvested (mainly by the trawlers) resulting in loss of foreign exchange and employment.

The partial ban turned out to be ineffective. It could not prevent trawlers from the other centres operating from out of Neendakara. The boat owners also went to court charging the government with discriminatory treatment of trawlers located in different parts of the state, and got a delayed but favourable order. The artisanal fishworker’s unions were also unhappy with the situation. There were no significant ecological, economic or political gains from this management measure.

The continued conflict between fishermen using traditional fishing crafts and those using trawlers, as well as the fast emerging conflicts between traditional fishermen themselves (over the use of nets like ring seines), prompted the government to seriously re-examine the overall crisis in the fish economy. The government had before it the recommendations of the two earlier committees. Very few of these recommendations had been implemented. It was, however, deemed necessary to constitute a third expert committee to review the situation once again in the light of the recommendations of the earlier committees. This new committee was headed by a reputed marine biologist and secretary to government, and its terms of reference included: a re-examination of the question of the monsoon trawling ban; the effects of the unprecedented increase in the number of outboard engines and their power rating; and also the rapid increase in the use of gear like ring seines by the traditional fishermen. This expert committee submitted its report to the government in June 1989.

The government decided to immediately implement one of the recommendations made by the committee: a **total** monsoon trawling ban from mid-July to the end of August. The other recommendations, which included restrictions on the use of ring seines, limitations of the HP rating of OBMs, measures for protection of estuarine areas, and constitution of a study team to monitor the impact of the trawl ban, were kept in abeyance.

The surprise enforcement of the total ban resulted in bloody confrontations between the enforcement police and the boat owners at the major trawler landing centre, Neendakara. The boat owners took the matter to both the High Court and the Supreme Court. Both courts were unwilling to issue a stay order to the government’s decision. This legal ruling and the

unwavering stand of the government on the matter, despite the possible adverse political fallout, ensured that the ban was fully effective.

The ban did result in a considerable loss of employment for the workers in the processing industry. A fair number of the fishermen from the traditional fishing communities who worked as crew on the trawlers found opportunities to go fishing on the motorized boats operated from their home villages. A large number were, however, unemployed.

The total monsoon trawl ban was the most important fishery management decision made by any government in the country since independence. In October 1989, two months after the ban was lifted, very large pelagic fish landings were reported from all over the state.

It would be wrong to attribute this phenomenon **entirely** to the trawling ban, although both the ruling party politicians and the traditional fishworker's unions have done so. Much of the credit should go to the yet-to-be-well-understood nature-induced changes in the sea – for example, the effect of enhanced rains and the known cyclic fluctuations of pelagic stocks. However, the total ban of trawling, which resulted in the non-disturbance of the aquatic milieu during the monsoon months, has probably contributed significantly to the more pronounced shoreward movement of the pelagic fish shoals in pursuit of food which is found in abundance in the coastal waters areas cooled by the inflow from rivers swollen by the monsoon rains.

The ability of the motorized units – particularly those using ring seines – to harvest whole pelagic shoals also provides an important reason for the increased harvest **given** the favourable nature-induced conditions and the after-effects of the trawl ban mentioned above.

The increased landings depressed the shore prices, and the retail market prices also dropped drastically. Reminiscent of the 1950s, fresh oil sardines were sold as manure for coconut plantations! It is unlikely that this bumper harvest has had a commensurate positive effect on the incomes of fishermen. However, it certainly provided a temporary boost to the nutritional status of fish consumers – particularly the poorer among them.

This increased harvest therefore seems to have been brought about by a strange combination of factors: largely unpredictable nature-induced processes, strong political will leading to firm management measures and the use of ecologically sound over more efficient harvesting technology.

(a) Evaluating the 1989 Ban

In early 1990, the government constituted an inter-disciplinary study-team (recommended by the latest expert committee) to embark on a three-year study of the impact of monsoon trawling bans.

The first analysis of the fishery and the socio-economic impact of the 1989 ban were made by this team. The fish harvest in 1989 was reported to be a record 640,000 tons – a clear 170,000 tons above the 1988 level. However, the additional income effect of this to the fishermen was virtually nil because of the grossly depressed shore prices. There was a drop in the prawn catches of the trawler fleet in 1989, but the larger fraction of this decline was during the **non-monsoon** period! This highlighted the need for both the fisherfolk and the state to shift emphasis from the narrow focus of a monsoon trawl ban to the management and revival of the resources of the coastal commons as a whole.

In May 1990, the annual state convention of the KSMTF met to evaluate its activities and plan its future course of action. The sessions were marked by elation over the Federation's decade of struggles which were the prime mover in the government's decision for a total ban

of monsoon trawling in 1989. There was considerable soul-searching over the problems being confronted by the members due to their hasty and across-the-board adoption of motorization and new super-efficient fishing gear. The moral basis of demanding a trawl ban when many of them were now using equally destructive fishing gear came in for sharp internal criticism.

(b) The 1990 Trawl Ban Fiasco

The monsoon rains set in by early June 1990 and all eyes in the fish economy were focused on the government. The success of the 1989 ban, and the credit which the government took for implementing this, led the fisherfolk, the trawler owners and the fishery bureaucracy to assume that a trawl ban in the monsoon of 1990 was a foregone conclusion. Only the date of commencement was to be decided.

There were rumours that the newly elected National Front ruling the government of India, which was facing a tight foreign exchange situation, was exerting pressure on the state government not to enforce a ban due to its impact on net foreign exchange earnings. As though to confirm the rumours, the Marine Products Export Development Authority (MPEDA) – a government of India organization for promoting marine exports and dominated by private exporters – announced that it was not in favour of management measures like monsoon trawl bans because of the phenomenal loss of foreign exchange which it entailed. They attempted to prevail upon the state government not to impose a trawl ban in 1990, stating that the loss of foreign exchange due to the 1989 ban was about 300 million rupees.

Meanwhile, a reputed research organization in the state, using the data provided by the MPEDA, estimated that the actual loss of foreign exchange was at most 60 million rupees. It was also pointed out that this loss was in large part due to the fall in international prices and **not** primarily due to the loss of production due to the trawl ban.

The KSMTF activists obtained this research document and decided to *gherao* (encircle) the MPEDA headquarters in Cochin, the business capital of Kerala state, to make their protest known over the falsification of data. They argued that, by providing false information, the MPEDA was attempting to indirectly defame the artisanal fishermen's movement as working against the larger interests of the country.

With no announcement of the trawl ban even after mid-June 1990, the fisherfolk became restive. The KSMTF sought to pressure the government. Its president commenced a *nirahara sathyagraha* at the gate of the government secretariat in Trivandrum. The fishworkers' unions of the ruling left parties and the conservative opposition parties held separate rallies demanding the ban announcement.

With the pressure on there was hectic activity. The boat owners' association and the representatives of the export processors met the fisheries minister to put forward their positions on certain trawl ban-related matters. The boat owners argued that while they could agree to a short trawl ban in the coastal waters, permission to fish in the deeper waters should be guaranteed. In other words, they were seeking the right of "innocent passage" through the coastal waters even during the time of the ban. The export processors on the other hand were seeking a "write-off" on the dues they had to pay to a government welfare fund for fishermen.

On 28 June 1990 the government announced the monsoon trawl ban just as the KSMTF was planning to step up its agitation. However, unlike earlier years it did not specify the duration of the ban. This move was viewed with suspicion by the KSMTF. They had got information that some "deal" had been struck between the boat owners' representatives and a minister in one of the ruling parties who had close links with the marine export lobby.

The government issued two orders to bring the 1990 ban into effect. The first related to the rationale for the monsoon trawl ban which prohibited trawlers from fishing in the coastal commons. The second pertained to the technical specifications required for trawlers which intended to fish in the deeper waters beyond the prohibited coastal commons.⁷

The boat owners' association took the government to court on this second order. They stated that their boats, though not meeting the specifications of the order, could in fact fish for prawns in deeper waters and in fact always did so. By implication they claimed that the second order was a curb on their fundamental rights to pursue employment. The KSMTF joined the litigation by becoming party to the government's stand. After the initial hearings, the judge constituted a legal commission which was empowered to make a random selection of trawlers provided by the boat owners and actually go out to fish in the sea beyond the limits of the coastal commons to ascertain the validity of the boat owners' claims. The court instructed the government, the police and the appropriate fishery technology institute to make the necessary security and technical arrangements to ensure that the commission could undertake its task objectively. The court also permitted a representative of the government and the KSMTF (since they were party to the litigation) to send a representative on the voyage.

The whole process of the experiment was tension filled. The selected trawlers sailed out to sea. The commission members and the others accredited to the experiment, along with the police, followed on a larger vessel. On crossing the area of the coastal commons (as defined by the KMFR Act) the larger fishery survey vessel was awaiting them. At the appropriate signal the trawlers released their trawl nets and began to fish. On hauling in the net it was found that fish were caught but that there were no prawns. The commission members (the lawyers) gave their report to the judge. After a final hearing the judge pronounced his verdict. He stated that he was sufficiently convinced that the plea of the boat owners was tenable and suggested that the government should reconsider its stand on the second order on the grounds that the technical specifications stipulated by it seemed too stringent.

The prawn exporters chose the trawl ban period to pressure the government over their claims on the payments to the fishermen's welfare fund. The exporters argued that the turnover tax slapped on them was too high, and would even threaten their very survival, on top of the fact that during the trawl ban they were starved of raw material supplies. Moreover, they argued, since no share of the contribution to the funds were being utilized for the welfare of the processing industry workers they saw no valid reason to continue contributing to it. The fisheries minister refused to yield to this pressure since the fishermen's welfare fund was a major source of funds for "politically important" social security payments to artisanal fishermen promised by his government. The KSMTF and the fishworkers' unions of the left parties openly supported the government on this stand.

Negotiations with the exporters failed, and they reacted by closing down their processing plants. They refused to buy prawns from the artisanal fishermen who were, at the time of the ban, netting bumper harvests of prawns unhampered by the trawler operations.

The economic boycott caused a crash of prawn prices. As with oil sardines in 1989, prawns suddenly became available in the local markets at rock-bottom prices. Urban consumers, who have always had an affinity for prawns, but never the purchasing power to buy them at export rates, were suddenly confronted with the prospect of a culinary bonanza at affordable prices.

⁷ This second order gave specifications which very few of the trawlers in the state possessed. The order would thus prevent trawlers used in the coastal commons setting to sea claiming to be only "steaming through" to deeper waters. As the state's marine regulation enforcement machinery was weak, this was a sure means to ensure fool-proof enforcement of the total trawl ban.

The boycott exposed the total incapability of the government-sponsored fishermen's co-operative federation to intervene in the market. Equally importantly, it made clear to the KSMTF that their decade-old strategy of struggle for conserving resources without a parallel strategy to ensure that their members are assured a fair price for the produce of their labour could be counterproductive. The credibility of the government and the morale of the fisherfolk were at their lowest ebb.

The court verdict mentioned earlier came at this critical juncture. In less than 24 hours of receiving the news, the government performed what the KSMTF considered to be an act of total betrayal of the artisanal fisherfolk. It withdrew not only the second order **but also** the first order which related to the monsoon ban, although this was neither challenged by the boat owners nor received any adverse remark by the court. In fact, even after the monsoon ban was thus prematurely lifted after a mere 21 days, very few trawlers went fishing. This was partly due to the adverse weather conditions, but more importantly to the fact that a sizeable number of them had pulled up their trawlers onto dry docks for maintenance jobs hardly expecting such a "bonus" decision favouring the capitalist class from a left government!

The decision of the government caught all the fisherfolk by surprise. The fishermen's union of the leading left party in the government was holding a rally commending the government for taking the bold step to introduce the trawl ban for a second year when they were informed that the ban had been lifted! The official justification given for the lifting of the ban was that an inverse correlation was noted between the number of ban days and the increase in the fish harvest thereafter. In 1988, there was a near two-month (partial) ban and fish harvest for the year was up by over 80,000 tons of the 1987 level; in 1989 with a ban of 40 days, the fish harvest for the year was 160,000 tons above the 1988 level. By this logic, the ban of 21 days in 1990 was expected to result in an increase in fish harvest almost equal to the potential yield of the coastal commons itself! Such perverse logic was an insult to the intelligence of the average citizen of the state, and the **real** motives for the lifting of the ban became the subject of debate in the corridors of power along the coast. It became apparent that when the main left party in the government had to choose between remaining in power with the support of its allies and being committed to management measures which would ensure the sustainability of the commons, they chose the former.

2.3 Toward Resolving the Crisis?

It would be a truism to state that the fish economy of Kerala is in the throes of a crisis. From our analysis it is also clear that, in the long run, it is the coastal commons **and** the working fishermen, rather than the capitalists, that will be most affected.

The primary reason for this is that the capitalists can easily move out of the fishery while the fishermen are more or less tied to it, owing to a lack of alternative economic opportunities. For the fishworkers, their future lies in the sea and its common resources. For capitalists, given their short-term perspective, and under the given conditions of investment, the ratio of profits from indiscriminate harvesting of the commons to the profits from regulated and sustainable harvesting are large. For them it actually pays to bring ruin to the commons!

It is such conflicting motivations and actions which provide the basis for the unequal bargaining power of the two classes and the rationale for the state to regulate the coastal marine waters. An action plan to resolve it is indeed the priority of the day. The objective of any programme of action must be two-fold: (a) to revive the sustainability of the coastal commons and (b) ensure that it provides a basis for a decent livelihood and inexpensive food for as large a population as is possible. The achievement of these objectives demands a policy approach in which development and management of the marine resources and the fish economy are seen as two sides of the same coin.

The scale and type of harvesting technology should be in consonance with the known biological and ecological parameters of the resource. Small-scale fishing crafts using multiple sources of energy, selective fishing gear, and operations from decentralized centres along the total length of the coastline should be encouraged. Economically efficient but ecologically destructive fishing artefacts should be strictly controlled irrespective of the user.

The ownership of harvesting technology – fishing craft and gear – should be restricted exclusively to those who are willing to fish. An aquarian reform of sorts to ensure this needs to be enacted by the state. Such a community of workers and working-owners should be entrusted with the collective rights and responsibility of managing the coastal commons within the jurisdiction of their decentralized operations at the micro and mezzo levels.

Conscious efforts to enhance the biological productivity of the coastal waters should be given adequate encouragement. Attempts such as the collective creation and establishment of artificial reefs in coastal waters are good examples of this.

Moving to the hitherto unfished deeper waters is an essential step to reduce the pressure on the coastal commons. This is an arena for diverting some of the excess investments presently in the coastal waters. Making fresh investments in the deep sea should be preceded by thorough resource estimation surveys and economic viability studies. These need not be excessively preoccupied with export potentials. Subsidies to those who move out to these waters may be more economically and socially justifiable.

The above options with regard to conserving and enhancing the fishery resource, the choice, ownership and operation of the technology, as well as the social institutions for management of the resource provide the basic framework for a fresh policy approach. This will be required to pull Kerala's fish economy out of its ecological crisis and provide a sustainable future for the fishery resources in the coastal commons and the commoners.

At the beginning of a new decade the artisanal fisherfolk of Kerala stand poised with a decade of struggle behind them and an uncertain future ahead. In the words of an old fisherman, "...our only hope lies in the sea, for we know that it belongs to the dead, the living and those yet to be born". This is an important article of faith for all the fisherfolk of Kerala, particularly at this juncture. It is also a pithy understanding of sustainable development.

To give substance to this article of faith calls for genuine, participatory collective and individual responses that can be woven together to form the fabric of a new development process. It also implies a commitment to a programme of action at the macro, mezzo and micro levels which will ensure sustainable participation to create a development process which is participatory.

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