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**CONTRADICTIONS AND CONSTRAINTS IN FISHERIES
DEVELOPMENT: Capital, Artisanal Workers
and Shrinking Resources in Kerala**

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1. Introduction

This paper is concerned with the impacts of technological modernisation and global incorporation upon the artisanal fish economy of Kerala, India.* These processes of capitalist penetration were set into motion by a combination of private capitalist, international donor and state interventions promoting the development of a highly productive seafood export industry. The modernisation drive has resulted in serious problems of overfishing and depletion of the fish resources, which in turn meant loss of productivity and incomes for the majority of fishworkers and loss of local access to an important protein source.

The paper's specific interest is firstly, in the responses from below which these impacts have generated, notably from the side of the artisanal fishworkers. Does their mobilisation and organisation enable them to effectively confront the processes in which they are caught, as has often been advanced? It will be shown that due to conjunctural and above all structural factors their collective actions, however important in other respects they were, did not succeed in changing the basic dynamics of the transformation process. A second interest concerns the long term viability of certain alternative development visions in the field of fisheries which have been put forward by different non-government circles within as well as outside Kerala. The argument advanced is that these perspectives are essentially reductionist and tend to underestimate the pervasive reorientation of individual survival strategies and priorities following the fish industry's transformation.

To prepare the stage for the analysis a brief review of some aspects of

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the fisheries resource base will be useful. In much of the literature on fisheries development the natural resources of the sea are conceptualised as 'common property' or 'open-access' resources. These terms, used as synonymous, imply that the marine resources by their nature are not subject to exclusive property rights and thus freely accessible. This makes fishing highly competitive and the basic assets upon which it relies extremely vulnerable to overfishing and subsequent depletion. As the early resource economist Scott Gordon put it 'everybody's property is nobody's property. Wealth that is free for all is valued by none because he who is foolhardy enough to wait for its proper time of use will only find that it has been taken by another' (1954:135). Thus a chance to make profits will cause existing fishermen to increase their efforts and new fishermen to enter until the net economic yield is dissipated (op. cit.:131-132; also Panayotou 1982:28).

The above theoretical perspective has been criticised as historically faulty (Emmerson 1980, Bavinck 1984, McCay et al. 1987). It neglects, for example, the existence of customary resource use institutions as well as recent developments limiting the open-access nature of the sea, such as the establishment of the 200-mile Exclusive Economic Zones. In other words, open access in the sense of unrestricted entry and use may still be circumscribed, while as a resource exploitation system it has to be clearly distinguished from common property. The latter refers to situations in which there are specified legal or customary rights of joint use over a particular territory which are 'conclusive to a defined group of people' (McCay 1987:8; cf. Runge 1986). Traditionally, for example, caste, ethnic origin, kinship and/or village membership were common means of exclusion. Such entry and tenure regulations (which besides collective or communal ownership' might also involve private property rights) have important resource management functions.

However, customary systems in this respect tend to break down and be converted into open-access exploitation under the impact of technological modernisation and incorporation processes. As a consequence, the unrestricted competition for product and its destructive aftermath as exposed

by Scott Gordon, may well be brought about. It has to be noted in this connection that in tropical waters the multispecies nature of the fish resources (i.e. large numbers of species occurring in small quantities and in complex interactions) may cause problems of resource competition between different fisheries even if they do not aim for the same fish species (Panayotou 1982:9, 25).

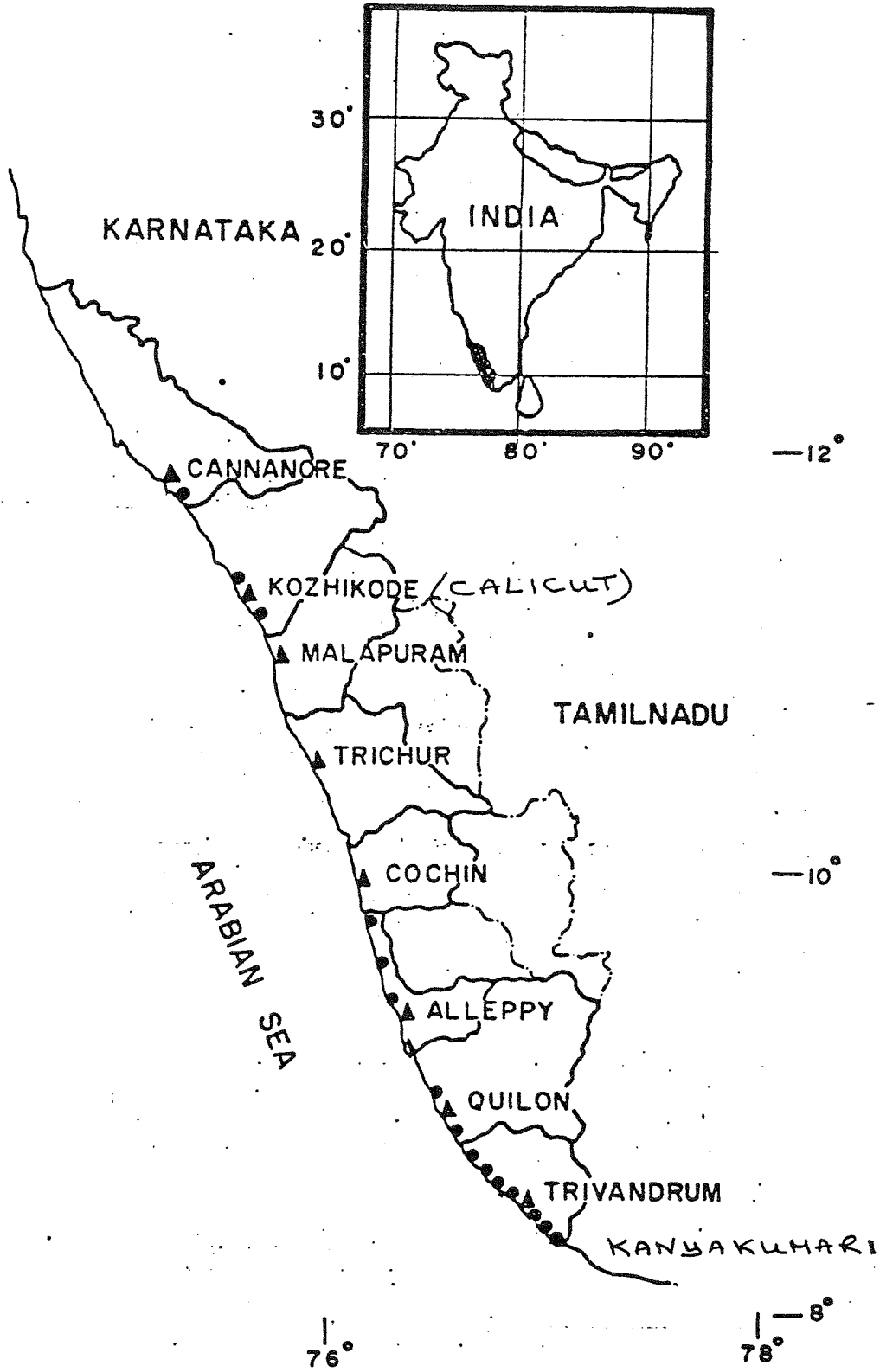
The open-access problematic unavoidably leads to the conclusion that fisheries development is difficult to realise without effective fisheries management regulating the use of the resources. Key questions in the latter respect are, however, management by whom and for whose benefit and loss (Emmerson 1980:25)? In the final part of the paper the manner in which these concerns have been addressed in alternative development strategies will be further considered.

The paper is organised as follows. Section 2 gives a background to the Kerala fish economy with special attention to the nature of artisanal fisheries and its fishing communities. Section 2 discusses the specific forms and impacts of capitalist penetration within fisheries, while section 4 reviews and assesses the mobilisation strategies for empowering the artisanal fishworkers vis-a-vis the newly emerged forces within the fishing industry. Finally, section 5 briefly reviews some alternative development propositions for fisheries management and development and considers their (long term) viability within the Kerala context.

2. The Fish Economy in Kerala

Kerala is one of the principal maritime states of India. Situated along India's south west coast (see map) it has a coastline of 590 km and its marine fishing grounds have for long been known for their diversity of fish stocks and high production potential.¹ Its sea food export history dates back many centuries. The Kerala coastal area traded dried fish within the South Asian region and during colonial times fish oil was exported to

MAP OF KERALA



Britain (Iyengar 1985). Although Kerala has only 10% of India's coastline and 7% of its continental shelf it accounted in the early 1980s for about 24% of the all India marine fish production and well over 40% of the country's sea food export earnings (Babu Paul 1982).

The contribution of fisheries to the total export earnings of Kerala itself was at that time over 20% (op. cit.). The importance of the fishing industry for the economy of the state lies not only in its contribution to foreign exchange earnings, however. Fish provides for about three fourths of the animal protein intake of the state's population, and for the poor it is the main source of animal protein. Besides, the industry constitutes a source of livelihood on which some 800,000 people depend, i.e. over 3% of the state's aggregate population of 25 million (op. cit.). The majority of these people, viz. about 602,500 according to 1979 census data, depend upon marine fishing (Government of Kerala 1982). They live in some 250 densely populated fishing villages spread along the sea coast. Besides, there is a much smaller inland fishery sector supporting a fishermen population of about 176,400 which, however, is outside the scope of this paper.

The marine fisheries sector provided in 1979 employment to around 122,000 active fishermen². A similar number of people was estimated to be employed in the related activities of boat-building, net-making, processing and marketing. In the early 1980s the average annual growth rate of the fishermen labour force was believed to be at least 2% (SIFFS 1984; Kurien 1985).

As deep sea fishing has not yet developed, all fishing efforts are taking place within the inshore waters (0-50 m.). This zone constitutes only about 33% of Kerala's continental shelf (12,570 sq. km.) but it comprises 50% of its aggregate production potential (Thankappan Achari undated, 1987). The pressure of fishermen on these fishing grounds is very high. Figures for 1980 indicate a number of 1043 active fishermen per 100 km² inshore sea, almost four times more than the national average (269 fishermen per 100 km²). Accordingly, in Kerala the available productive area per fisherman in 1980 was only 10 ha. as against a national average of 37 ha.

(Thankappan Achari 1986^b:5). Considering the annual increase of the fishermen labour force together with the lack of alternative employment opportunities in other sectors of the economy, these figures seem quite disturbing already. The situation is further aggravated, however, by the decline in total marine fish landings since 1974. Between 1974 and 1982 the production volume dropped from 420,000 tonnes to 325,000 tonnes (Kurien 1985, table 3). Whereas in the years 1971-75 the average annual catch was 406,065 tonnes, in 1976-80 it dropped to an average volume of 331,895 tonnes and also in 1981-85 the yearly average fish landing was only 355,914 tonnes (Thankappan Achari 1986^a).

The cause of this production decline originates from the earlier mentioned fisheries development process set into motion in the mid 1950s. It involved the uncontrolled introduction of modern capital intensive technology coupled with the establishment of a sea-food export industry. In the field of production this led, among other things, to rapid depletion of the marine fish resources in the inshore sea. As these developments and their profound impact on the existing artisanal fish economy and its workers will be the main subject of discussion in the following sections this matter will not be further addressed here.

The marine fisheries industry through the above indicated capitalist penetration got an apparent dualist character. Beside the centuries old artisanal fishery sector a fully mechanised export oriented sector came about. In 1979-80 the artisanal sector included some 106,600 fishermen and more than 34,000 fishing crafts and procured around 62% of the annual fish landing; the mechanised sector had about 17,500 workers and 3,000 crafts (Kurien 1985). It may be concluded that the artisanal sector still forms the base of Kerala's marine fish economy notwithstanding the increased pressures under which its workers have been operating since the 1960s. This assessment is the more true if not only production results as such but also contributions in respect of employment and domestic food supply are considered.

We will now have a closer look at this sector, which should provide us with a better background to the discussion in subsequent parts of the paper.

Our point of departure will be the fishing communities and the artisanal fishing industry as prevailing in the early 1960s. Many of the features described below are still prevalent, however.

2.1 The Nature of the Artisanal Fish Economy and Fishing Communities

Traditionally, fishing and fish vending were the exclusive occupations of specific low-ranking castes and the fisherfolk were a down-trodden and neglected grouping in the Kerala society. Their communities were notorious for their poverty and unhealthy living conditions. In the fishing villages population densities were extremely high (up to 6000 p/km²), and housing consisted mostly of thatched huts without any sanitary facilities.³ Demographically, the fishermen population distinguished itself from the general population by its high morbidity and low life expectancy rates as well as by its reverse sex ratio⁴. Due to the production conditions in artisanal fishing daily household incomes as a rule amounted to only small sums of money and moreover were highly irregular and fluctuating (Abraham 1985:247; also Platteau 1984).

Production conditions were characterised, firstly, by a labour intensive technology which restricted the operations of the fishermen to the fishing grounds near to the coast. This led to methods of fishing and to fabrication of boats and particularly fishing gear which were highly adapted to local fish harvest conditions and seasonal variations in them (Kurien & Willmann 1982). According to the variation in fishing opportunities different craft and gear combinations were used. Particularly the possession of a variety of fishing gear was common among the fishermen. Their operation was selectively geared towards catching specific species of fish as available in a particular period. In view of the nature of the fishery resource base and the vulnerability of tropical eco-systems to disruption, this ecological responsiveness was a very valuable feature of the artisanal mode of fishing.⁵ The depletion of the inshore fish resources was, however, also prevented by the low productivity of the technology and by the limits to entry into fishing posed by the caste system.

Besides low levels of productivity, the limited productive force development (oar- or wind-propelled wooden crafts, cotton nets, only natural harbour facilities without wave breakers, non-mechanised preservation techniques like salting and drying) implied a high degree of risk including economic risk and physical danger (Platteau 1984; also Scheepens 1987). Within fishing households these factors led to survival strategies which in respect of income generation relied to a significant extent upon the work of women besides that of men. In Southern Kerala (viz. the districts of Alleppy, Quilon and, in particular, Trivandrum) it induced a division of labour in which women specialised in fishing related activities such as preservation and trade, and in "on land" problems, while men specialised in fishing and "sea" problems. Another aspect of the survival strategies of fishing households was their reliance on credit.

The riskiness of the employment conditions, together with the dependence of the fishing communities upon exchange markets for covering their basic needs in the spheres of consumption and production, made access to reliable credit facilities a life necessity for fishermen households.⁶ This gave rise, firstly, to informal subsistence credit systems in the fishing villages which were interest free and catered for the immediate subsistence requirements of needy households (Abraham 1985). Besides, more costly types of credit systems associated with market interlinkages (or so-called interlocking markets) were found in many areas along the coast. They involved long-term credit arrangements between, on the one side, owner-employers or merchants and, on the other side, poorer fishermen. Loans were given against commitment of either future labour or future delivery of catches (Platteau 1984:77-79). Such interlinked transactions based on personal relationships for both sides had some risk-minimizing function. For the fishermen the reliability of the credit source tended to overrule its expensiveness. Particularly under monopoly-type of conditions these credit systems could be exploitative and thus increased the fishermen's poverty and dependency. In the field of marketing similar credit relations eventually developed between merchant-financiers and small fish distributors including fish-trading women (Kurien, 1984).

Within this general production setting the varying ecological conditions along the Kerala coast had caused a considerable variation in actual production structures. This in turn was reflected in the realm of distribution and in the socio-economic structures of the fishing communities. The ecologically determined pattern however, was complicated by socio-cultural variables of ethnicity, religion and maritime history, which thus created many local variations to the basic pattern. The latter may be characterised as follows: from North to South the sea becomes rougher and the surf stronger while the heterogeneity of fish species becomes larger and the scale at which fish of a certain species occurs smaller. Accordingly, towards the South boats and crews tended to be smaller, boats and fishing gear showed a larger variety and fishing units (boat-crew-gear combinations) tended to be increasingly flexible and changing instead of fixed. As a consequence the production structures of the central and northern coasts were more unequal and the fishing communities more stratified than those of the southern coast.⁷

Along the south coast in some of the areas of Southern Quilon and very much in Trivandrum and in the bordering Tamil Nadu district of Kanyakumari, a small wooden raft ("kattumaram") operated by a crew of two to three persons was predominant. It was individually owned as it was a relatively inexpensive craft.⁸ Kattumarams were used in different sizes (varying from 3 to 7 metres) with a wide assortment of fishing gear (hook and line as well as nets). This was needed to remain in operation as long as possible throughout the year. However, most fishermen could not afford all of it. Variations in individual resource capacities were addressed by operating flexible fishing units. Yet seasonal unemployment considerably depressed the annual incomes of the fishermen in the kattumaram area and made it one of the poorest along the Kerala coast.⁹

The small size of the fish landings per craft (5-50 kgs), the heterogeneity of the catches and the utilisation of many landing sites were conducive to the organisation of a small scale rather 'atomistic' and very labour intensive distribution system. Such a system matched very well the large, decentralised demand with generally low purchasing power arising from

the dense but scattered rural settlement patterns in the southern coastal area. Women headload vendors, and secondly, men cycleload vendors together handled more than 90% of the fish. The main clientele of the women vendors was located in the rural hinterlands of the fishing villages and that of the men cyclists was in the large somewhat more distant rural centres of the area (Kurien 1984:49). The transactions between producers and distributors were mediated by conducting auctions. Deficiencies in the auction procedures used to give the buyers ample scope for wronging the fishermen in respect of the prices for their catch. They often deferred their payment and cut down on the auction price after the auction was over, while also the formation of cartels was not prevented. Generally the resulting exploitation was not excessive, however.

From Trivandrum northwards different types of wooden canoes of increasingly larger sizes became prevalent, notably the plank canoe (7 to 15 metres long) and the dugout canoe (the smallest version being 4 to 5 metres and the largest one up to 15 metres long). In Quilon, with fish harvesting conditions not very different from those of Trivandrum, the smaller plank canoe was most common. The larger sized canoes of the central and northern coasts were mostly jointly owned in order to spread the investment risks. Joint ownership of more expensive gear was also common in these regions (Kurien & Willmann 1982:4-7).

With the predominance of the canoes, which had to be operated by relatively large crews (6 up to 15), fishing units became fixed combinations of workers and assets. Differences in asset distribution and the possibility of unequal production relations grew with the enlargement of scale of production. It should be noted in this connection, that such larger scale production conditions were not only entailed by the use of particular craft but also by the use of certain large nets such as shore seines (found along the entire Kerala coast including Trivandrum). Clear-cut interest polarisation between owners' and workers' strata was hampered, however, by the common participation of owners in the actual fishing work and the shared risk of life at sea, and by the sharing system of work remuneration prevailing in artisanal fisheries (Veracruz 1984). More important even was the

general instability in the asset positions of artisanal fishermen in contributing to this effect.

The more clear-cut class division in the coastal areas north of Trivandrum concerned that between the fishing communities and the larger local merchants/middlemen. 'Local merchants usually constitute the elite of the fishing villages, holding leading positions in the local power structure' (Platteau 1984:75). The seriousness of this division would depend, however, upon the scope and scale of operations of such merchants or middlemen. In Quilon fish harvesting conditions favoured the presence of large numbers of small scale distributors although larger merchants in control of interlocking markets and with accumulation capacity were present also. In the central and northern coastal areas catches consisted of only a few fish species and the size of the fish landing per craft was relatively large (100-300 kgs). This situation favoured the existence of distribution systems in which male merchants-middlemen with a monopsony position and lorry transport were more predominant (Kurien 1984). Through credit arrangements committing the future delivery of catches these merchants were in control of the poorer fishermen's produce.

In addition to economic forces the fishing communities were dominated by cultural-ideological forces, particularly caste and religion. As mentioned earlier, fishing and fish trade was traditionally a caste-based activity carrying a very low status. Education and, in former days, a change of religion were means through which one attempted to rise above one's caste background. At present about 67% of the population of the marine fishing villages is either Christian (37%) or Muslim (30%) (Government of Kerala 1982), whereas for Kerala as a whole the representation of these religions is only 38% (21% Christians and 17% Muslims) (Gulati 1981). Roughly, the northern part of the coast (extending from Trichur to Cannanore) is a mixed Hindu/Muslim area with a per district varying preponderance of the Hindu or Muslim fisherfolk. In the marine fishing villages of the four southern coastal districts the Christian notably Latin (or Roman) Catholic fishworkers population is preponderant,

constituting in Trivandrum almost 75% and in each of the other districts around 50% of the fishermen households (Government of Kerala 1982).

The Latin Catholic Church is very visibly present in the fishing communities of the southern coast and plays a dominant role in the lives and the life conditions of the Christian fishworker families.¹⁰ The Christian fishermen handed usually 5% of their daily fish catch over to the collector of church taxes. In the local political and administrative structure of the Christian villages church committees functioned as the 'gram sabha' (village council). The political relation between the Church and the local village elites (mostly educated men and well-to-do merchants) displayed itself by the latter's preponderance in these committees (PCO 1977; Murickan 1982).

At the macro-political level these political patterns, which in non-Christian fishing communities seemed to occur in a similar way, found expression in the voting behaviour of the fishing communities. Their vote went always to the right wing parties without the latter having to make any effort to obtain it. For the leftist parties, on the other hand, it seemed a waste of energy to try to gain a constituency among them. So up to the 1980s no political parties were particularly interested in mobilisation work among the fishing communities.

In conclusion, some further attention might be given to the sexual division of labour and related aspects of gender relations within the artisanal fish economy and fishing communities. Fishing was always exclusively a man's job. As for fish trading, in the Muslim communities along the northern coast this income-generating opportunity was also not open for women, who were barred from it by religious taboos. Along the central and southern coast, particularly in the districts of Trivandrum, Quilon and Alleppy, women used to take up fish trading in large numbers, however (Kurien 1984). Women undertook also other fishing-related activities such as fish salting and drying, net- and basket-making, or easily accessible jobs like shell collection, coir defibring and manual rope making (Gulati 1982). The returns from these activities were very poor. But women did such work out of economic necessity which in turn had to do with the low productivity and riskiness of the men's fishing job, together with the

nature of the exchange relations within the households. In the latter respect the common pattern was that the women would take care of the day-to-day household needs while the man's income may go to meet capital expenses, after deductions for his own needs (drinking and gambling). In cases where the man is a poor fishworker, he would even expect his wife to meet expenses for his personal needs (Nayak, personal communication).

Besides the exchange relations between men and women within the households still other aspects of gender relations determined women's work and living conditions. The most fundamental ones derived from the rules and mechanism governing women's sexuality and fertility. Among these were the principle of their early marriage, immediately thereafter the necessity to prove their fertility, and the necessity to produce many children and above all sons (Gulati 1983^a). Women were also held primarily responsible for child care and domestic work. Thus, particularly during the fertile years, frequent childbearing at short intervals, the nursing of many young children and the upkeep of a large household constituted constraints which seriously affected women's work conditions, outlook and opportunities in the sphere of production. As feminine conduct standards prevented them from using the bicycle, women fish vendors faced also a serious transport constraint. Besides, women fish vendors had to move around and function in male-dominated spaces and areas of activities (e.g. markets, roads particularly after nightfall) which exposed them to abuse and harassment by men from which they greatly suffered.

On the other hand, fish vending brought these women into contact with the wider society. The women fish vendors learned to know the economic and political forces within and outside the villages much better than the men of the fishing communities. However, women were completely barred from participation in the political, administrative and religious village institutions. Also within the context of the household and family their roles in respect of decision-making and control were circumscribed by the general acceptance of the norm of men's ultimate authority.

3. The Fish Economy in the Grip of 'Modernisation'

The previous section hinted already at the profound changes which manifested themselves in the fish economy of Kerala by the 1970s. These changes were induced by a combination of private capitalist and public interventions which, since the early 1960s, predominated the fisheries scenery in the state. The interventions were geared towards 'modernising' the fish economy in order to benefit from lucrative world market opportunities in the trade of fish, in particular prawns (Kurien 1985).

This modernisation drive happened to link up well with a national policy urging for large scale development of the fisheries industries. Although this policy dated already from the 1950s a new impetus was given to it by the foreign exchange shortage at the all-India level of the 1960s. The main goal promoted since, besides increase of the level of production and productivity in the fishery sector, was the exploration and development of its export potential. Promotion efforts involved the establishment of research, development and training institutions in fishery centres all over the country and the enlistment of international as well as country-to-country collaboration and advice (Kurien, 1978:1561). Furthermore, private entrepreneurship received powerful incentives to invest in export undertakings of the fisheries industries (Platteau, 1984). Besides Kerala, Karnataka, Tamil Nadu, Goa and several other states became involved in processes of large scale fisheries development since the 1960s. It is certainly true that the experiences in this field in the various states were not all identical. Yet the case of Kerala reviewed here may be considered as representative for the direction which developments took in quite a number of other states also.

The history of technological innovation and economic development in Kerala's fisheries industry did not start in the 1960s. Public and private development efforts in earlier periods had, however, a quite different orientation. They essentially focussed on strengthening the capacity of the existing resources and enlarging the facilities and industrial linkages of the artisanal fish economy. Thus fisheries development meant fishermen's

development as well as providing the poignant protein needs of the mass of the local rural and urban people (Kurien, 1985). This contrasts sharply with what in many corners came to be considered as fisheries development since the 1960s. The nature of that 'modernisation' process may rather be qualified as a de-industrialisation cum re-industrialisation process. This is so because instead of building upon existing crafts and industrial linkages the modernisation process tended to imply their (partial) erosion. Meanwhile it re-engaged part of the resources set free in this way for industrial endeavours of a totally different order. In those endeavours entirely new configurations of 'outside' actors and resources together with consumer demands from other continents came to play the key roles.

For a better understanding of this question, some further attention should be given to the underlying reasons for the whole course of affairs. One factor playing a dominant role was the luring export market for frozen prawns. The first explorations of the vast U.S. market for this product occurred in the mid-1950s by some of the bigger private merchant entrepreneurs in Kerala. This initiative soon linked up with another initiative of that period, namely the introduction of new fishing technology of superior efficiency for the catching and processing of shrimps (Kurien, 1985). The latter activity was undertaken within the framework of a bilateral Indo-Norwegian fisheries development project (INP) in Quilon which aimed at increasing the productive capacity of the fishery sector.¹¹ Having rejected the feasibility of improving upon the existing resources, experiments had been launched with new capital-intensive technologies.¹² Among these were fully mechanised fishing crafts and new types of fishing gear as well as preservation and transport technology, such as ice plants, freezing plants and insulated vans. However, the high costs of these technologies translated into high fish prices which overtaxed the purchasing power and effective demand of the local markets. The discovery of the promising international shrimp market was thus seized upon as a way out of that problem (Platteau, 1984). When also extremely rich untapped resources of prawns were found, the project concentrated henceforth on the introduction of efficient technologies for the prawn export industry. It seems that its

high-powered crafts and gear for bottom trawling in turn signified a welcome innovation for the merchant capitalist interests in the prawn industry.

When by the early 1960s Japan also began to show a strong demand for prawns the export drive really took off. The more powerful Kerala merchant capitalists from outside the artisanal fish economy kept the lead in this, at least during the 1960s. Furthermore, there was a large influx of public finances from 1961 onwards, indicating eager state interest in export-oriented fisheries development. Besides the tempting market perspectives and the ready availability of the necessary technology through the INP another factor inducing this was the earlier mentioned national interest in foreign exchange. Furthermore the political power of the merchant capitalist class in Kerala has no doubt also been of influence. State investment on fisheries development increased from Rs. 6 million in the period 1955-60 to Rs. 110 million in the 1960s and Rs. 209 million in the 1970s. In the latter periods by far the larger share of the investments went to programmes promoting the spread of the new technologies (particularly trawling boats) and the expansion of the export industry, e.g. in the 1960s this was 92-93%.

By 1969-70 the mechanised sector's share in the total fish landings (343,000 tonnes) was 12% (40,000 tonnes) representing a value of Rs. 41.5 million, i.e. 25% of the total value. It employed at that time about 7,800 workers representing 8% of the fishermen in the state (Kurien 1985: A-74, A-77 to A-79). It must be noted that during this period, and in fact up to the advent of purse-seining in 1979, mechanised fishing concerned demersal species only. It did not comprise new species which hitherto had not been landed by the artisanal crafts. The overlap in landings particularly concerned the fisheries along the southern part of Kerala's coastline (i.e. from Trivandrum up to about Cochin).

During the 1970s new powerful investors, namely multinational and national industrial enterprises, got involved in Kerala's seafood export industry. Meanwhile this industry dealt with, besides prawns, other products like cuttle-fish and squid. In this decade the mechanised fleet more than doubled amounting to something like 3,500 boats and employing

17,500 workers by 1979-80. Its share in the total fish landings increased to almost 40% (115,000 tonnes). The total export volume (procured by the mechanised and artisanal crafts) rose in the 1970s by 39% and the value of the exports by 296%, prawns being the most important contributor in both respects (ibid).

Before analysing other trends in fisheries development which loomed up during the 1970s, let us further consider the participation of the artisanal fishworkers in the prawn industry. Their experiences were not all that positive. Most of the newly introduced technologies for the catching, preservation and transport of fish were only accessible to people with considerable capital resources. The only exception was the application of ice for the preservation of fish, which considerably benefitted the fishermen as well as the headload and cycleload vendors. As for the mechanised boats, even if the initial expense was heavily state subsidised their maintenance costs appeared to be untenable for most of the artisanal fishermen (Kurien, 1978). The majority of them did not get even the chance to test this out, however, notwithstanding the existence of government loan schemes issuing mechanised boats to (groups of) fishermen to assist them in their access problems. The reason was that those services were linked to the organisation of state-sponsored cooperatives which were controlled by the larger, village-based fish merchants and moneylenders. In short, the 1400 government-provided mechanised boats and the issued loans largely ended up in their hands instead of in the hands of the fishermen (Thankappan Achari, 1987).

Though they usually did not become owners, fishermen became employed on mechanised boats as workers. This led to a significant rise in their incomes. In Quilon district the remarkable growth of the mechanised fleet caused even 'a massive transfer of workers from the traditional to the modern sector' and besides 'a large inflow of migrant workers' (Platteau, 1984:88). Thus the number of artisanal crafts drastically declined in that area. But the total number of artisanal fishermen in Kerala in 1969-70 was still around 91,000 and by 1979-80 had even increased to about 107,000 (Kurien, 1985: table 2). These fishermen also profited from the high export

prices. But as the fishlandings per boat in their case were much smaller and more varied such benefits remained relatively modest.

On the other hand, the artisanal fishermen experienced considerable harm from the increasing size and fishing practices of the mechanised fleet. Although there was apparently a common notion that the mechanised and non-mechanised sectors would not compete in respect of fish resources (see, e.g. Platteau, 1984) this was an erroneous perception. The South Indian Federation of Fishermen Societies (SIFFS, an apex body of NGO-initiated cooperative societies) emphasised in a report to the government the seriousness of the competition. It was stated that 'the boats competed for the same fishing ground and the same species, with the exception of perches' (SIFFS, 1984:3).

The high-powered boats were actually meant to operate outside the in-shore waters (0-50 mt depth). But already by the end of the 1960s their gradual encroachment on the in-shore fishing ground of the artisanal fishworkers was noticeable. As this coincided with a rapid growth of the mechanised fleet, conflicts with artisanal fishermen were bound to arise. The latter suffered from increasing incidents of damage to their fishing gear (Kurien and Mathew 1982). The financial losses sometimes experienced caused quite violent reactions. From the early 1970s onwards sudden outbursts of artisanal fishermen setting fire to trawlers occurred.

However, the seriousness of these conflicts over the physical space for fishing were by far outweighed by the consequences of mechanised fishing for the artisanal sector's share in the fish production as well as for the present and future supply of fish in general. The artisanal sector experienced a fall in production from 335,000 tonnes in 1969-71 to 167,000 tonnes in 1980-82 (a decline of over 50%) while its share in the total fish catches, which in 1969-71 was 89%, dropped to 57% in 1980-82 (Thankappan Achari 1986a). Meanwhile Kerala's total marine fishlandings in 1971-75 reached a highest ever average of 406,000 tonnes but in 1976-80 declined sharply to 332,000 tonnes, i.e. a decline of more than 18% (ibid). Given the considerable increase in the total fishing effort and the number of workers within both sectors, this implied an even more decreased catch per

unit effort and per capita (Babu Paul 1982; Kurien 1985). As to be expected demersal fish production in particular was affected (although the pelagic species also registered a decline).

As for the dynamics behind this fall of fish production, the frantic profit drive prompted by the unprecedented rise in export prices led to a related trend of overinvestment in processing facilities and in mechanised boats. This in turn instigated a vicious circle of overfishing of the in-shore resources to counter declining outputs whereas this decline also caused the artisanal sector to intensify its fishing effort.¹³ The danger of overfishing was the stronger because of the prevailing high pressure of fishermen on the in-shore zone in Kerala, which grew to intolerable levels as a result of the developments indicated. Besides, the new fishing method of bottom trawling caused ecological damage by disturbing the nursery grounds of fish and indiscriminately killing juvenile fish (Kurien and Mathew 1982).¹⁴ The reactions following on the depletion of the fish resources, which eventually also hit the mechanised sector, will be discussed below.

Turning to the area of marketing and processing we find a similar picture as in the sphere of direct production. Again the merchant strata of the artisanal fish economy rather than the fishworkers themselves had the capital and the position of control needed to cash in on new investment opportunities. In centres of the prawn industry like Quilon they built up a strong position as intermediaries between the fishermen/boat owners and the processing firms. Besides they sometimes invested in prawn peeling sheds where the labour-intensive processing activities of peeling and grading prawns took place (Platteau, 1984). Elsewhere like in Trivandrum district they became part of the extensive chain of merchant-middlemen and company agents linking the fishermen to the export companies. Through this marketing chain the merchants used to pass down a substantial share of the risks of the fluctuating prices of the exporters and of the fluctuating catches to the fishermen.

Again the artisanal fish distributors, in particular the self-employed women headload vendors, experienced negative rather than positive effects

from the rise of the export industry. In Trivandrum district, which was only indirectly affected, the depletion of the fish supplies resulted in a fall in the average sales per day. Also the procurement of fish for drying, which was for the women a kind of insurance system, declined (Nayak 1986). Centralisation of the fish landings caused that fish had to be procured from greater distances, and the enlarged size of the landings more often required bulk purchases for the handling of which many women lacked the financial resources and the relations of cooperation among themselves. Thus they became more dependent on purchase in wholesale markets. Although the vendors profited from the establishment of ice factories by merchant entrepreneurs the ice prices these factories charged were strongly fluctuating and exorbitantly high in peak seasons. Against the background of these combined factors, an aggravated problem of indebtedness among the women traders was noted by Nayak (*ibid*). With the extension of the rural market due to the improvement of fish preservation techniques and the increasing monetisation of the fish economy the women vendors came to cater mainly for the very low income households (Gulati 1981). Notwithstanding these developments, headload vending as an occupation maintained itself better in Trivandrum than in the districts of Quilon and Alleppy.

In Quilon, where the modernisation-cum-export drive had the most profound impact, and also in the neighbouring district of Alleppy, the numbers of headload vendors decreased rapidly since the early 1960s (Kurien 1984). Besides, other female artisanal crafts like fish salting and fish drying were disappearing. Among the factors which most probably led to this decline were the increased scale, species-selectivity and centralisation of the fish landings. Besides, the changes in the orientation and control of the marketing - and processing operations seemed to have played a role in it. It was observed that only women from wealthier strata commanding adequate financial resources and the right kind of contacts at the jetty managed to enter the prawn business (Gulati, 1982). For the majority of women who were from the poorer strata of fish workers this was impossible. Their new employment opportunities consisted of low-productive and poorly-paid jobs such as prawn peeling and grading, and the making of nylon nets

under a putting-out system. The wages concerned remained far below minimum wage requirements (ISST, 1984). Besides, the working conditions in the peeling sheds were very poor and the seasonal nature of the work gave rise to extremely long working hours during peak seasons. Not surprisingly, the women workers were forbidden to unionise. Over the years particularly young to very young unmarried women of ages ranging from 20 to below 15 years old were employed in the peeling sheds of Kerala while the more experienced but still unmarried prawn peelers beyond the age of 20 years migrated to more flourishing processing centres in other states (ISST, 1984).

This migration phenomenon related to the pronouncedly cyclical pattern of growth and decline which characterised the development process of the prawn industry. The discovery of new abundant fish resources promising large profits attracted a vast inflow of capital and labour, and led to overinvestment and overfishing. When overexploitation caused a sharp decline of the rate of profits capital and labour migrated again in search of new promising fisheries centres. The withdrawal of the big industrial enterprises was further speeded up by the apparently vehement opposition of Kerala's merchant entrepreneurs against their competition (Kurien, 1978).¹⁵ The migration of labour was spurred by the population pressure on the fish resources (associated with a demographic growth of the fishworkers' labour force of 2% per year) and the poverty among the majority of the fisherfolk.¹⁶ Not only young women but even more so young men migrated. The outflow of the latter was particularly directed towards the gulf countries of the Middle East.

Besides the workers another category of participants in Kerala's fish economy, notably the local consumers, were affected by the course fisheries development had taken. Whereas between 1960-62 and 1970-72 the per capita availability of fish in the state increased from 14.8 kg/person/year to 19.0 kg/person/year, between 1970-72 and 1980-82 this figure dropped to 9.4 kg/person/year (Kurien 1987:91). As the fish prices spiralled the higher income consumer categories began to substitute fish by other sources of protein (e.g. milk). But the poorer categories of consumers in the rural areas and also the fishermen households surely suffered a decline of their

nutritional standards (the latter because they could less and less afford to retain fish for their own consumption needs) (ibid).

4. Organised Responses from Below

Apart from opting out of the (artisanal) fisheries sector altogether, the response from among the artisanal fishing communities to the developments in the fish industry evolved along two lines. In the economic field there was a strong impulse for innovation. The artisanal fishermen experienced sharply the inadequacy of their technology in facing the competition arising from the trawler operations and the depletion problem. They tried to maintain their own by diversifying their crafts and gear while searching for improved technology that would be accessible to them. Another pressing problem to be tackled was felt to be the marketing of their exportable produce.

Meanwhile the survival strategies of the women vendors involved travelling to more distant shores and wholesale markets. In these pursuits they were confronted with serious transport problems. These were not only caused by the costs of fares but also and above all by the refusal of conductors and passengers to accept their smelling fish baskets on buses and trains. For them, this problem, as well as that of their increased need for credit to enable them to handle more bulky catches individually or in group, pressed for urgent solution. However, for women as well as men their various problems related to the trading of fish were by far outweighed by the problem of how to get fish.

In addition to the various attempts to adjust to the new conditions there was the urge to engage in direct confrontation. As indicated before, physical attacks against trawlers by artisanal fishermen increased in the course of the 1970s. The situation had become receptive for political organisation.

In this section we will analyse how from NGO side these tendencies were channelled and shaped into strategies to safeguard and promote development opportunities for the artisanal fish workers.

4.1 Unionisation and Union Struggles

The beginning of unionisation among the fishworkers in Kerala dated from 1977-1978. In these early years local priests in various areas along the Kerala coast (Quilon, Cochin, Alleppy) promoted the organisation of fishermen's unions to canalise the violent protest against mechanised trawling. Also in other coastal states such conflicts induced the formation of union-type fishermen's associations. In 1978 the leaders of the various fishermen's organisations in Goa, Kerala and Tamil Nadu came together to discuss the need for collective action on a national scale. They constituted the National Fishermen's Forum (NFF). Through this network unionisation was further promoted in the states represented. It must be noted in this respect that in the Kerala context unionisation was not a new phenomenon. It had been a well tried-out strategy for addressing the state by other categories of workers, which provided examples of what could be achieved in this way as well as models of how to go about it. This was an important initial factor facilitating and shaping the mobilisation of the fishworkers for union activities.

In Trivandrum district the first district-wide union mobilisation was launched by NGO-initiated women groups, the Mahila Samajams. This was in 1979, before the Trivandrum District Fishermen's Union (TDFU) was established. The mobilisation concerned the transport problem of the women vendors to and from markets. The problem was translated into a demand to the government for a statutory order stipulating the vendors' right to make use of public transport. 'It was the first time in the history of the fish workers that either women or men demonstrated in public and demanded from government a right' (Nayak, 1986^a:52). The action was sustained for almost two years. Although the demand of the women was not granted as originally posed, henceforth the fisheries department organised special buses for the women vendors as an alternative solution to their problem.

Meanwhile, mobilisation activities for the formation of the TDFU were taking place. The establishment of the TDFU in 1980 meant the end of the independent union activities of the women. They were integrated with the idea that the general union would also cater for their interests and political demands. At any rate, the women, together with the youth, became the backbone of the unionisation process as their involvement was indispensable for the sustaining of a certain level of mobilisation over time. The active participation of the seagoing fishermen (in Trivandrum district and elsewhere) was generally limited to specific agitations following emotionally arousing events. Only on some such occasions did the union struggles 'take on force', namely when the men's potential violence implied a law and order threat to the government.

The union joined the Kerala Latin Catholic Fishermen Federation which was the only one of its kind existing at the time. It had been formed by the small priest-led fishermen's unions in the Quilon, Alleppy and Cochin areas under the umbrella of the church. This religious basis impeded a broader mass mobilisation of the fishworkers, however. Efforts by the TDFU union leadership to have the federation put on an autonomous footing led to considerable friction between the pro and anti communal leadership within its ranks, as well as to interventions from the wider church to influence the balance of power concerned. These factors led in 1983 to a split among the union leadership at which the pro communal faction broke off and eventually established a new church-affiliated fishermen's federation. Subsequently, the original federation was registered as the Kerala Independent Fishermen Federation (KIFF).

In 1980-81 the K(I)FF organised the first larger fishworkers' agitations which above all concerned the depletion problem. Following demands launched by the NFF, the federation pressed for the adoption and subsequently for the implementation of the Kerala Marine Fishing Regulation (KMFR) Act. This legislation, passed in 1980, was meant to introduce measures to protect the fishing grounds and operations of the artisanal fishermen against the encroachment and indiscriminate fishing practices of the mechanised crafts (trawlers and purse-seiners). One of its principal

regulations constituted the reservation of a coastal zone up to 20-30 m. depth exclusively for artisanal fishing. Since 1978 the NFF had pressured the central government to provide guideline legislation to the states to that effect. Besides the enforcement of this territoriality, a specific demand of the Kerala Fishermen Federation in respect of the implementation of the KMFR Act was to ban trawling during the monsoon, i.e. the spawning season of the principal commoditised fish species. Precisely in that period trawling activities were at their peak.

An additional set of demands concerned legislation introducing development and welfare measures for the artisanal fishworkers, eventually embodied in the Kerala Fishermen Welfare Societies (KFWS) Act of 1980 and the Kerala Fishermen Welfare Funds (KFWF) Act of 1985. The former act laid the basis towards the formation of democratic village societies for the promotion of fishermen's social and economic interests while excluding the membership of others than active fishermen. The latter act provided for the creation of welfare funds for fishermen through contributions from the various parties involved in the fisheries industry (government, fishermen, private capitalist sector) (Thankappan Achari, 1986^a). These funds, as well as all government services for the fishermen, whether of a productive or a welfare nature, were to be channelled through the fishermen's village societies.

From 1980 onwards agitations concerning these demands were initiated during the monsoon periods in which little activity in artisanal fishing is possible. Besides demonstrations and petitions to the government they consisted of picketing, sit-ins, blocking of railway lines, and even hunger strikes. Also some court cases were fought, the legal route constituting the main strategy of the mechanised fishing boat owners. Their federation having in vain tried to prevent the adoption of the KMRF Act used every effort to hamper its implementation. Their strongest arguments against restrictions on mechanised fishing were the expected loss of foreign exchange earnings and of employment. On the latter point they gained the support of the workers on the mechanised boats who, although themselves by origin artisanal fishermen, were very much antagonised by the fishermen federation's agitation against mechanised fishing.

From the government's point of view both the arguments of the boat owners weighed heavily. Moreover, the interests of the merchant capitalists among them, being a powerful political force in Kerala, were not easy to bypass for any government whether of a left or right signature (cf. Murickan 1987). On the other hand, the extensive agitations of the artisanal fishworkers (particularly in 1981 and 1984) constituted a law and order problem which potentially could bring about the ousting of any political party from power. Thus caught between these two threats the government's reaction was, among other things, the establishment of a commission of inquiry. Accordingly in 1981-82 the Babu Paul Committee (with representatives of the government, the mechanized sector and the fishermen's unions) and again in 1984-85 the wholly scientist-based Kalawar Committee looked into the problems of fisheries development. Both Committee reports emphasized and elaborated policies for conservation and better management of the fisheries resources, for which the KMRF Act provided the legal basis. The Kalawar report, however, pointed out that since 1981 the mechanised sector had come to include rapidly increasing numbers of motorised artisanal fishing crafts, the growth of which would have to be restricted too. The specific demand of the KIFF to ban trawling during the monsoon, on which its major mobilisations of 1981 and 1984 had concentrated in particular, was endorsed in neither of the reports.

All in all, however, the federation's mobilisation efforts in the period till 1985 were quite successful. They had gained widespread support and played an important role in the establishment of a set of government laws and measures which in principle were very beneficial to the artisanal fishermen. However, the management and (re)distribution of the fisheries resources - which constitute the basic assets in fishing - appeared to pose questions to the state for the resolution of which it lacked the political determination and the institutional capacity (see Section 5). The political pressure which could be mustered through the fishermen's mobilisations was too limited to basically change that state of affairs. As has also been evidenced in other parts of the world, the state was willing to do something about redistribution of incomes rather than of basic assets. Accordingly,

in the period 1981-84 half of the total plan expenditure of Rs. 154 million was dedicated to welfare measures for the artisanal fishing communities (Kurien 1987). Besides, an important state initiative in the production sphere was the launching of a scheme for motorisation of country craft at the end of 1980. This included the distribution of outboard engines and related subsidy and credit arrangements. In addition similar services were made available for other productive purposes. Not surprisingly, these welfare services as well as increased productive services for the fishermen were deliberately used to demobilise the latter.

The initial success of the union mobilisations was very much due to the approach taken by the KIFF in its mobilisation work (together with the still by and large existing homogeneity within the artisanal fishery sector in respect of the mechanisation question). The federation had taken up the problems of the fishworkers from the latter's own perspective. It had defined the conflict as a struggle against the newly introduced technology in view of its destructive consequences for the livelihood of the artisanal fishworkers. With this it acknowledged that the conflict between the mechanised and artisanal sectors did not constitute a struggle between two clearly distinct social classes. This approach contrasted with that of party-sponsored unions which emerged since 1981. These focussed on the ownership of the new technology or on welfare issues and only in 1984 took up the depletion issue. Besides, the KIFF's mobilisation efforts concentrated on concrete demands, which helped to circumvent the religious or communal factor as an obstacle for gaining a broader mass support. Particularly during the 1984 agitations (when the federation had also gained its independent status) this resulted in the Alleppy and Cochin districts in the formation of some unions consisting of both Hindu and Christians. But in the core Hindu and Muslim areas of the central and northern coast (Trichur district and north of it) the KIFF did not manage to get any bases with the exception of a very small one in Calicut. Meanwhile, its bases in Trivandrum and Quilon remained totally Catholic.

Particularly in the first years of the unionisation process some other factors concerning the political climate contributed to its successful

development. In view of the fishworkers' religious background, which tied them to the political right, the confrontation with a leftist government considerably facilitated the union struggle. Also there was hardly any competition from the side of the political parties, and there was still no fierce opposition from the side of the church.

In the course of the 1980s however, this favourable political climate for the federation's activities came to an end. From 1981 onwards the activities of the party unions in the fishing villages put increasing pressure on the political space for the independent union mobilisations. In 1982 a change of government took place which brought a coalition headed by the Congress Party into power. This considerably weakened the KIFF's position. One of the reasons was the fishworkers' historical ties with this party, together with the government's attempts to coopt the fishermen by channelling various services to them (e.g. production credit and welfare funds) through party-controlled channels. Moreover, the government favoured communal forces including the new church-affiliated federation, and was extremely hostile to the independent federation. It refused the KIFF any contact and possibility for negotiation notwithstanding the fact that the latter in the period up to 1985 launched the main agitations in the fishery sector. The government's hostility was reinforced by the federation's inclination to cooperate with the unions sponsored by the parties of the left-democratic coalition through participation in their Joint Action Council. This cooperation somewhat increased the KIFF's bargaining power. But it did not compensate for the lack of access capability vis-a-vis the State which the independent status of the federation entailed.

A major consequence was that the KIFF could not really cash in on its mobilisation successes. The weakness of its position in the power struggles which conditioned, obstructed and largely defeated the implementation of the earlier mentioned Marine Regulation and Welfare Acts and policy recommendations, prevented this. This in turn had a seriously demobilising impact on the KIFF's mass base and demoralised its leadership. Another alienating influence on this mass base constituted the leadership's increasingly leftist inclinations. Besides allegations from the government side, suspicion

and misrepresentations about the latter tendency came from the side of the church. This did not fail to reinforce doubts and misgivings among the fishworkers. Particularly in Trivandrum district, where the influence of the church had always been very strong, this negatively affected the union work. (Ironically, on the side of the left parties there were also doubts and suspicion about the KIFF leadership's leftism, though in their case it precisely concerned the seriousness of it all.)

In addition to these problems, another awkward policy dilemma for the KIFF, referred to already in connection with the Kalawar report, loomed up in the course of the 1980s. It was caused by developments within the artisanal fishery sector itself which concerned the widespread adoption of outboard motors and other technical innovations similar to those found in the large-scale mechanised sector. This intensification of their operations was the fishermen's economic response to the depletion problem. As discussed earlier, this line of response was encouraged by state initiatives. Due to this trend, however, the resource crisis was seriously aggravated while the homogeneity within the artisanal sector vis a vis the new technology and its consequences was undermined.

The ecological problems noted in respect of the practices of the mechanised boats were now also created by the motorised artisanal boats, the number of which in 1986 already amounted to approximately 7000 (25% of the artisanal fleet). The motorised fishermen, moreover, faced considerable financial and other problems specific to their own operations. As a consequence, the process of arriving at an annual list of union demands became more burdened with conflict. New demands concerning the high costs of motorisation were added to the earlier demands on the depletion issue, reflecting the ambiguity now prevailing around the latter question. Policy measures and in particular longer term alternative development proposals for the benefit of the conservation of the fish resources became delicate matters to deal with in union discussions. The fishermen's own opportunities and aspirations in respect to modernisation were now directly at stake. In the face of the continuing competition of the large-scale mechanised sector, the operations of which remained virtually unrestricted, the fishermen were

hardly inclined to voluntarily restrain themselves. In turn this implied that further social differentiation among the fishermen would be an inevitable process although mitigated by the extent to which the new technology was collectively exploited.

These various problems posed pressing questions of strategy to the KIFF from 1985 onwards. Large scale agitations did not occur any more as the potential for collective action had declined in several districts. Although some educational work and more limited agitations still took place it may be concluded that at the Kerala level the union strategy stagnated in the last few years.

4.2 Cooperativisation and Technological Alternatives

The foregoing discussion has highlighted how the fishworkers' urge to engage in direct battles to counter their fishery problems was effectively channelled into organised political action. These political activities were particularly aimed at curbing the mechanised fishing operations by demanding resource allocation and additional resource management measures from the state. At the same time however, there was, as noted earlier, the tendency among the fishermen to intensify their own operations while urgently searching for technological and other economic alternatives to safeguard and, if possible, enlarge their share of the declining fish resources. For empowerment in these areas the fishermen of Southern Kerala turned to the possibility of authentic cooperativisation. A successful example of what might be achieved in this way was offered by a NGO-supported cooperative organisation in Trivandrum district.

The history of cooperativisation from below in Trivandrum district originated from a church-sponsored pilot project. It was initiated in 1961 and involved the creation of a new fishing village on an uninhabited plot of coastal land. The settlers were fishermen from neighbouring parishes, most of them from the poorest strata. A team of community organisers was invited to live and work in the village and for seven years a community development

approach was followed. But this was not adequate to confront the exploitative economic structure in which the fisherfolk were caught. This structure was due to the gradual expansion of the new village on coastal land owned by a big merchant from the neighbouring village. In return for his permission to settle, the fishermen concerned had to sell their fish through him and he thus gained control of three interlocking markets (land, product-market, credit). Together with one of the community organisers the men elaborated the idea to establish a cooperative to undercut the merchant's operations. The cooperative would take care of the auctioning of their fish, including the cashing of their money from the buyers, and would provide for the advancement of loans for economic and social purposes through a credit and saving scheme. The conception of the cooperative did not include the women fish vendors.

The establishment of the cooperative provoked counter moves from the local merchants, but it withstood the attacks and emerged invigorated out of this first struggle. In 1968 it was officially registered as a primary village society. In the following years it grew into a real business enterprise. Integrated with the auctioning system, it ran a saving scheme and a credit system, which in turn was linked to the purchase of fishing equipment for its members. An important technological innovation introduced in this way was the replacement of cotton by nylon nets, which significantly enhanced the productivity of the gear. The members contributed 3% of their catch towards the running of the cooperative.

This model was in broad lines followed in the extension of the cooperative system. The cooperative services of auctioning, credit provision and selling of fishing requisites catered precisely to the urgent needs of the fishermen to improve their technology and to fight for the highest possible prices for their fish. Moreover, at that time they were the only services of their kind available to the fishermen. As a consequence, particularly in the period 1979-82 the number of cooperative societies grew considerably notwithstanding sometimes violent opposition by merchants. This development was supported by training and animation activities of the Programme for

Community Organisation (PCO), the autonomous private development organisation which the earlier mentioned team of community organisers had meanwhile established.

In 1980 the 12-13 primary societies jointly formed a federation, the South Indian Federation of Fishermen Societies (SIFFS). This organisation undertook, firstly, the improvement of the marketing conditions of the fishermen's exportable fish, particularly prawns and cuttle fish. By selling directly to the export companies it eliminated the marketing chain of the merchants. A system of direct procurement against a guaranteed minimum price further mitigated the risks of price and supply fluctuations for the members. Whereas this activity was of great economic benefit to the fishermen, it sometimes resulted in heavy losses for SIFFS. Another marketing service of the federation concerned the local marketing of occasional bumper catches. Besides, it undertook the wholesale purchase of fishing equipment for the village societies. The latter operation was a quite profitable undertaking in the beginning of the 1980s.

In the following years SIFFS became engaged in two other projects, both concerning important technological innovations within the artisanal fishery sector. The first one involved assisting the fishermen in motorising their crafts by facilitating the purchase of outboard engines. The fishermen had become very excited about this possibility, for the realisation of which government subsidies and bankloans had become available. It allowed them to increase their action radius and their capacity to cope with changing weather and fishing conditions and thus increase their physical productivity. Besides, the increase of speed permitted fresher and more valuable fish landings. Within a few years however, it became clear that with the motorisation project the fishermen had dragged a Trojan horse within their walls. The imported outboard engines, designed for different contexts and purposes and crudely modified for running on kerosine instead of petrol, suffered frequent breakdowns. This problem was aggravated by the lack of adequate after-sales service and nearby workshop facilities, the scarcity of spare parts and the expensiveness of repairs and maintenance in general (Antony Raja 1987). As a result many engine owners came into

serious indebtedness problems. Besides, as already noted, the motorisation seriously aggravated the depletion problem as the scale of its adoption was very large. The declining productivity conditions in turn meant that the running costs involved in the continuous use of the motor became more and more uneconomical. But in the first half of the 1980s the fishermen's organisations rather preferred still to neglect warnings concerning the latter problems from the side of the PCO.

Meanwhile, SIFFS engaged in another highly innovative project, namely boat building. This project, started in 1981 by the Centre for Appropriate Technology in Kanyakumari district, involved the building of plywood boats as an alternative to the artisanal crafts. The wood from which these crafts used to be made had locally become very scarce due to the competitive power of paper factories owned by Indian-based multinationals (Gillet 1985). Moreover, the fishermen were interested in a new type of boat which could better withstand motorisation than the artisanal crafts did. The project was designed in such a way that it was at the same time an employment-creation cum training endeavour, and also otherwise care was taken that the technology would be under the control of fishermen's organisations. It soon got a much wider coverage including, besides Kanyakumari, the districts of Trivandrum and Quilon. In Trivandrum SIFF started its own boat-yard which produced new types of boats for its own as well as the Quilon area and by 1985 employed 15 workers. The following year it opened a branch in Quilon itself.

In 1985 some 20 cooperative societies, which since the early 1980s had been organised in Quilon and in Kanyakumari respectively, joined SIFFS. This induced a reorganisation through which SIFFS became a third tier body chiefly charged with research and development functions. The typical district level functions of marketing, facilitating bank loans and purchasing fishing equipment in bulk went to the Trivandrum district federation (TFF). To give some impression of the scale of operations at that time: the Trivandrum federation consisted of 15 societies with a membership of 2,000 fishermen, the K.K. federation was made up of 15 societies with a total of

1800 members and the Quilon federation covered 5 societies with 1,000 members.

In the field of boatbuilding SIFFS' ongoing research and development work included the modification of designs in response to fishermen's requests, the testing of designs from elsewhere, and the development of new designs for the northern coastal areas of Kerala. Besides, a search was launched for alternative material to replace plywood in the fabrication of the boats in view of the soaring price of this material as well. A second line of activity focussed on the development of remedial action in respect of the problem of motorisation. The apex body established a research and training (R&T) cell for this purpose. One of its tasks has been to study the basic operational principles and energy use of outboard engines and to develop and conduct a training programme in this field. The aim was to promote the fishermen's knowledge and insights on outboard motors (OBM), while enhancing their awareness concerning the destructive consequences of over-motorisation. The training programme consisted of two phases. The first one concerned the development of manpower capable to undertake the large scale training of fishermen, while also some of these trainees were expected in future to set up mechanical service-shops in their communities. Thus the training also had an employment generating effect. The second phase involved the training of 1,500 fishermen over a period of three years. This phase started mid-1987. In that year the R&T staff also launched experiments aimed at developing an appropriate motor-sailing arrangement for the Quilon area, and a project concerning the development of an inboard diesel motor with a local engine.

In short, the increasing financial, social and ecological problems associated with artisanal fisheries development has become a pressing problem for the apex body. Apart from the earlier mentioned remedial steps on which it has been working, a partial solution was also sought in the possibility of collective ownership of equipment. In view of the limited financial carrying-capacity of the majority of fishermen, collective possession enlarges the accessibility of the new technology in respect of purchase and exploitation costs and mitigates its social differentiation effects.

Thus collective possession makes the new technology an economically more sustainable innovation than individual ownership. Whereas in Quilon district this solution has worked out, in Trivandrum and Kanyakumari it did not find much acceptance among the fishermen. Generally speaking, the fishermen have had quite some difficulty in understanding the long term oriented sustainable development concerns of SIFFS which did not fit well with their own perspectives and aspirations. This has required a careful and gradual approach in order not to endanger SIFFS' relationship to the primary societies.

Due to differences in local conditions as well as in cooperative set-ups (organisationally as well as in respect of the kind of services provided), the cooperative situation at primary and district level differs somewhat in the three districts. Particularly in Trivandrum the functioning of the cooperative system has been negatively affected by the increased party and government interventions in the villages following upon the social unrest in the sector. Besides stimulating factionalism, this has resulted in the relatively easy availability of bank loans and other resources for the fishermen which formerly could only be acquired with the assistance of the cooperatives.

A major problem in all three districts has been the fierce competition from the side of the bigger merchants, whose financial and operational flexibility is much larger than that of the coop's. This allows them to continuously regain control in the field of fish marketing and equipment sales by undercutting the cooperatives' prices while selectively adapting to the latter's practices. Moreover, in respect of the fishing equipment sales the negative impact of the rising prices of the new plywood boats together with the operational bottlenecks and increasing costs of motorisation has been felt. Among the district level societies, the Trivandrum federation (TFF) has been most susceptible to these market forces. It is the only society with a marketing function, while the equipment wholesale business has been its sole economic basis (as its member societies have not been contributing to its running costs).

The Trivandrum cooperative experience in the field of marketing has made clear that opportunities for expansion in this direction are far from bright. This is not simply a matter of the limited material capacity of the artisanal fishermen but it is also very much due to the nature of the fish economy. The latter does not provide an adequate financial basis to compensate the overhead costs of cooperative organisation. For example, economies of scale cannot be easily realised because of the large variety and seasonal supply variations in the basic product (cf. Kumar 1988). Although the role of the cooperative system in this field thus seems bound to remain limited, it must be emphasised that its presence has constituted an important curb on the practices of local vested interests.

However, the fishermen, especially in Trivandrum, have tended to expect much more from their cooperative organisations. They have put the district federation under continuous pressure to come up with commercially attractive projects, which also has been transmitted to the apex body. SIFFS has been urged to study in particular the possibility for the fishermen's organisations to enter the export market themselves. This is what the Trivandrum fishermen most strongly desire at present, and it shows how much their aspirations have been affected by the transformations in the fisheries sector.

5. Alternative Development Visions: Their Long-Term Viability in the light of the Kerala Case

The foregoing analysis has demonstrated how the artisanal fish economy of Kerala has been subject to a rapid process of capitalist penetration, involving merchant as well as industrial capital (MNCs), with profound consequences for the fishworkers and the local consumers as well as for the basic fish resources. The analysis has also reviewed what responses from below have been generated by this process. Far from remaining passive, the artisanal fishworkers have individually and collectively developed a variety of strategies to confront as well as adjust to the newly emerged forces and

patterns of operation. However, notwithstanding politically forceful and economically highly innovative action, these struggles did not lead to a basic change in the dynamics and parameters of the process. What they achieved was improvement of the terms of incorporation for artisanal fishworkers, particularly fishermen, through the avenue of modernisation of the artisanal sector itself.

This combination of results has created a new situation for alternative development initiatives from below, involving almost unsurmountable policy contradictions and dilemmas. To consider this further it will be important to highlight the main features of the alternative development strategies underlying our earlier discussion. These strategies focussed on resource management and fishery development measures which aimed to safeguard the resource base of the artisanal fishworkers from encroachment by mechanised outsiders, while increasing the sector's competitiveness vis-a-vis the mechanised sector. Fishery development activities serving the latter objective included expansion of the effective fishing effort¹⁷ of the artisanal sector through technological innovation, and (further) increasing the value of their catch and the incomes derived from it through transport and marketing improvements. Whereas expansion of the action radius of artisanal crafts through motorisation could also have served the purpose of diverting their operations to deeper, less intensely exploited fishing grounds (beyond 25 m. depth), this has not been realised in practice (Thankappan Achari 1986^C). The collective action pursuing resource management originally was entirely oriented towards curbing and regulating the effective fishing effort of the industrial fishing fleet. The state was put under strong pressure to provide this. Such measures in principle would have served both the protection of the artisanal sector's fishing grounds and the strengthening of its competitive position in fishing. Prima facie therefore, the resource management and fishery development approaches were complementing each other. By the same token this implied that the strategies pursued at the individual and collective levels by and large seemed to be in harmony.

However, as discussed already, the encroachment was not curbed in practice although under the KMFR Act of 1980 a fishing zone exclusively

reserved for artisanal fisheries had been established. Moreover, the intensification of artisanal fisheries took alarming proportions, spurred by the pressures of increasing resource scarcity and competitive 'open access' at sea, by technological and commercial (particularly price) inducements, and by state interventions (cf. Kurien and Achari, this issue). As a consequence, the earlier perspectives of the fishworkers and their organisations on resource management and fisheries development had to be reconsidered. A new policy situation arose.

In the field of resource management policy problems manifested themselves around the questions 'management by whom' as well as 'for whose benefit and at whose loss'. As for the first-mentioned issue, heavy reliance on the state as the logical entity to effectively take care of resource management in the interest of distributive equity or the sustainability of basic resources has proven to be unrealistic. Actually this finding is not particular to the Kerala situation: the same experience has been reported in respect of other countries, e.g. Malaysia (Gibbons 1976), Indonesia (Collier 1977), Philippines (Bailey 1984), Namibia (Moorsom 1984). A variety of reasons for this phenomenon has been put forward, such as governments' production priorities and foreign exchange needs; scientific-methodological¹⁸, administrative and financial implementation constraints; and last but not least, the lack of relative autonomy of the state vis-a-vis powerful commercial and/or industrial interests. Besides, centralised resource management by the state does not seem to be an optimal option anyway as it precludes sufficient user groups' participation in working out viable solutions (Pollnac et al. 1983, McCay et al. 1987)

The importance of the latter point for the Kerala fishworkers as a possible user group themselves becomes evident from considering the second aspect of the newly arisen resource management problematic. It concerns the fact that besides the fishing effort of the mechanised industrial fleet, that of the motorised artisanal crafts also appeared to contribute to the resource crisis and its component problems of over-capitalisation and depletion. Motorised fishing, too, negatively affected the access of non-motorised fisheries to the fish resources and contributed by its unequal

competition to their (potential) decline (Antony Raja 1987). Above all shore fisheries such as beach seine fishing were harmed by this and fell into decay, a susceptibility which also has been noted in other contexts (Nieuwenhuys undated; cf. Mansvelt Beck 1987). All this implies that resource management for the purpose of production sustainability and redistribution of basic assets has also become an internal policy question within the artisanal sector.

This task is the more difficult to tackle as under prevailing resource crisis conditions the measures needed to realise it are in contradiction to the predominant motives of artisanal fisheries development. As Emerson puts it, 'if the fishermen need more fish and the fish need fewer fishermen, developers will be hardpressed to have it both ways' (1980: 2). Moreover, in the views of the artisanal fishermen self-imposed restrictions on their production intensification efforts would just benefit 'the other side' as long as the operations of that competitive sector have not been effectively restricted.

What new strategies, then, could be resorted to in the present stages of incorporation and resource crisis? The problematic nature of capital-intensive marine fisheries development which has similarly manifested itself in various other Third World areas, has led to various efforts at formulating alternatives. Different quarters (notably concerned scholars and NGO-support groups within and outside Kerala) have advanced proposals intended to curb the present trends of depletion of the fish resources and of their de facto redistribution at the cost of the majority of fishworkers and local consumers.

Approaches to these major problems have been geared towards ecological and economic sustainability as important ultimate goals and policy criteria. Ecological sustainability points to the biological and ecological parameters for resource exploitation, while economic sustainability involves additional criteria such as net income levels and equitability of income distribution.¹⁹ Solutions have been focussing particularly on the policy instrument of 'appropriate' production technology from the above point of

view, and on collective institutional arrangements for resource management directed accordingly.

The question raised by these alternative development proposals with reference to Kerala and similar situations is whether or to what extent they are effectively tuned in on the actual socio-economic and political dynamics of the incorporation and resource crisis processes. Certain limitations in this respect seem to stem from a too narrow or reductionist theoretical perspective and from a conceptualisation implying a dichotomy between 'traditional' and 'modern' sectors. As a consequence, these alternative visions tend to focus on too restricted solutions and to underestimate the pervasive ways in which individual survival strategies and related value-systems are being subjected to reorientation in the wake of the fish industry's transformation.

To see this further, we should first note that in the development of both types of policy instruments referred to above, the artisanal fishing community and fishermen's organisations have been given a central role to play. With reference to resource management, while pointing to the desirability of community management of 'the commons' above centralised state resource management, Bailey (1984: 102) states, for example, that 'the most promising solution is one built on the motivation and resources of the small-scale fishermen themselves' (cf. also Collier 1977, Panayotou 1982, Runge 1986). Besides its expected value for empowerment, an important argument advanced in support of this approach points to the merits of traditional fishing science and technology, and the communal ecology-preserving and redistributive values and mechanisms associated with it. Such merits, it is argued, should in essence be preserved and consolidated to provide an institutional and scientific-technological basis for a sustainable development process (see e.g., Bailey et al. 1986, Kurien 1986^a and 1986^b, Panayotou 1982). In the words of Bailey et al (1986: 1271), 'the concept of traditional resource use rights ... provides an ethical basis, grounded in historic usage, for establishing policies to guide fisheries management and development efforts'. And in a recent seminar report on the Kerala Fisheries Crisis, Kurien urges: 'we need to build up from the strengths of

traditional technologies and traditional knowledge of fishing and fuse this with the best of the modern science and technology that can be applied to this field' (1987: 96). In short, there is a basic conception of preserving and building on the 'traditional system' and the united force of its fishermen.

Several aspects of these policy proposals raise queries, however. First, their focus suggests that the depletion and distributive equity crises are explained by the nature of the fishing technology (and related patterns of ownership and operation) and by the open access situation at sea. However, the Kerala experience shows that besides these factors demographic pressure and market as well as political forces may play a major role. The importance of the latter elements calls for attention to the macro-economic and political preconditions for implementing the proposed policies with any chance of success.

For example, collective management solutions for the commons require a state framework capable of unambiguously establishing the collective ownership rights of the artisanal fishing community over a clearly defined coastal zone. Besides legal regulations to that effect, this would involve the provision of an administrative, legal and coercive environment permitting this community to exercise their ownership rights internally as well as vis-a-vis the non-owners (McCay et al. 1987, Wade 1988). The story of the fishworkers' struggles in Kerala, which have been pursuing such a form of territoriality, highlights the political constraints blocking this road. As Wade suggests, collective management approaches do not have much chance of success if asset ownership and related power positions correlate negatively with it, and 'those who benefit from retaining the commons' are only the weaker groups (1988:190,216). Only if commercially attractive alternatives would arise for the dominant capital interests in the fishing industry the importance of the latter bottleneck might be reduced. Even then it remains to be seen, however, whether the proposition of devolving state power over basic resources towards local people's organisations will be an acceptable idea for the state apparatus concerned.

A crucial economic precondition for successful self-management of the commons is the development of alternative employment for surplus labour. Otherwise measures for reducing the overexploitation of these fishing grounds will just not be enforceable, as the earlier quoted statement of Emmerson suggested already (cf. also Panayotou 1982, Pollnac et al. 1983). In the context of India the attention in this respect has been directed particularly towards deep-sea fishing (i.e. beyond 50 m. in depth). In line with past policies, however, the central government plans to promote this branch of fisheries seem to favour a capital-intensive and export-oriented approach as well as heavy reliance on private capital (The Economic Times 21-8-1986, Seminar Committee Fisheries Research Cell PCO 1987). Similarly, in Kerala the combined weight of commercial, political and state financial interests at the macro level is more likely to lead to policy choices providing alternatives for those commanding capital rather than benefitting large numbers of dispossessed fishworkers. In the light of this commonly prevailing state of affairs, the question of feasible strategies for employment generation and the room for trade-offs between productivity and income levels of present generations and bioecological sustainability objectives require serious attention within alternative development proposals for overexploited commons (see note 20).

Further queries in respect of the alternatives put forward arise from their conception of building on the ecology-preserving and redistributive principles of traditional systems and communities. This would be expected to provide the necessary cultural, social and political basis for the collective resource management approach. Important assumptions underlying such a conception involve, firstly, the continued existence of an essentially unchanged traditional system or the possibility to revive it (Panayotou 1982), notwithstanding the transformation processes connected with the establishment of a modern, capital-intensive fish export industry. Besides, such a traditional system is assumed to constitute a relatively undifferentiated 'community' with a clearly moral and conservationist outlook. The first premise, however, implies a 'dual economy' theoretical perspective,

which actually appears to be common to many appropriate technology approaches (James 1980). The latter perspective appears to be in keeping with Scott's conception of the 'moral economy of the peasant', which he holds to be an important source and ideological basis of peasant resistance and radical action (Scott 1976, 1985).

Irrespective of the theoretical merits or demerits of these perspectives per se, the evidence in this paper seems to point to their preclusion of a proper grasp of the impacts of the industrial transformation processes on the artisanal sector and communities. Actually, in Kerala the artisanal sector was not really undifferentiated altogether. Although its fisherfolk could be defined as a 'community' by their relations vis-a-vis dominant economic forces and the state, they were internally divided along religious and ethnic lines and on the basis of heterogeneity of production conditions and technologies. Besides, social differentiation has been rapidly increasing as modernisation and incorporation proceeded. This was due to technological innovations within artisanal fishing (of which the least 'appropriate' one from the point of view of sustainability, i.e. motorisation, has been the most popular), to labour productivity differences between the self-employed and salaried fishworkers and to migration remittances. Differences in opportunities to participate in the mechanised sector or benefit from modernised small-scale fisheries have caused divergence of interests in the different production forms within and between villages (cf. Platteau et al. 1985, Nieuwenhuys undated). The incorporation process also has implied a divergence between the interests of the fishermen who became dedicated to exports, and the poor rural consumers together with the small scale (women) distributors which served them.

Furthermore, the emergence of modernised artisanal fisheries as a kind of intermediate form of production has blurred the sharpness of the distinction between the artisanal and mechanised harvesting methods and their (presumed) respective ethical standards. Adherence to redistribution systems appears to have been declining (Nieuwenhuys undated) while also differentiation in job and educational preferences has been noted (Platteau et al. 1985). Such changes in outlook may have been induced by increasing

resource scarcity on the one side, and rising incomes and rising aspirations on the other. In short, the sharply increased heterogeneity among the artisanal fisherfolk together with the urgency of their resource constraints appear to have been eroding whatever socio-cultural and political basis there was for collective management solutions (cf. Popkin 1979, Runge 1986).

All this is to suggest that alternatives basing themselves in specific traditional features of the artisanal mode of fishing and communities may soon lose their viability in a competitive framework which is ruled by drastically different operational principles. As the mobilisation experience of the fishworkers union has shown, it is unrealistic to expect that the fishermen will (still) be ready to act as a collective in addressing the serious issues of ecology and depletion at the cost of their individual interest in maintaining their relative positions within the competitive framework. Thus the political and social acceptability of such alternative development proposals will represent not only a problematic question vis-a-vis the dominant economic forces and the state, but also with the artisanal sector itself once it has been caught in the dynamics of incorporation.

In conclusion, none of the above observations are to imply support for, let alone propagation of, the introduction of novel production techniques and relationships irrespective of existing practices and patterns. For policy-makers and observers alike, it is important to recognise the (changing) socio-economic basis as a point of departure for interventions and interpretations. The point put forward here, however, is that analyses cast in terms of 'tradition' entail a danger of reifying non-existing, or no longer existing, patterns of production and of social relationships into a policy ideal for action. Besides, only a comprehensive approach which would both promote alternative employment opportunities and establish an effective resource management regime seems to offer a potential way out from the crisis. But whether this will be attainable can hardly be answered affirmatively. This is so because the acceptability of such alternative development proposals raises an unfortunate deadlock: the macro-preconditions for collective management solutions will not come about

without strong political pressures from below, whereas the latter pressures cannot be adequately realised without the likelihood of such macro-conditions being fulfilled.

NOTES

1. The continental shelf of Kerala, i.e. the area from the coastline to a depth of 200 metres, extends over some 40,000 sq. km. In the early 1980s its production potential or Maximum Sustainable Yield (MSY) was estimated to be approximately 1 million tonnes of which 63% consisted of pelagic (i.e. surface- or midwater dwelling) species and 27% of demersal (bottom dwelling) species, the latter comprising 7% of prawns and 3% of cephalopods (Babu Paul 1982:67).
2. The figure of 122,000 active marine fishermen originates from the earlier mentioned 1979 Census of Fisherfolk in Kerala (Government of Kerala 1982). However, in 1981 the CMFRI Marine Fisheries Information Service estimates the number of active fishermen to be about 131,100 (Thankappan Achari 1986^b:5).
3. Census data of 1979 indicate that even at that time about 84% of the households lived in thatched huts or semi-permanent houses, 90% of the houses were not electrified and hardly any house had latrine facilities while nearly 67% of them lacked access to nearby drinking water (Government of Kerala 1982).
4. In 1981 its sex ratio, i.e. the number of women per 1000 men, was 975 while the sex ratio of the general Kerala population was 1034 (Indian Census data as cited by Gulati 1983^b:27). A preponderance of males over females in a poor population is an indication of the disproportionate way in which the burden of poverty falls on women and female children (Agarwal 1986). Considering that fishing is an extremely risky occupation and exclusively a man's job this indicator is particularly revealing in the present context.
5. According to Kurien (1986^a), sensitivity to ecological conditions was also inherent in the knowledge system underlying artisanal fishing, which was characterised by a holistic orientation towards the ecosystem, and in the related value system inculcating a deep respect to the sea and its life-giving nature.
6. The point made by Firth that 'the fisherman does not live mainly on fish' (1966:3, quoted in Bavinck 1984) may serve to illuminate the market dependence in the sphere of consumption. In the sphere of production, the highly perishable nature of the daily fish catch requires daily marketing activities while for the acquisition of fishing crafts and gear fishermen also rely (increasingly) upon the market. Replacement of particular fishing gear is a frequent necessity for a fisherman as it is easily lost or damaged and its economic depreciation is high. The capital sums involved are generally considerable which makes access to capital of key importance to fishermen (cf. Bavinck 1984; Scheepens 1987).

7. The southern coastal area comprises the districts of Trivandrum and Quilon; the central coastal area the districts of Alleppy, Ernakulum (including Cochin) and Trichur; and the northern coastal area the districts of Malappuram, Kozhikode (Calicut) and Cannanore. Each of these areas represents roughly homogeneous regions in respect of the predominant characteristics of their fishery sector (Kurien & Willmann 1982:10).
8. Since the 1960s, however, the prices of kattumarams as well as other wooden crafts particularly the dug-out canoes have been rising sharply as the logs used in building them are hardly obtainable any more. This is due to deforestation and the increased use of wood for various industrial purposes.
9. According to the 1979 Census of Fisherfolk (Government of Kerala 1982) 60% of the fishermen households in Trivandrum district had an annual income below Rs.1000 (at that time approximately U.S.\$80.-) No other district of Kerala had a higher percentage whereas only in Kozhikode district the same percentage was found.
10. Catholic believers are dependent upon their Church for all major events in their personal and family life from birth to death. Thus discord with the Church affects them in their marriages, the baptising of their children, their death. This poses a tremendous problem for secular social movements which are often perceived by the Church as a threat to their dominant position.
11. This was the first bilateral development project in the field of fisheries development in India.
12. Later developments in the artisanal fishery sector proved the judgement of these foreign experts on the sector's lack of modernising capacity completely wrong. Such out of hand dismissal of artisanal fishery by foreign consultants leading towards a choice for capital intensive fishing and fish marketing technology has also been noted in other regions (e.g. Oman by Donaldson 1980; Ghana by Vercrijse 1984; see also Bailey et al. 1986).
13. More data about these intensification efforts and related activities to modernise the artisanal technology are given in Section 4.2
14. Whether mechanised fishing had a depleting impact by affecting the demersal resources biologically has been a matter of discussion. The government initiated Babu Paul report concluded in 1982 that, although 'there are definite indications of economic overfishing in the context of unregulated entry into fishing and insufficient management measures' ... 'the opinion of the Committee is divided about the [biological] depletion of marine fishery resources' (Babu Paul:70-71). However, the continuing production decline, in the 1980s, of the demersal species

(which normally are not susceptible to long cyclic fluctuations) appears to confirm the case of biological depletion. As for the noted decline of the pelagic fish production, this has been attributed to natural fluctuations (Babu Paul 1982) whereas the high level of exploitation of the major species particularly oil sardine (see Thankappan Achari 1986^b:7) also may have played a role in it. The high fishermen density and increasing productivity within the artisanal sector was mainly responsible for this up to 1979, whereafter mechanised purse-seining became an additional threat for the pelagic resource supply.

15. Upon the entry - in the early 1970s - of the big industrial capitalists into Kerala's sea food export industry the local merchant capitalists induced the Central Government to put the former's operations under severe restrictions. They feared the competition by the industrialists 'in terms of finance, control over production, and what is most crucial in this field, the control over the market' (Kurien 1978:1563). The example illustrates that the introduction of the fish export industry did not only generate conflict of interest between capital and worker-producers but also between competing forms of capital, i.e. merchant and industrialist.
16. According to the 1979 Census of Fisherfolk 50% of the fishermen households had incomes below Rs. 1000 per annum (Government of Kerala 1982). Only 3% of the households had incomes above Rs. 3000 per annum, signalling the increase of social differentiation among them. In 1980 crew remunerations per fishing day were below the prevailing daily wage rate of landless agricultural labourers in Kerala (Kurien & Willmann 1982).
17. Fishing effort is an index of all inputs used in realising some catch. The effect of the fishing effort on the fish stock, or 'effective fishing effort' denotes the physical catch results or resulting fish mortality (Panayotou 1982:4).
18. As modern fisheries management approaches have been developed with regard to the single-species conditions of temperate zones, adequate scientific-methodological tools to assess and manage multispecies fisheries in tropical waters are by and large still lacking (Institut Masyarakat 1979, Panayotou 1982).
19. As Tisdell (1988) points out, the concept of economic sustainability is still only vaguely defined. Suggested assessment criteria are qualitative rather than quantitative and involve objectives which as a rule cannot be simultaneously achieved. The latter problem entails the inevitability of trade-offs between contradictory objectives and poses the demand for guidelines in this respect (ibid:375,378).

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