FACTORING SOCIAL AND CULTURAL DIMENSIONS INTO FOOD AND LIVELIHOOD SECURITY ISSUES OF MARINE FISHERIES

A Case Study of Kerala State, India

John Kurien

Working Paper No. 299

February 2000

FACTORING SOCIAL AND CULTURAL DIMENSIONS INTO FOOD AND LIVELIHOOD SECURITY ISSUES OF MARINE FISHERIES

A Case Study of Kerala State, India

John Kurien

Centre for Development Studies
Thiruvananthapuram

February 2000

This is a revised version of a paper presented at the Workshop on Social and Cultural Aspects of Fisheries held at the University of Colorado, USA in November 1999. I am grateful to James McGoodwin, Richard Pollanac, P.K.Michael Tharakan and an anonymous referee for comments and suggestions. They bear no responsibility for errors that may remain.

ABSTRACT

Some of the social and cultural aspects of marine fishing communities, as they emerge in the course of the pursuit for food and livelihood, are the subjects of this paper. The focus is on the marine fishery of Kerala State, India and attempts to show how these dimensions evolved in the context of very specific resource and ecological determinants. Social and cultural dimensions have been often considered a "drag" on the transformation of societies into modern entities. However, the numerous failures encountered when development is given an exclusively techno-economic orientation, provide the basis for a new search to give meaning to hitherto neglected socio-cultural norms.

This search is all the more relevant in this era of globalisation that set into momentum the tendency to homogenize social and cultural specificity. The sustainability of any society will depend in large measure on the degree of diversity and self-reliance that it is able to maintain with regard to reproducing its social and cultural concomitants. At the core of this are issues pertaining to the food and livelihood security of its people.

The paper examines the *visible manifestations* of deeper social and cultural attributes in the marine fishery sector, which have been fashioned over a very long history. The list includes: the nature of the sharing patterns in the fishery; traditional knowledge and technology; the old and new institutional arrangements in fishing communities; fish and the question food security; and the role of women.

JEL Classification: O17 ; O20: Q22

Key Words: Marine fisheries, Kerala State; social and cultural dimensions; ecological determinants; food and livelihood security;

INTRODUCTION

The social and cultural aspects of every society evolve in the context of certain interacting ecological, demographic, technological and economic characteristics particular to it. The ecological and related resource determinants are characteristics that tend to exhibit a fair degree of stability since they are significantly nature-determined. The demographic, technological and economic variables seem to undergo a greater degree of change, as they are products of human enterprise. The social and cultural aspects, which arise from this historical nature-human interaction, takes effect within a workaday routine of livelihood and provide the element of specificity to the society. They accumulate over time and form a corpus of certain behavioural facets of a people. In the more ancient societies, such as those in Asia, these socio-cultural traits have been handed down largely through learning-by-doing and oral traditions of songs, stories and sayings. They evolve to represent a "world view" of the communities and represent in succinct fashion a coherent "practice-knowledge-belief" system (Gadgil et al, 1993).

The social and cultural aspects of developing societies were considered to be a "drag" on their transformation into modern economies. For example, certain communitarian principles and diet preferences, which had evolved in the context of resource fragility and population pressure, were perceived to be barriers to technological change and

market expansion. The many failures of the largely techno-economic orientation to development policies, provide the basis for a new search. A search for giving fresh meaning to hitherto neglected socio-cultural norms before they are transformed beyond recognition.

The initial resource and ecological context of fish, and much of the traditional techno-economic aspects of fisheries in the tropical developing countries of Asia, have given rise to a considerable fund of socio-cultural features which are rooted in the context of people's pursuit for livelihood and food security. Examining some facets of this neglected reality, provide an opportunity to assess their continued relevance for the inextricably intertwined objectives of maintaining the integrity of the ecosystem and ensuring the food and livelihood security of the community.

Such a pursuit also attains particular relevance in this era of globalisation that often entails a continual substitution of culture and cultural knowledge by objective knowledge and formal institutions. This process sets into momentum tendencies for homogenization of social and cultural specificities. In the long run this threatens the variety and diversity of both the practices and the visions which societies have about their future. The sustainability of any society will depend in large measure on the degree of diversity and self-reliance that it is able to maintain with regard to reproducing its social and cultural concomitants. At the core of this are issues pertaining to the food and livelihood security of its people.

This paper pertains to Kerala State, the leading maritime province of India. Kerala has a unique fishery resource context that is intertwined with certain specific techno-economic and socio-cultural features of its marine fishery. This provides an interesting example of how fishery managers can benefit from fathoming current practice for deeper

meanings that can make significant contributions to just, participatory and sustainable fisheries development and management.

FISH AND FISHERIES OF KERALA STATE

The Ecological and Socio-cultural Context

Kerala is a small state situated at the southwestern end of the Indian peninsular. It has a coastline of about 600 kilometres and is only 100 kilometres across at the widest point. It is bounded snugly between the Arabian Sea and the range of high hills called the Western Ghats. There is an age-old tradition about the origins of this narrow strip of land. It is said that a sage called Parasurama, much like the turbulent god Thor of the Nordic myth, flung his battle-axe far out into the heaving Arabian Sea only to see the waters recede and the land of Kerala, emerge into the sun and air (Chaitanya, 1994).

There is very good evidence that the land of Kerala has been shaped by a geological upheaval. The Western Ghats that form the eastern boundary of the state appear thrown back and heaped up, as if a deluge burst through them. Marine fossils including coral reefs have been unearthed in the present midlands pointing to the fact that the sea once extended right unto the foot of the Ghats. Geologists are of the opinion that the subterranean passages, dating back from the cataclysm, form the basis of the extensive network of rivers, backwaters and lagoons that criss-cross the state today. There are 41 west-flowing rivers with an average length of 64 kilometers each. They have their sources in the dense tropical rain forests on the Ghats. The lagoons and backwaters, which experience the tidal effect even 50 kilometers upstream since much of this land lies below sea-level, cover an estimated area of 355,000 hectares (Government of Kerala, 1983).

The nutrients from the hills and forests are washed down with torrential monsoon rain. This accumulating silt finds its way through these waterways into the littoral currents of the coastal waters. Here, during the monsoon, they lead to the formation of mud-banks called *"chakara"*. These mud-banks, which form strange havens of calm anchorage particularly when the sea is rough, have been known to the mariners of ancient times who have visited Kerala. When these banks form, they teem with fish and prawns.

Mention of the fishery resource plenitude and the fishing communities of this region are found in the early poems of the 1st- 4th Century AD called the Sangam Age (Pillai & Ludden, 1997), and the writings of Pliny, a geographer and famous Roman traveller of the 1st century AD (Ray, 1993). In later centuries (7th and 8th AD) the Arab traders found their way to the northern part of Kerala by following the teeming shoals of oil sardines which migrate down the west coast of India hugging close to the in-shore waters. Friar Ororic who sailed down the southwest coast of India in 1320 observed that:

> *"there are fishes in those seas that come swimming … in such abundance that for a great distance into the seas nothing can be seen but the back of fishes, which casting themselves on the shore, do suffer men for the space of three daies (days) to come and take on many of them as they please."* (Quoted in Day, 1865).

More recent periods of colonial rule in a northern region of present day Kerala (also called Malabar) saw the systematic documentation of the flora and fauna for the scientific value of ichthyology. Francis Day's "Fishes of Malabar" (Day, 1865) was one of the kind. The coastal waters of the southern region of present day Kerala (also called Travancore)

were calculated to yield about 250 kilograms per hectare of coastal water which:

> *"is double the quantity produced by an acre of water considered to be rich by the fishery experts of the world"* (Velu Pillai, 1940).

The potential annual yield of the coastal waters was estimated at half a million tonnes. This resource plenitude made administrators speculate that the poor fishery of that time could become the Cinderella of industries in Kerala in the future.

The Western Ghats isolated the land of Kerala from the rest of the subcontinent. This accounts for the significantly different socio-cultural features of the people of this state compared to the rest of the Indian sub-continent. They seem to have been more open to the influences of other cultures coming to them across the seas. Through the ages the Phoenicians, Egyptians, Greeks, Romans, Syrians, Moors, Arabs, Chinese, Dutch, Jews, Danes, French, Portuguese and the English, in their respective times, have vied for the spices and the timbers of this land in exchange for gold, linen, ceramics and other luxury products (Curtin,1984; Arasaratnam, 1994). Over the 20 to 30 centuries, these communities have not only exchanged their wares but also left their imprints on the techno-economic and socio-cultural, fabric of the people of Kerala. These influences are evident in numerous technologies in traditional occupations, in the architectural designs, the nuances of language and the food habits. All the major religions in the world had made their early presence in Kerala and these communities, that exhibited great economic inter-dependence, lived together in harmony, giving and taking from each other's cultural foundations. The narrow coastal tract of the region became the cultural melting pot.

At different periods in the history of the last millennium, the carriers of the so-called Aryan tradition, the Arabs and the Portuguese, came to have considerable influence on the socio-religious aspects of the coastal fishing communities of Kerala who were damned as "impure" and "untouchable" within the strictly Brahmanic terms of Indian culture. Given the multi-religious cosmopolitanism of this coast, Kerala is the only maritime state in India (there are nine in all), where the Muslim, Hindu and Christian marine fishing communities have a significant presence. The Muslim fishing communities dominate the northern coastal region, the Hindus are concentrated in the central region and the Christian are in the majority in the south. These communities are also marked by separate maritime traditions and fishing technologies both of which have been influenced by the trade and cultural influences with which the particular community has been associated (Ray, 1994). Equally, perhaps more importantly, factors pertaining to the physical oceanography and the marine resource configuration of the waters in which they fish have been overriding factors in shaping traditions and technologies. A famous treatise of the 12th century called *Valavisu Puranam* (An Epic on Fishing) contains several references to the method of fishing in vogue and to the arts and sciences relating to fishing.

The ecological setting of a narrow strip of land interlaced with a network of rivers, lagoons and backwaters flowing into a nutrient enriched coastal sea ensured a plenitude of aquatic resources. This factor, clubbed with the diversity of the fishing technology, provided the socio-ecological basis for fish becoming an integral part of the cuisine of this region of the Indian sub-continent. With the land being criss-crossed with water, the human settlement pattern in Kerala became both very dense (on average 750 per square kilometre) and yet widely dispersed. This, in the main, accounted for more decentralized commodity barter and exchange networking between fish producers and fish consumers. Along the

coastline, however, the marine fishing population, numbering over 700,000 in all, was spread along the 600-kilometer coastline in 220 densely populated agglomerations huddled in areas no wider than half a kilometre from the seafront. This makes the marine fishing villages of Kerala the most densely populated (2330 per sq.km) among the maritime states of India.

Kerala State is also unique in that all religious groups including the Hindus -- who are strict vegetarians in most other parts of India - are avid fish consumers. This fact reiterates the important determining role of the ecological setting in shaping food preferences. Fish has thus become a culturally important and indispensable part of the diet. In this most densely populated state of India, it is estimated that 96 percent of the 30 million population eat fish (Srivastava et al, 1991) With rice as the main source of carbohydrate, fish is an indispensable component of the food intake of both the rich and the poor. There is a variety of rice called *Pokkali*, which can be grown in the brackish waters near the coast, along with fish and prawns. Composite culture of rice and fish is also practiced in the fresh water regions of the state. Fish accounts for over three-quarter of the animal protein intake of the average Keralite. In the fishing communities the share is naturally higher. The consumption ranges between 15 - 20 kg/capita/year depending on the varying annual availability. The all-India average is around 4 kg/capita/year (Government of India, 1996)

For fishing communities the importance of fish to livelihood and nutritional security can be gauged from the fact that oil sardines, the most abundant marine specie, is called *kutoombum-pularthi*, which means the "family provider" or "family caretaker". It is also the most popular specie among the fish eating populace of Kerala. This nutritious fish has found its way to the fish markets in every nook and corner of Kerala -

initially in dried and salted form, but with the advent of ice in fresh condition. Among the consumers, oil sardines are also referred to as the poor family's protein. It combines deliciously well with tapioca (manioc) which is another important source of carbohydrate of the people of Kerala - particularly the poor.

SOCIAL AND CULTURAL ASPECTS OF FISHERIES

Implications for Food and Livelihood Security

The examination of the social and cultural dimensions of fisheries in Kerala will cover a few areas of concern, which have a continued bearing on the future patterns of fisheries management in Kerala. These need to be situated in the background of a particular modern history of fisheries development in the region. Briefly stated, it is a history of state-led "modernization" which attempted to copy the paradigm of the northern, temperate fisheries model of standardization of craft and gear so as to get the maximum output from the sea. The foundation for this was laid by the world's first international tripartite development project - the Indo-Norwegian Project for Fisheries Development, jointly overseen by the United Nations, and the Governments of Norway and India (see Klausen, 1968; Galtung, 1974 and Kurien, 1985 for details). This development model got linked to an export orientation drive. For about three decades from the formation of the state of Kerala in 1956, fisheries development was associated almost totally with the catching and exporting of shrimp.

The lopsidedness of this process, particularly its lack of embeddedness in the techno-ecological and socio-cultural history of fisheries in the region, and more importantly that it "left out" the majority of the working fishing people from its ambit, came to the fore only in the early 1980s. At that time, the real, artisanal fishing communities

organised themselves to protest against the marginalisation which they experienced as a result of this approach. It was fisheries development without fishworkers development and an ecological and socio-cultural disaster as far as they were concerned (See Kurien, 1992).

What I will highlight in this paper are some of the important dimensions of the fishery of Kerala that have *not* formed part of the conventional "modernisation" agenda of fisheries development in Kerala. The aspects examined and the insights offered are based on 25 years of my first hand involvement with marine fishing communities in Kerala. I spent the first five of these years living in fishing villages in the southern Thiruvananthapuram district with a team of social activists. We were helping the communities to market their fish more effectively; to introduce appropriate technological changes in their fishing activity and to make improvements in their overall quality of living.

The significance of these initiatives with fishing communities needs to be set against the overall experience of socio-economic and cultural transformation of Kerala State as a whole. Kerala has been held up as a good example of a society that has achieved high levels of human development without the usually accompanied pursuit of increasing economic growth and incomes (Franke & Chasin, 1994; Jeffery, 1992; Panikar and Soman, 1984). This has been achieved by a long history of people's participation in a variety of socio-religious and political movements that shaped public policy towards achieving higher literacy, better health and nutrition and the accompanying increases in life expectancy. On a human development index criterion, Kerala State tops the states of India and is at par with many developed nations (Kannan, 1999). These comparisons, however, reflect the average situation. The point has been made that this "central tendency" hides the conditions of certain "outlier" communities which do not conform to these norms for

the important reason that they were not part of the mainstream socio-religious and political movements mentioned above. Their socio-economic conditions left much to be desired. The Christian and Muslim fishing communities in Kerala certainly fall into this group (Kurien, 1994). It is in response to this situation that social activists entered these communities three decades ago.

This close association with the fishing community became a great asset in my subsequent pursuits as an activist-researcher. I was able to closely investigate numerous issues pertaining to the political economy of fisheries development as well as various techno-economic and socio-cultural aspects - most often with the close cooperation of the communities themselves.

The contents of this paper are also based on the findings of my earlier published studies. What I examine here are the *visible manifestations* of deeper social and cultural attributes fashioned over a very long history. The list includes: the nature of the sharing patterns in the fishery; traditional knowledge and technology; the old and new institutional arrangements in fishing communities; the question of fish and food security; and the role of women.

I consider the above to be matters which have a more important bearing on the livelihood and food security of both the marine fishing communities of Kerala in particular, and its millions of avid fish consumers in general. I also consider these issues crucial to any future prescription for a just and participatory fisheries development and management which will augur well for both the resource and the people. The discussions on the issue of fish and food security issues as well as the role of women, extend to all the fish consuming households of Kerala and not just those in fishing communities.

1. SHARING PATTERNS

The socio-cultural embeddedness of the fish economy of Kerala is most evident when we examine the patterns adopted in the sharing of the fish harvest and the income derived from its sale. The share system in a fishery can be viewed merely as an efficient mechanism for spreading risks between capital and labour. What is often missed is that, inherent in these patterns of sharing, is a deeply instituted process of care and concern. This dimension also calls to question the implicit assumptions of the modern market society which has tended to institutionalise the motive of "gain and profit" as the principal reason for material interaction between human beings.

Fish Sharing Patterns

The fish sharing patterns in the artisanal fishery are very much conditioned by the fishing community's perspective of the fishery resource as a community property. Though only a small proportion of the fishing community is involved in the labour process to harvest the resource from the sea, the strong socio-cultural concern requires that the benefits accruing from it should be spread as widely as possible in the community which inhabit the fishing villages.

An important manifestation of this concern, is found on the beach landing centres at fishing villages. The first charge on fish brought ashore from a fishing trip is for those in the fishing communities who have no possibility to go to sea. These include persons such as widows, those physically and mentally handicapped, those temporarily or permanently maimed from accidents at sea and those who provide services to the community like the barber. This can be viewed as a built-in community care (social security) measure aimed at ensuring basic food and livelihood security.

Following this, the next priority is for the fish consumption needs of the crew and the shore workers attached to the fishing unit who help in launching and beaching the craft. Married women and girls who have not attained puberty, play an important role in ensuring that this practice continues by their presence at the beach landing centres to receive their husbands and fathers and take the fish home to cook. Estimates of the quantum of fish set aside in this manner to cater to the food security needs of the community work out to between 5 and 7 percent of the quantum of catch per fishing trip (Kurien and Willmann, 1982). Only after these two needs are met is the remainder of the fish sold to traders or taken to market.

Income Sharing Patterns

The fish that is put on sale is purchased by small-scale women and men fish distributors. They carry fish to market on their heads or by cycles and scooters. When landings are large wholesale merchants appear and then use lorries to move the fish out to markets. In either case, negotiation or auction determines the sale value. Depending on the terms, the payment is either made in full or part. In the Hindu and Christian communities the wives of the equipment owning fishermen play an important role in this process by taking charge of the cash and negotiating balances with the merchants. Their function as home fund managers is vital.

The distribution of the income from the sale of fish is undertaken after all the "common expenses" - those pertaining to the running expenses such as fuel, food costs, auctioning commissions etc - are deducted. This divisible income is first broadly apportioned into (i) an equipment share (return to capital) and (ii) a crew share (return to labour). The crew share is then divided in accordance with the number of crew, each getting an equal portion. If a particular crewmember - such as the skipper or out

board motor driver -- is entitled to a larger share, the crew contributes this by setting aside a portion from what is due to them. Alternatively, it is contributed by the owners of the equipment from the shares due to them. What is important to note is that these norms of division are situated in the context of communitarian livelihood norms composed of strong social and cultural mores that do not change as rapidly as technology.

The income sharing patterns therefore, tend to be "sticky" and biased towards providing adequate returns for labour. The *karanila* (shore status) system found in an important fishery of Kerala State is an illustrative example of how income sharing systems have evolved in the context of changes in production relations and technology, keeping community concerns for livelihood and nutritional security at centre-stage.

The *Karanila* System:
Its Contribution to Livelihood and Nutritional Security

The *karanila* system is practiced in the encircling-net fishery of Kerala State. It is located in the central coastal region in the Alapuzha District. This is also the region where the *chakara* phenomenon develops during the monsoon season yielding bumper harvests of oil sardines and prawns (See Kurien and Vijayan, 1995). This system ensures that the total number of fishermen present at the seashore and who "touch the craft" at the start of the fishing trip, are considered the crew of the respective unit *for that day*. From those present, the required number will get into the craft and go fishing. These will generally include the owners who are the permanent workers, and the group of "semi-permanent" workers who have no ownership stake but agree to work with a unit for a minimum period of one year. The remaining "temporary" worker-fishermen stay back on the shore. They are free to change units as and when they like. It is this group of temporary standby crew who is

granted *karanila* or "shore-status". The names of the working crew and the non-working crew are noted done by the accountant every day. Everytime a new temporary fisherman offers to work with the unit he has to join the working crew to prove his "seaworthiness." This practice precludes the possibility of persons unwilling or unable to work at sea from exploiting the *karanila* system.

The encircling-net pelagic resource fishery, where this system of *karanila* is practiced, was one of the most important of the artisanal fishing operations carried out in Kerala State. About half a century ago such encircling-net fishing units - each employing between 15 - 20 persons -- were owned by feudal landlords who held the workers as bonded labour. A peasant uprising in the region in the 1940s, known as the Punapra-Vyalar struggle, in which the bonded fishworkers played a major role, led to a revolutionary change. The uprising was motivated by the strong communist movement in the region that had been organising the workers in the coir factories and the tenant farmers in the agricultural areas (Kaimal, 1994; Jeffery, 1981; George, 1975). Some of the active leaders came from fishing villages and they intervened to help created a change in the production relations in the fishery. The fishworkers then formed groups and became the collective owner-operators of the units. The group sizes varied from 4 to 25 and kinship was the most usual basis for group formation. The transition from a feudal to a communitarian system of ownership thrust a moral responsibility on the new class of owner-workers to create mechanisms for income spreading. The fishery was implicitly deemed community property, and hence the wealth from it was intended for all. Both the rationale of providing fish for consumption to all and the *karanila* system are rooted in this socio-economic and cultural context.

Just as the transition to the collective ownership of the fishing units has come to stay, so also has the unquestioned custom of the *karanila* system along with it. The role of *karanila* fishermen in the fishery gains extra importance in two specific situations. When the size of the ownership group is small, the permanent and semi-permanent fishermen together are not sufficient to operate a fishing unit. *Karanil*a fishermen are crucial to the working of the unit is such a circumstance. Also, in the pelagic oil sardine and mackerel fishery, which is the mainstay of these encircling units, during the *chakara* season it becomes necessary and indeed lucrative to make more than a single trip during the day. In such situations there is a need for more than just the right number of crew to man a single trip. Having a large *karanila* fishermen group ensures work rotation so that each trip-team will get sufficient rest and recoup their energy for the next trip. The role of larger numbers in the quick and efficient handling of net repairs and in the launching and beaching of the unit need hardly be overemphasised. In a pelagic fishery, successful operations are importantly conditioned by good fishing gear and the diligence of those ashore responsible for its maintenance. The fact that the *karanila* fishermen are not "attached" to any particular unit has meant that when the fishing season is bad they are free to leave the unit and seek better income opportunities elsewhere. This means that there will be no undue social pressure to increase fishing effort during the natural lean fishing season. The *karanila* system consequently provided the basis for fuller work opportunities, and more importantly, for a spreading of income in the community. It ensured a fair degree of distributive justice so long as there was community control on the number of fishing units in the village and a good, stable fishery.

Prior to the 1980s the encircling-net fishery was a totally labour-intensive operation. Thereafter it gradually began to utilize out-board motors to power the craft. This allowed for a substantial increase in the

size of the net and the craft. The impetus for this came from the new phenomenon of state support for the artisanal fishery. It took the form of subsidies and credit facilities. The result was a spurt in the number of such new units entering the fishery. By 1991, it was estimated that about half the 120,000 active fishermen in the state were employed on these motorized encircling-net units now called ring-seines.

Unfortunately, this shift has resulted in an unrestrained growth in the number of ring-seines mainly due to state largesse. The ownership groups formed to take advantage of these incentives were often from outside the active fishing community. One crucial impact of this was that the erstwhile community control on the nature and level of investment in the fishery got substantially eroded. The spurt in investments resulted in a drop in catch rates. Following this many units left the fishery of the area and a large number of fishermen were left with no employment. Some worker fishermen switched back to non-motorized fishing units and others regrouped to form smaller ring-seine units. During this transition the *karanila* system faced its severest test. The units that remained were confronted with the situation of having more karanila fishermen than those working at sea. Even when the catches were good, the average income of the individual crew was depressed because of the customary claims of the *karanila* fishermen.

The *karanila* system was a recent custom-created mechanism (just over 50 years old) for ensuring an adequate supply of labour to the fluctuating needs of the fishery. It was also a system for income spreading. The *karanila* system has ensured that the nutritional status of a large number of persons has been taken into account. The "boom and bust" in the presently more heavily over-capitalized pelagic fishery combined with the breakdown of the community institutions of control of access to the resource, have threatened the continuance of the *karanila* system.

2. TRADITIONAL TECHNOLOGY AND KNOWLEDGE

The elaborate understanding of the nuances of the aquatic milieu and the behaviour patterns of living marine organisms are the quintessence of the traditional ecological knowledge system of the artisanal fisherfolk of Kerala. The technologies adopted by them to catch fish are a personification of this knowledge which in turn is handed down largely through learning-by-doing and oral traditions of songs, stories and sayings (See Kurien, 1998).

Technology

Diversity is the hallmark of artisanal fishing craft and gear technologies. The notable feature was that the investment in gear was far more important than the investment in craft. The diversity has been influenced primarily by two interrelated factors. First, the given and largely unchangeable nature-determined factors that pertain to tropical marine eco-systems. Importantly these include the strong element of seasonality in the fishery; the highly dispersed and interactive nature of fish species; and the non-homogeneous physical oceanographic conditions. Secondly, the exotic socio-cultural influences coming from the foreign countries with which Kerala had contact through trade as well as the colonial conquests that often accompanied trade. This is manifest in the unmistakable influence in the designs of traditional craft and gear. The dugout canoes of the northern region of Kerala where the Muslim fishermen dominate exhibit distinct Arab influences. The boat seines used by the Christian fishermen in Thiruvananthapuram district in the south are of Portuguese origin. The dip nets have been introduced by the Chinese and are called the *cheena vala* (Chinese net). The net result was development and use of fishing tools and techniques that were marked by their ecological sophistication but with inherent limits to their levels of productivity. The 600 kilometer coastline was distinguished

by at least 14 types of fishing crafts and at least 23 types of fishing gear (SIFFS, 1992). Artisanal fishing gears are largely marked by their diversity of fabrication, passivity in use, seasonality of operation and limitation in size. To be productive during the whole year a fishermen needed several gear types each suited to the specific specie to be caught during a specific season. Consequently, the catching capacity of the gear in their possession was normally higher than the actual annual harvest made. This "overcapacity" was an innate element of this sustainable artisanal fishery.

In Kerala, even as recent as 1980 there were as many as 22 major craft-gear combinations used by the artisanal fishermen to harvest the resources of the coastal waters (Kurien and Willmann, 1982). During this period they accounted for over 70 percent of the fish harvest of the state of about 400,000 tonnes. The mechanized trawler and purse-seine fleet took the remainder. The post-1980 introduction of out board motors onto the artisanal fleet had the effect of introducing new craft designs; reducing the gear diversity and the induction of more active, perennial fishing gear such as ring-seines into the artisanal fishery. Two decades of this experience has resulted in the new phenomenon of overcapitalization of a major segment of the artisanal fishery. It has also led to the excessive energy intensity of fishing operations making them economically unsustainable both for the large number of artisanal fishermen as well as the new entrants into the fishery. The ecological sustainability of these operations has also been questioned. The effect it has had in deskilling fishermen is yet to be assessed systematically though the general consensus among them supports this conclusion. One important effect of this has been a noticeable "switching back" to some of the erstwhile artisanal fishing gear and craft. This response is adequate demonstration of the solid techno-ecological and socio-cultural

foundations of the artisanal knowledge and technology being appropriate for fishing as a source of sustainable livelihood and food.

Knowledge

An artisanal fishing operation is not determined *a priori* by a process of inductive reasoning. Any particular fishing operation in progress is a simultaneous integration of large numbers of discrete thought processes of past experiences coupled with the immediate observations aided by all the human senses. These include *interalia*: the feel of the sea-bottom acquired by touching the plumb line; the smell of the sea; the sight of birds, the colour of the sea and the ripples on it; the sound of the shoal movement - to mention a few. The coming together of these aspects initiates the tool using response - dropping of hooks, casting of nets or laying of traps. The result: fish is soon caught (Kurien, 1987).

Artisanal fishermen can rarely make explicit any general "theory" of their fishing. We may infer that their "theory" is constructed from observation and tested by further observation. They add or subtract from "theory" by producing new explanations or dropping existing ones. The process defies verbalization in the form of general axioms on the practice of fishing. It is a cultural continuum of habituated practice stored in the memory and passed on to the next generation in the process of learning-by-doing. It is practical knowledge conditioned into cultural practices. It also represents their "world view" of "mother ocean" as a life-giving system rather than a hunting ground, with the living resources in it being "limitless" and their ability to *individually* bring ruin to it rather remote.

The holistic nature of their knowledge system can be best illustrated by the example of the venture by artisanal fishermen of the Thiruvananthapuram District in southern Kerala to construct *kritrima paar* -- artificial reefs (See Kurien, 1995). The knowledge about the

reef-sea-fish interactions had been passed down to them from the older generation and kept alive by their own practice of fishing over the natural reefs in the region. There was a holism about their understanding that stemmed from their concern with the whole resource system rather than just the fish in it.

Fishermen consider reefs as an important basis for ecosystem rejuvenation. This association is premised on their understanding that underwater structures in the sea cater to the *adisthana avasyangal* (basic needs) of fish: their need to feed; their strong desire for protection from predators; their requirement for rest and shade; and their urge to breed. Consequently, for an artificial reef to be a source of food to fish, the kind of materials used to build it gained importance. The materials used should be those on which benthic vegetation would aggregate quickly thereby ensuring adequate food supplies. The artificial reef needs to be erected in areas where the sea bottom is naturally productive. To serve the needs of protection, rest and shade for fish, the structure and the position of the artificial reef are determining factors. Only an artificial reef of sufficient height will provide shade. Solid structures are not conducive for protection and rest, as they do not provide hiding places from predators. If fish are to make artificial reefs their breeding grounds, then the prerequisite of food and protection become imperative. For fishermen to be able to catch the fish that use the artificial reef in such a wide variety of ways, the reef should be aligned on the seabed in the east-west direction. Given the north-south direction of the littoral current in the region, this is the best alignment to ensure that the maximum number of fishermen can fish over an artificial reef at any given time without getting their hooks entangled. They have also learned that artificial reefs should be located in the "fish channel" - a path which was identified as being between 25 and 50 meters in depth in the in-shore sea. Referring to the way this total understanding of fish behaviour helped to induce fish into

the artificial reefs, one fisherman remarked: " The fish teaches us and then we teach the fish (a lesson!)"

3. INSTITUTIONAL ARRANGEMENTS

There are several institutional arrangements in Kerala's marine fisheries that define access and conservation norms within the community. Some like the *kadakodi*, the "court of the sea", have long histories. Others, like the institutional innovations to manage the artificial reefs, are more recent in origin. These arrangements are basically communitarian in nature and are therefore embedded in the specific ecological, social and cultural context in which they have arisen. They have evolved in the process of the community's attempts to define the nature of their relationship with the sea and the living resources therein. The prime social foundation of these institutions is to ensure livelihood security through arrangements that ensure justice and fairness in an occupation that is highly risk prone and with considerable uncertainty of outcome.

The Court of the Sea

Among the Hindu fishing communities scattered in the predominantly Muslim dominated districts of Kozhikode, Kannur and Kasargode, there is the age-old traditional community institution called the "*kadakkodi*" or the "sea court" which is closely associated with the temples located on the beach. The region is known for it's near shore oil sardine and mackerel fishery which exhibits great seasonality and is marked by bumper harvests. The numerous artisanal fishing units involve large numbers of people undertaking hasty operations. Confusion and conflicts are inherent to the very nature of the fishery. The "court" consists of the "elders" and certain number of "functionaries" to implement the decisions. The court meets on the open beach. All the fishermen of the village gather to participate in the discussions on issues relating to access,

conservation and conflict resolution. The elders take the decisions and these are considered final. Monitoring the implementation of decisions taken is the responsibility of the whole community. The elders make sanctions against offenders. This can range from a mere warning to total social ostracism. Conflict resolution is also very cost effectively and amicably handled. Open, systematic procedures, quick decisions and effective implementation make this possible.

The *kadakkodi* institution has been subjected to considerable pressure from the early 1980s. This was primarily due to several factors. They include *interalia*: the rapid technological change in the fishing practices of the traditional fishing communities; the commencement of new organizational forms such as cooperatives promoted by the government; the new political divisions among fishing communities; and the greater involvement of formally educated youth in fishing operations. The authority of the elders was subjected to question, as other forms of leadership (e.g. in the cooperative, the political parties' etc) began to emerge both within and outside the community. The basic scaffolding of the *kadakodi* is still in place. Discussions with fishing communities in this region point to a latent interest in reviving the institution, albeit in a new form. The government of Kerala is placing a new emphasis on *panchayat* (village) level resource management and governance with total participation of the people (Government of Kerala, 1997). In this context, communities with a history of traditional institutions have an important edge in finding their feet in any new stewardship contract between state and community.

Institutions for Resource Rejuvenation

Most traditional institutions in artisanal fishing communities have revolved round issues of allocation, regulation and conservation that are today considered to be the core concerns of fisheries management. In

the context of resource depletion and ecosystem damages, the role of active community involvement in resource rejuvenation merits consideration. More recently, (as mentioned above in Section 2) the Christian fishermen in the Thiruvananthapuram District of Kerala had embarked on a venture to rejuvenate the resources of the coastal waters using artificial reefs. Being familiar with hook and line fishing, these fishermen are by far the most skilled and knowledgeable as regards the nuances of fish species and the sea. However, unlike the Hindu fishermen, the communitarian traditions that Christian fishermen may have practiced before their conversion (in the 16th century AD), have mostly been replaced by the religious traditions of the church in which fishery related issues have little role. There has thus been a vacuum in the realm of village based traditional fishery institutions. When these fishermen renewed their interest in erecting artificial reefs in the early 1980s, there was a lack of an appropriate institutional setting for achieving the task. Initially, private individuals filled this institutional vacuum. They seized the initiative and organized the erection of artificial reefs in the coastal sea by investing their own funds. Having erected the reefs, they accorded access to a limited number of persons from whom they hoped to collect an access rent. Within a short time, the difficulty of monitoring access led to the abandonment of these initiatives by the individuals. This failure created the basis for a more organized group initiative for erection of the reefs. Financial help for this came from external agencies like cooperatives and voluntary organizations. Access was limited to the members who had contributed funds for purchasing the materials to make the reefs. Regulating access to such reefs was seen as the collective task of the shareholders.

This "group erection-group access" arrangement held together well and fishing over these reefs proved viable. Strains developed when news of other, more communitarian forms of initiatives in the neighboring

southern coastal villages came to light. In these villages, fishermen adopted what they called the "*utsava shylee*" (festival approach). Village festivals are funded by collecting funds (in cash and kind) from all the households in the village on the basis of a "whatever-each-one-can-give-happily" approach. A core group (the festival committee) undertakes the actual initiative and hard work of organizing the festival. Their only gain is social recognition. Any numbers of volunteers are accommodated. The grandeur of the festival is proportionate to the total funds raised and the skill of the organizers. However, the access to the fun of the festival is open to all in the community irrespective of the quantum or nature of their contribution.

Inter-village discussions emphasized that extending the *utsava shylee* to reef erection and access was much closer to the cultural beliefs pertaining to the stewardship of the natural resources of the sea. These were deeply embedded in the psyche of the community. The "group erection and group access" approach promoted a certain narrow exclusiveness -- an attitude unbecoming both at a village festival and at sea. A self-critical review led to a quiet transition from a situation where villages communities took isolated decisions to a context where the pros and cons of seemingly appropriate decisions could be tested against the merits of the more rewarding and socio-culturally appropriate experiences of others. Communities formed *sahodara samajams* (brotherhood fraternity) in which one member from each of the fishermen households in the village were given membership. This was a means of formalizing total community participation in the venture. The *sahodara samajam* elected a "works committee" which would be responsible for erecting the reef, deciding on the norms/restrictions over access, and for settling conflicts should they arise. Every household made a financial contribution. This fund was matched by a matching grant from the church.

Technical assistance was sought from voluntary organizations with the required expertise.

This concerted evolution towards more community identification and concrete involvement in the erection and access to artificial reef point to the steady process of accretion of institutional social capital. The result has been the growing support for an institutional choice that spreads both the costs and the benefits more evenly within the community. Given the appropriate circumstances people who have a very intimate association with natural resources as a source of livelihood, can empower themselves to go beyond macro-level collective action for conserving resources to micro-level initiatives for improving and rejuvenating them.

The fish caught over artificial reefs can never contribute a significant share of the fish production in Kerala. However, they play an important role in keeping alive some of the socio-culturally-important informal welfare arrangements in artisanal fishing communities. The changes in the technology, the increased investment and operational costs of fishing have made the older active fishermen technologically and financially obsolescent. In this context, artificial reefs play the role of a "safety net" and living "pension fund" by providing a fishing spot close to shore. The lower productivity is compensated by the higher prices for the fresh fish. The reefs have doubled up as a training ground for younger members of the fishing community. Here they can learn the art of fishing and the secrets of the sea for the older generation. This ensures a cultural continuity of the knowledge system of these communities.

4. FISH AND FOOD SECURITY

The long history of exogenous cultural contacts has introduced to the people of Kerala a wide variety of foods. Today these are considered to be part of the traditional diet. However, it is the aquarian ecological

context of Kerala that has made its people avid fish eaters from time immemorial. As mentioned earlier, Kerala is the only state in India where even Hindu communities are avid consumers of marine fish. The staple diet of rice or tapioca (manioc) combined with oil sardines and served along with toddy (fermented tender coconut juice) is mentioned as the choicest offering to the gods in some Hindu temples.

It is recognized worldwide that food habits are among the most difficult of cultural aspects amenable to change. However, long term changes in the availability of a preferred food item can alter tastes. When the transformation of an economy does not come to terms with this fact, it can create situations that are difficult to resolve. In Kerala we have an interesting and instructive example of how domestic fish consumption preferences and taboos changed the whole direction of fisheries development. It relates to the history of shrimp exports from Kerala which was alluded to earlier. The plenitude of shrimp resources in Kerala's coastal waters was a well-known fact for centuries. These bottom dwelling animals came to the surface during the monsoon months and became particularly abundant during the *chakara* season when they became easy prey mainly to passive gill nets and encircling nets. Boiled and dried shrimp were a major export from Kerala to the east Asian countries and China where shrimp constituted an important part of the cuisine. This commerce was greatly facilitated by the fact that, in Kerala there were strong taboos against eating shrimp since it was associated with producing stomach disorders. Consequently, but for a very small domestic consumption, even as recent as the late 1950s, shrimp was either exported or used as manure for the coconut palms that formed Kerala's main cash crop at that time. Shrimp prices were well below the price of even small pelagic fish. This context made it easy for the enhanced demand for shrimp from the US and Japanese market in the early 1960s, coupled with the introduction of bottom trawl nets and freezing technology, to

create the most phenomenal and lucrative fishery export boom in Kerala. This changed the whole course of fisheries development in the state. The coastal waters became open access to investors who could afford the new harvesting and processing technologies. A small section of investors and business people became very rich during this "pink gold" rush. In a little over a decade, a sharp decline in fish harvests followed as a result of ecosystem damages caused by unregulated and excessive trawling for shrimp. The artisanal fishing communities who were marginalised in this process united in organized protest against the state for allowing this unbridled export growth and the entry of capitalist interests into the fishery (Kurien, 1992). Fish consumers in Kerala experienced a substantial decline in fish availability and a steep increase in fish price. Being the cheapest source of animal protein this trend had important implications for food security.

5. THE ROLE OF WOMEN

The role that women play in developing societies in preserving the social and cultural ethos can hardly be overemphasized. The onus of providing stable sustenance has been the lot of the womenfolk. While men usually work outside the home as the breadwinners, women are considered the homemakers even if circumstances and opportunities warrant that they work outside the home for a living. We will highlight the similar and the differing roles played by women in fishing households and women in the fish consumer households in Kerala. Both play crucial roles in livelihood and food security.

Women in Fishing Communities

Women play an indispensable role in maintaining the social and cultural foundations of the fishing communities in Kerala. In a multi-caste, multi-religious society these roles take varying socio-economic

and cultural expressions. One common and strong taboo relates to women's involvement in actual fishing. This is considered to be "polluting" and consequently women in the fishing households never go to sea. The closest they may get to it will be for gathering shells and cockles on seafronts with rocky fringes. The women of the Muslim Mappila fishing communities of the northern region are largely confined to their roles as mothers and providers of the basic needs of the family within the four walls of the home. Very gradually, with increasing education and greater socialisation they do involve, to a limited extent, in some post harvest activities in the villages (Mathur,1977). The Hindu Araya fisherfolk and the Christian Mukkuva fisherfolk permit their women to participate in the economic activities relating to the fish processing, buying and selling in distant markets (Ram, 1991).

These differences apart, it is well known that women are the homemakers in all the fishing communities. In all the three religious communities, women standing on the seashore, anxiously awaiting the return of their husbands from sea, is a common sight. As homemakers, women ensure that the fish for consumption and the money realized from the sale of the surplus is effectively managed for the good of the household. The men, whose occupation at sea, takes them away from mainstream society, have limited contacts with the world outside. Behind every successful fisherman stands a woman who is the anchor of the household. Many of the marine fishing communities in Kerala practice matrilocal family formations. This provides a greater stabilizing role for the women in the household and the economy. Since a fisherman spends much less "quality time" in his home when compared to farmers and other land-based occupational groups, the role of the woman, both in the socializing of the children and resolving the "cooperative-conflict" involved in the allocation of food in the household, becomes very significant (Dreze and Sen,1989). In Kerala, in households like those of

the fishing communities, which live close to subsistence levels, these roles are particularly important in ensuring nutritional security for the family. The evidence, however, points to the sad contradiction that in fishing communities there is a bias against the girl-child on both the counts of proper socializing and nutritional security (Kurien, 1994).

Among the Hindu and Christian fishing communities women often make the initial contacts with the outside world and the fishing village by taking fish to the markets. The women from these communities who interact with the market provide a strong socializing element to the family and have a significantly better understanding of the dynamics of societal forces. In the Muslim communities some of them get involved in the shore-based processing activities but rarely involve in gathering at sea or going to the markets. Modernization of the fishery has often been accompanied by a greater degree of concentration of the activity to big ports following the introduction of larger mechanized fishing craft. This move away from decentralized, village-based fishing has also deprived the women of many of their economic and social activities in the fish economy. It has also disrupted the shorter, less costly, more employment oriented, marketing chains which linked the small agglomerations of coastal fishing communities in Kerala to the widely dispersed rural consumers of the immediate hinterland. This has had a negative impact on the quantum of fish consumed by large numbers of these relatively poorer consumers.

Women in fishing communities also involve in the shore-based household and processing and net making activities. The former are crucial because these activities often depend on the fish which are taken as part of the share for household consumption or which may have been unsold when taken to the market. Such activities minimize the waste of fish. They also sometimes provide the earnings that are saved by the

women for use to buy food in the lean seasons. Many of them also seek wage employment in the commercial processing sector.

Women in Consumer Households

Women in the non-fishing consumer households play a different role. Irrespective of the economic status of the household, it is the women of Kerala who play the crucial role in cooking the food for the family. The traditional knowledge about food and diet are passed done through them from generation to generation from mother to daughter. Housewives' beliefs that prawns causing indigestion and stomach disorders, and oil sardines and anchovies are indispensable in the diets of children are examples of such wisdom (See Annex One for more examples). Women decide protein combinations in the diet and the manner in which these are cooked and served to the different members of the family. It is the mothers who decide what children should eat. These childhood diets condition the future demand. As mentioned above (see Section 4) there have been changes in the availability, prices levels and the quality of fish in the domestic market as a consequence of eco-system overfishing in the coastal waters of Kerala. This has played an important role in changing the food preferences of both the poor rural consumers in the state and caused a significant change in the protein preferences of the upper and middle-class consumers. In the latter consumer segment there was a sharp decline in the consumption of tapioca (manioc) which is always consumed in combination with a fish curry. The rising prices of fish have been singled out as a prime factor for this change. The richer consumers seem to have altered their protein preferences. This exhibited itself in the changing pattern of animal protein intake. Mothers in this consumer segment in Kerala were feeding children with more milk, eggs and chicken due to their easier availability and assured quality. With this the strong preference for fish exhibited by the adults of today and yesteryears is bound to wane.

SUMMARY AND CONCLUSIONS

If livelihood and food security is to become one of the goals of fisheries development and management practice in developing countries, then the social and cultural dimensions of fish consumption and fisheries must occupy a much higher priority than it does today in most fishery administrations. Fortunately, cultural norms and social mores do not change as technology. Being deeply embedded in the society, they can be revived if the proper effort and the collective will exist to take up such a project. Basically this implies a more people-centered approach to development. An approach that searches for the inner rationality of actions, as seen and understood by the participants: an *emics* mode of interpretation (Harris, 1980). In my experience, initially working with what the people already know well and do with ease, going by the cultural grain so to speak, nearly always seems better advised for small-scale fisheries. Change introduced thereafter, with their participation, is invariably adopted in more convivial and committed manner.

The objective of the "development decades" in most developing regions of the world was primarily geared to giving priority for achieving economic advancement through introducing major changes in technology and the organization of production. Enhancement of capital investment to raise natural resource production were at the centre of this paradigm; people and their social and cultural capital, accumulated over the centuries, were relegated to its periphery. Fisheries development in Kerala state in India was no exception in this. The social and cultural concomitants were seen as "drags" on this projected transformation of a traditional society into a modern one. The futility of this approach soon became apparent in the many failures of the techno-economic paradigm of development.

In Kerala the fishery is still, even literally, largely people-centered. There is more movement of the weight of humans than fish in the process of harvesting, processing and marketing. This should be viewed today as strength rather than a weakness of the sector. The more participatory a fishery is, the greater security for everybody. This is an important tenet for all population abundant countries where fishery resources are available.

Committed and systematic efforts need to be taken to incorporate social and cultural elements into both the discourse and praxis of management of the fishery resources. Key to this pursuit is the maintenance of diversity and the fostering of self-reliance. Both these are essentially values which run counter to the current tendency of homogenization through globalisation. To counter this macro tide will require the bolstering of the micro ripples at the level of family, community and nation. These initiatives can in turn be undertaken only when the livelihood and food security of the people is assured. In this paper, we have briefly touched on some of the outward manifestations of these deep roots. A summary of the inferences that emerge from our analytical description are sketched out below along with some related policy guidelines.

Inferences and Policy Guidelines

1. Sharing Patterns

The sharing patterns of fish and income are today under consideration stress. The overt commercialization of the fishery tends to rob it of certain built-in social security nets. Where these relate to the distribution of fish, it must be considered a prime part of the fishery's fixed overhead (Goodwin, 1990) to meet the food needs of the producers, their families and kinsmen and their neighbours who have at least an

ancillary participation in the fishery. With regard to income sharing we saw how the *karanila* system which was a direct fallout of challenging feudal relations, is now having to face the onslaught of capitalist relations. The redeeming feature is that the elements of community homogeneity and inter-dependence that were fostered by the *karanila* system are still deep-rooted in the social fabric of the fishing villages in Alapuzha. An important initiative, in any effort to revive the fundamentals of these earlier systems, will be to reassert the community property right to the coastal fishery. This must become the unalienable right of the active fishermen alone (Kurien, 1998). It is therefore, in principle, possible to restore to the fishery the principles of communitarian sharing and caring. To achieve this will require not just the collective will of the communities. The appropriate support from the state that is convinced about the socio-cultural rationality of such institutions in the management of the fishery for livelihood and nutritional security will be essential.

2. Technology and Knowledge

Fishermen in Kerala are confronted today with a considerably changed "universe" and in this context traditional knowledge and technology has its strengths and the weaknesses. However, there is potential for closer collaboration between artisanal fishermen and other personnel trained in modern scientific methods. Interactions between fishermen and marine biologists, oceanographers, craft and gear technologists point to the exciting possibilities of undertaking a "coevolutionary development process" (Norgaard, 1984). The use of motors and new material for nets are the major changes in technology. Even the use of a compass is still rare. One area where greater investigations are required pertains to obtaining an understanding about how fishermen acquire their holistic knowledge of the sea and the living resources in it. Blending of traditional and modern science and technology

can help to retain the decentralized, small-scale of operations and the vibrant technological diversity. This is an important need of the hour as it will help focus on how best coastal fisheries in tropical developing countries can first achieve the goals of sustainable livelihood and food at the locale, before all else.

3. Institutions

Institutions provide the backbone for the survival of socio-cultural norms and practices. They outlive generations and technological change. Despite some temporary set backs, endogenous institutional innovations of these fishing communities - both the old and the new -- merit serious attention. This is particularly so in Kerala state given the new context of collaborative arrangements between state and community for the management of the coastal fishery. The process of *panchayat* (village) level planning and governance initiated in Kerala provides a new basis for revival of such communitarian forms of rejuvenation of resources, regulation of access and resolution of conflicts arising therefrom (Government of Kerala, 1997). Institutions represent embodied social capital. Hiking up the interest on this provides an easier course of action than creating totally new capital.

4. Fish and Food Security

Fish is a major endogenous symbol of the culture of food in Kerala. It is also a major nutritional mainstay in the diet of its population, irrespective of their income levels, religion or social background. Its role in the food security of all the different cultural and economic segments of the domestic consumers in Kerala is indisputable. The history of fisheries in Kerala shows that modern fisheries development policies did not explicitly recognize this fact when venturing to promote an export-led growth of the sector. This is not to deny the importance of international

trade for the livelihood security of fishing communities. However, such policies can have rather short lived gains even for fishing communities if the choice of technology and the specification of access rights to the fishery are left entirely to the dictates of the "free market". There is a need to consider how the larger societal concerns for food security can be factored into sectoral development policies. In the context of Kerala, where fishing communities are at the lower end of the economic ladder and fish forms an important component of the food basket of all economic groups in the society, a fresh look into ways and means of optimizing benefits is essential. Innovative forms of social control over the fish export sector in order to curb its anarchic expansion will be desirable.

5. Role of Women

The role of women in fishing communities and fish consuming households is indispensable. Their decisions have a crucial bearing on both the nature and direction which livelihood and food security will take into the future. In fishing communities this will in large measure hinge on strengthening the still vibrant decentralized, village-based, small-scale fishing activities. In the Hindu and Christian fishing communities these provide an important impetus for revival of the role of women in the value addition to fishery products both in the realm of processing and marketing. This in turn provides the basis for re-establishing the link between fish harvesting, processing and marketing *by* the masses, with fish consumption *for* the masses. There is thus the need to highlight the relationship between decentralized, small-scale fisheries and food security of the poorer fish consumers. In the consumer households, women need to be made aware of the value of fish as a wholesome health food and not just another source of protein. An investigation of the scientific soundness of the fish preferences and taboos merits attention.

ENDNOTE

As an endnote I would add that social and cultural aspects of the fish economy are often not obvious to the casual observer. Even the experts have failed to perceive them. Among those who did, many could not appreciate their true significance. The renewed awareness of the need to factor in socio-cultural concerns in our pursuit for wholesome and sustainable development warrants the conscious search for discovering, understanding and building upon them. The aspects that pertain to livelihood and food security provide the foundation on which the rest of the superstructure can be built. If this enterprise is to have a lasting impact, the search and the construction of a new framework must be participative and involve all the stakeholders. Facilitating this should be an important new role for fishery administrators and managers.

ANNEX ONE

Housewives' Wisdom

Culturally Conditioned Fish Preferences and Taboos in Kerala State*

Taboos

- Consuming small prawns causes indigestion, stomach disorders and cholera
- Don't drink milk after eating prawns
- Fish should be cooked with black tamarind
- Fish and lime should not be eaten in combination
- Fish and bitter gourd should not be eaten in combination
- Yogurt and fish should not be consumed together
- Mushrooms and fish don't go together
- Fish should not be eaten together with sprouted grains
- Fish should not be consumed when taking certain ayurvedic (Indian system of medicine) drugs
- Fish with scales should be avoided by those with kidney stone
- Mackerels are known produce allergies like tongue and body itch
- Fish should be given to babies only after they are six months old
- Eating fish aggravates the formation of phlegm
- Fish from the waters in the hills and forests where sunlight does not penetrate should not be eaten

Preferences

- Bony ribbon fish is good for pregnant women
- Pregnant women should not use cuttle fish and silvery ribbon fish
- Anchovies and ray fish are good for women after delivery
- Anchovies and silver belly are fat free fish and good for people who are ill
- Shark flesh is good for those who suffer from piles
- Shark is good for those with arthritis
- Three essential foods for children over one: oil sardines, honey and milk
- The mackerel head is fit to be served to best guest.
- Fish is best cooked with black tamarind

* (The assistance of Mariamma Thomas, Geetha Devi and Lizzy Thomas in compiling this annex is gratefully acknowledged)

REFERENCES

Arasaratnam, Sinnappah (1994) **Maritime India in the Seventeenth Century**, Oxford University Press, Oxford

Chaitanya, Krishna (1994) **Kerala**, National Book Trust, New Delhi

Curtin, Philip D (1984) **Cross-cultural Trade in World History**, Cambridge University Press, Cambridge

Day, Francis (1865) **Fishes of Malabar**, Bernard Quaritch, London

Dreze, J and Sen A (1989) **Hunger and Public Action**, Oxford University Press, Oxford

Franke, R & Chasin B (1994) **Kerala: Radical Reform as Development in an Indian State**, IFDP Publication, California

Gadgil, M et al (1993) "Indigenous Knowledge for Biodiversity Conservation", *Ambio* 22(2-3) 151-158

Galtung, Johan (1974) "Technology and Dependence: The Internal Logic of Excessive Modernisation in a Fisheries Project in Kerala", *CERES*, September-October

George, KC (1975) **Immortal Punnapra-Vayalar**, People's Publishing House, New Delhi

Goodwin, James (1990) **Crisis in the Fisheries: People, Policies and Prospects**, Cambridge University Press, Cambridge

Government of India (1996) **Handbook on Fisheries Statistics 1996,** Ministry of Agriculture, New Delhi

Government of Kerala (1983) **Facts and Figures on Kerala's Fisheries,** Department of Fisheries, Government Press Thiruvananthapuram

Government of Kerala (1997) "Task Force Report on the Livelihood Security of Fishing Communities", Government Press, Thiruvananthapuram

Harris, Marvin (1980) **Culture, People, Nature: An Introduction to General Anthropology**, Harper & Row, New York

Jeffrey, Robin (1980) "India's Working Class Revolt: Punnapra-Vayalar and the Communist "Conspiracy" of 1946", *The Indian Economic and Social History Review*, Vol 18 No 2

----------(1992) **Politics, Women and Well-Being: How Kerala Became a "Model**", Macmillan, London

Kaimal, PKV (1994) **Revolt of the Oppressed:Punnapra-Vayalar 1946,** Konarak Publishers, New Delhi

Kannan, KP (1999) "Poverty Alleviation as Advancing Basic Human Capabilities: Kerala's Achievements Compared" *Working Paper No 294*, Centre for Development Studies, Thiruvananthapuram

Klausen, Arne (1968) **Kerala Fishermen and the Indo-Norwegian Pilot Project,** International Peace Research Institute, Oslo

Kurien, John (1985) "Technical Assistance Projects and Socio-Economic Change: The Norwegian Intervention in Kerala's Fisheries Development Experience", *Economic and Political Weekly*, Vol 20, No 25/26

----------(1987) "Knowledge Systems and Fishery Resource Decline: A Historical Perspective" In Lenz W and Deacon E (eds.) **Ocean Sciences: Their History and Relation to Man** (Proceedings of the IV History of Oceanography Congress), Deutsche Hydrographische, Zeitschrift, Hamburg

----------(1992) "Ruining the Commons and Responses of the Commoners: Coastal Overfishing and Fishworkers' Actions in Kerala State, India" , In Ghai D and Vivian JM eds., **Grassroots Envi-**

ronmental Action: People's Participation in Sustainable Development, Routledge, London

----------(1994) "The Kerala Model: Its Central Tendency and the Outliers", *Social Scientist* Vol. 23 No 1-3

----------(1995) "Collective Action for Common Property Resource Rejuvenation: The Case of People's Artificial Reefs in Kerala State, India", *Human Organisation* Vol. 54, No 2

----------(1997) "Traditional Ecological Knowledge and Ecosystem Sustainability: New meaning to Asian Coastal Proverbs", *Ecological Applications* Vol. 8 No 1 (Supplement)

----------(1998) **Property Rights, Resource Management and Governance: Crafting An Institutional Framework for Global Marine Fisheries,** CDS-SIFFS Publication, Chennai

Kurien, John and Vijayan AJ (1995) "Income Spreading Mechanisms in Common Property Resources: The Karanila System in Kerala's Fishery", *Economic and Political Weekly*, Vol. 30, No 28

Kurien, John and Willmann Rolf (1982) **The Costs and Earnings of Artisanal and Mechanized Fisheries of Kerala State,** FAO/ UNPD/BOBP Publication, Madras

Mathur, PRG (1977) **Mappila Fisherfolk of Kerala**, Kerala Historical Society Publications, Trivandrum

Norgaard ,R B (1983) "Co-evolutionary Development Potential", *Land Economics* Vol. 60 No 2

Panikar, PGK and Soman CR (1984) **Health Status of Kerala: Paradox of Economic Backwardness and Health Development**, Centre for Development Studies, Thiruvananthapuram

Pillai, MS & Ludden DE (1997) **Kuruntokai: An Anthology of Classical Tamil Love Poetry,** International Institute of Tamil Studies, Chennai

Ram, Kalpana (1991) **Mukkuvar Women:Gender, Hegemony and Capitalist Transformation in a South Indian Fishing Community,** Zed, London

Ray, Himanshu P (1994) **The Winds of Change: Buddhism and the Maritime Links of Early South Asia**, Oxford University Press, New Delhi

SIFFS, (South Indian Federation of Fishermen Societies) (1992) **A Census of the Artisanal Marine Fishing Fleet of Kerala State,** SIFFS Publications, Thiruvananthapuram

Srivastava ,UK et al (1991) **Fishery Sector of India,** Oxford &IBH Publishing Co., New Delhi

Velu, Pillai T K (1940) **The Travancore State Manual** Vol. III, Government Press, Thiruvananthapuram

CENTRE FOR DEVELOPMENT STUDIES
LIST OF WORKING PAPERS

(From 1991 onwards)

MRIDUL EAPEN Hantex: An Economic Appraisal.
September, 1991, W.P.242

SUNIL MANI Government Intervention in Commercial Crop Development: A Case of Flue Cured Virginia Tobacco.
November, 1991, W.P.243

K. PUSHPANGADAN Wage Determination in a Casual Labour Market: The Case Study of Paddy Field Labour in Kerala.
January, 1992, W.P.244

K.N. NAIR & S.P. PADHI Dynamics of Land Distribution: An Alternative Approach and Analysis with Reference to Kerala.
January, 1992, W.P.245

THOMAS ISAAC Estimates of External Trade Flows of Kerala - 1975-76 and 1980-81.
March, 1992, W.P.246

THOMAS ISAAC, RAM MANOHAR REDDY, NATA DUVVURRY Regional Terms of Trade for the State of Kerala.
March, 1992, W.P.247

P. MOHANAN PILLAI Constraints on the Diffusion of Innovations in Kerala: A Case Study of Smokeless Chulas.
March, 1992, W.P.248

R. ANANDRAJ Cyclicality in Industrial Growth in India: An Exploratory Analysis.
April, 1992, W.P.249

T.M. THOMAS ISAAC, RAM MANOHAR REDDY, NATA DUVVURY Balance of Trade, Remittance and Net Capital Flows: An Analysis of Economic Development in Kerala since independence.
October, 1992, W.P.250

M. KABIR, T.N. KRISHNAN Social Intermediation and Health Transition: Lessons from Kerala,
October, 1992, W.P.251

SUNIL MANI, P. NANDAKUMAR Aggregate Net Financial Flows to India: The Relative Importance of Private Loan vis-a-vis Foreign Direct Investments.
August, 1993, W.P.252

PULAPRE BALAKRISHNAN Rationale and the Result of the Current Stabilisation Programme.
November, 1993, W.P.253

K.K. SUBRAHMANIAN, P. MOHANAN PILLAI Modern Small Industry in Kerala: A Review of Structural Change and Growth Performance.
January, 1994, W.P.254

DILIP M.MENON Becoming Hindu and Muslim : Identity and Conflict in Malabar 1900-1936.
January, 1994, W.P.255

D. NARAYANA Government Intervention in Commodity Trade: An Analysis of the Coffee Trade in India.
January, 1994, W.P.256

K.J. JOSEPH, P. NANDAKUMAR On the Determinants of Current Account Deficits: A Comparative Analysis of India, China and South Korea.
January, 1994, W.P.257

K.K. SUBRAHMANIAN, K.J. JOSEPH Foreign Control and Export Intensity of Firms in Indian Industry.
February, 1994, W.P.258

PULAPRE BALAKRISHNAN, K. PUSHPANGADAN Total Factor Productivity Growth in Indian Manufacturing - A Fresh Look.
April 1994, W.P.259

D. NARAYANA, K.N. NAIR Role of the Leading Input in Shaping Institutions: Tendency in the Context of Irrigation Uncertainty.
May, 1994, W.P.260

G. MURUGAN, K. PUSHPANGADAN Pricing of Drinking Water: An Application of Coase Two-part Tariff.
December, 1994 W.P.261

MOHANAN PILLAI On the Mexican Crisis.
December, 1995, W.P.262

SUNIL MANI Financing Domestic Technology Development through the Venture Capital Route.
December, 1995, W.P.263

T.T. SREEKUMAR Peasants and Formal Credit in Thiruvithamcore: The State Institutions and Social Structure 1914-1940.
December, 1995 W.P.264

AMITABH Estimation of the Affordability of Land for Housing Purposes in Lucknow City, Uttar Pradesh (India): 1970-1990.
March, 1996. W.P.265

K. PUSHPANGADAN, G. MURUGAN, K. NAVANEETHAM Travel Time, User Rate & Cost of Supply: Drinking Water in Kerala, India:
June 1996. W.P.266

K.J. JOSEPH Structural Adjustment in India: A Survey of Recent Studies & Issues for Further Research,
June 1996 W.P.267

D. NARAYANA Asian Fertility Transition: Is Gender Equity in Formal Occupations an Explanatory Factor?
October, 1996 W.P.268

D. NARAYANA, SAIKAT SINHAROY Import and Domestic Production of Capital Goods from Substitution to Complementarity,
October 1996. W.P.269

NEW SERIES

W.P. 270 **ACHIN CHAKRABORTY** *On the Possibility of a Weighting System for Functionings* December 1996

W.P. 271 **SRIJIT MISHRA** *Production and Grain Drain in two inland Regions of Orissa* December 1996

W.P. 272 **SUNIL MANI** *Divestment and Public Sector Enterprise Reforms, Indian Experience Since 1991* February 1997

W.P. 273 **ROBERT E. EVENSON, K.J. JOSEPH** *Foreign Technology Licensing in Indian Industry : An econometric analysis of the choice of partners, terms of contract and the effect on licensees' performance* March 1997

W.P. 274 **K. PUSHPANGADAN, G. MURUGAN** *User Financing & Collective action: Relevance sustainable Rural water supply in India.* March 1997.

W.P. 275 **G. OMKARNATH** *Capabilities and the process of Development* March 1997

W. P. 276 **V. SANTHAKUMAR** *Institutional Lock-in in Natural Resource Management: The Case of Water Resources in Kerala,* April 1997.

W. P. 277 **PRADEEP KUMAR PANDA** *Living Arrangements of the Elderly in Rural Orissa,* May 1997.

W. P. 278 **PRADEEP KUMAR PANDA** *The Effects of Safe Drinking Water and Sanitation on Diarrhoeal Diseases Among Children in Rural Orissa,* May 1997.

W.P. 279 **U.S. MISRA, MALA RAMANATHAN, S. IRUDAYA RAJAN** Induced Abortion Potential Among Indian Women, August 1997.

W.P. 280 **PRADEEP KUMAR PANDA** *Female Headship, Poverty and Child Welfare : A Study of Rural Orissa, India,* August 1997.

W.P. 281 **SUNIL MANI** *Government Intervention in Industrial R & D, Some Lessons from the International Experience for India,* August 1997.

W.P. 282 **S. IRUDAYA RAJAN, K. C. ZACHARIAH** *Long Term Implications of Low Fertility in Kerala,* October 1997.

W.P. 283 **INDRANI CHAKRABORTY** *Living Standard and Economic Growth: A fresh Look at the Relationship Through the Non-Parametric Approach,* October 1997.

W.P. 284 **K. P. KANNAN** *Political Economy of Labour and Development in Kerala,* January 1998.

W.P. 285 **V. SANTHAKUMAR** *Inefficiency and Institutional Issues in the Provision of Merit Goods,* February 1998.

W.P. 286 **ACHIN CHAKRABORTY** *The Irrelevance of Methodology and the Art of the Possible : Reading Sen and Hirschman,* February 1998.

W.P. 287 **K. PUSHPANGADAN, G. MURUGAN** *Pricing with Changing Welfare Criterion: An Application of Ramsey- Wilson Model to Urban Water Supply,* March 1998.

W.P. 288 **S. SUDHA, S. IRUDAYA RAJAN** *Intensifying Masculinity of Sex Ratios in India : New Evidence 1981-1991,* May 1998.

W.P. 289 **JOHN KURIEN** *Small Scale Fisheries in the Context of Globalisation,* October 1998.

W.P. 290 **CHRISTOPHE Z. GUILMOTO, S. IRUDAYA RAJAN** *Regional Heterogeneity and Fertility Behaviour in India,* November 1998.

W.P. 291 **P. K. MICHAEL THARAKAN** *Coffee, Tea or Pepper? Factors Affecting Choice of Crops by Agro-Entrepreneurs in Nineteenth Century South-West India*, November 1998

W.P. 292 **PRADEEP KUMAR PANDA** *Poverty and young Women's Employment: Linkages in Kerala*, February, 1999.

W.P. 293 **MRIDUL EAPEN** *Economic Diversification In Kerala : A Spatial Analysis*, April, 1999.

W.P. 294 **K. P. KANNAN** *Poverty Alleviation as Advancing Basic Human Capabilities: Kerala's Achievements Compared*, May, 1999.

W.P. 295 **N. SHANTA AND J. DENNIS RAJA KUMAR** *Corporate Statistics: The Missing Numbers*, May, 1999.

W.P. 296 **P.K. MICHAEL THARAKAN AND K. NAVANEETHAM** *Population Projection and Policy Implications for Education:A Discussion with Reference to Kerala*, July, 1999.

W.P. 297 **K.C. ZACHARIAH, E. T. MATHEW, S. IRUDAYA RAJAN** *Impact of Migration on Kerala's Economy and Society*, July, 1999.

W.P. 298 **D. NARAYANA, K. K. HARI KURUP,** *Decentralisation of the Health Care Sector in Kerala : Some Issues*, January, 2000.