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Artisanal Marine Fisherfolk of Orissa

Edited by **U TIETZE**



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ARTISANAL MARINE FISHERFOLK OF ORISSA

ARTISANAL MARINE FISHERFOLK OF ORISSA

Study of Their Technology, Economic Status,
Social Organization and Cognitive Patterns

Includes

**an Annotated Bibliography on
Artisanal Marine Fisheries in India**

**Edited by
U. TIETZE**

VIDYAPURI

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CHAPTER I

Introduction

by U. Tietze

A well-known travel guide to India says : if you know Orissa, you can say that you know India. In a capsule form Orissa contains all the major features of the sub-continent, 'from industrialized India, through the India of the splendid Hindu temple architecture, to ancient India as the cradle of Hinduism and Buddhism, back to the India of the tribes, still living in the hunting stage of civilization.

Similarly, the traditional sea-fishing communities of Orissa, living for ages on the shores of the Bay of Bengal, reflect in miniature the lifestyle and material culture of the fisherfolk of the entire east coast of India.

Orissa's southern coastline has wide sandy beaches and surf-beaten shores which are also typical of South India. Its northern coast is characterized by rivers and creeks as well as extended tidal areas which are typical of the northern part of the Bay of Bengal with the extensive delta formed by the Ganges and the Brahmaputra.

The continental shelf off the southern coast is narrow, similar to the shelf off the coast of Tamil Nadu and Andhra Pradesh, while the continental shelf in North Orissa is wide, forming a part of the shallow continental shelf off Bengal. The marine environment of North Orissa differs from that of South Orissa and so do the fisherfolk and the technology they practise.

The artisanal fisheries sector in India plays an important economic role with regard to supply of protein, employment and even earning of foreign exchange. The present significance of artisanal fisheries in India is known by the fact that 59 % of the total marine catch of the East Coast States/Territories of Tamil Nadu, Pondicherry, Andhra Pradesh and Orissa (CMFRI 1982) is contributed by the artisanal marine fisherfolk.

Therefore, much developmental effort is directed towards this community by national as well as international agencies.

The study presented in this book was conducted as part of the developmental activities undertaken by the Project for the Development of Small-Scale Fisheries in the Bay of Bengal Project (BOBP) which is executed by the Food and Agriculture Organisation of the United Nations (FAO) and funded by the Swedish International Development Authority (SIDA). Since 1977 the Bay of Bengal Project has been demonstrating new technologies and methodologies in the fields of fishing methods, craft and gear, coastal aquaculture, extension services and community development to artisanal and other small-scale fisherfolk in the countries bordering the Bay of Bengal. One of the activities of the project is an in-service training scheme for officers of a newly established marine extension service for small-scale fisheries.

The in-service training was confined to three pilot projects: improvement of the traditional craft and gear, the introduction of credit schemes by coastal banks for artisanal marine fisheries and the development of a non-formal primary school curriculum for fishermen's children.

While this work was being carried out, it was found that **very little** was known about the lifestyle, customs and attitudes of the fisherfolk. The literature on marine fisherfolk is not rich but a few studies have been published on fisherfolk in India and other Asian countries.

Studies carried out on fishing communities in the Asian countries were either ethnographic descriptions-Trobian Islanders

by Malinowski (1941) and Andaman Islanders by Ratcliff Brown (1948) or described fishing communities as part of peasant communities-Firth's study on Malay fisherfolk (1946), Ward on Chinese fisherfolk in Hong Kong (1965) and Fraser Junior's study on Malay fishing villages (1962).

The earliest study of the marine fishing communities of India was Moses's ethnographic report on the Valayans of Madras (1929). Later came Ahmed's census monograph on a marine fishing community in Orissa (1961). Ethnographic descriptions of the basic social and economic features of sea fishing communities followed. Trivedi wrote on the marine fisherfolk of Kerala (1967), Punekar on the Son Kolis of Bombay (1969) and Suryanarayana comparatively on three fishing communities of Andhra Pradesh (1977).

Other studies such as those by Blake (1972) and Norr (1972), which are both on the artisanal marine fisherfolk community of Pattinavars of Madras in Tamil Nadu, concentrate on more specific and limited research problems. Blake studies technological changes, while Norr compares traditional marine fisherfolk with peasant communities.

Of the recent studies, Mathur's study of the fishermen of Kerala (1978) and B. Raychaudhuri's study of Jambudweep of West Bengal (1980) are in-depth studies of marine fisherfolk. They analyse technology, economy, social organization, rituals, knowledge of the ecosystem and world views of the fisherfolk.

The study presented in this book covers to a certain extent aspects similar to those covered in the recent studies mentioned above. But its approach and emphasis differ. While earlier studies have been micro-level studies of single villages and **single** communities, the study presented here is a macro-level study, comparing different groups/strata of fisherfolk and thereby using quantitative-analytical methods to a larger extent than the earlier studies. It aims at throwing more light on habitation, traditional caste occupation, differences in occupational and economic status and their significance, family structure, socialization of children, religious culture and customs, views and perceptions of nature,

trade and future and last but not least on artisanal *fishing* methods, technologies and operational patterns.

Furthermore, the study examines what role traditional caste occupation plays with regard to present occupational and economic status and various aspects of social interaction and attitudes. This is done by comparing those who are fisherfolk by caste with those who are fisherfolk by occupation only to show the process of and problems related to occupational mobility in the case of small-scale marine fisheries. Next we shall analyse the influence of economic status on various aspects of life, such as standard of living and education of children. An answer to these questions, is in fact vital to developmental activities which are based on the assumption that a higher economic status in terms of ownership of fishing technology leads to improvement of the living conditions of the target group. We shall also analyse to what extent economic stratification has taken place and whether economic status has become a major criterion of social stratification in the traditional communities of artisanal marine fisherfolk.

Prior to the sociological study, two pilot surveys were carried out. One was a qualitative study of the various types of artisanal fishing craft and gear and was undertaken in 36 major landing sites (Mohapatra 1985). The other, a techno-demographic census of the entire artisanal marine fisheries of Orissa, was undertaken covering all 236 coastal fishing villages (Kalavathy/Tietze 1985).

The census shows that there are 16,886 households of artisanal marine fisherfolk in Orissa and 30,050 active seagoing fishermen. Balasore district bordering West Bengal in the north is exclusively inhabited by Oriya and immigrant Bengali fisherfolk and has by far the largest number of fishing villages (184) as well as the largest number of fisherfolk (9260). Ganjam district situated on the border of Andhra Pradesh in the South has 29 fishing villages and 4132 fisherfolk households, which are almost exclusively of Telugu origin. Puri and Cuttack districts

inhabited by both Oriya/Bengali and Telugu fisherfolk have 1808 and 1686 marine fisherfolk households living in 16 and 7 villages respectively.

For the sociological study 10 villages were selected. In selecting the villages, remoteness/proximity to a town has been considered a strong factor with regard to the areas under survey and was therefore taken into account. Half of the villages chosen were comparatively close to a town, while the other half had a remote location. Furthermore, ethnic background as well as regional aspects in terms of occupational, cultural and migration patterns were taken as criteria for selection of villages. Out of the ten villages selected for the sociological study, four were situated in Ganjam district and six in Balasore district, Balasore and Ganjam districts were selected for the study because they represent all the major oceanographic conditions prevailing in Orissa as well as the various ethnic groups involved in sea-fishing.

While the villages selected in Ganjam district are exclusively inhabited by fisherfolk of Tetugu origin, the villages in Balasore district are inhabited by both Oriya and Bengali fisherfolk.

Again in each village, households were selected as second stage sample units, considering all economic strata equally. In South Orissa, owners of several craft and gear, small owners and wage/share labourers have been distinguished : in North Orissa, boat owners/boat and net owners, net owners and wage/share labourers-because of differences in ownership and operational patterns,

villages as well as households were selected with the help of fisheries extension officers. Apart from the criteria mentioned above, the familiarity of the fisheries extension officer with villages and households was also taken into consideration in order to maximise the responsiveness/frankness of the villagers as well as the opportunities for counterchecks. In total, 248 households (approximately 25 per village) were selected, out of which 84 belonged to the labourer category', 82 to the 'small boat and net owner' category in the South or 'net owner' category in the North, and another 82 to the 'big boat and net owner' category in the South or 'boat owner' category in the North. Out of the 248

households, 86 were of Telugu origin while the other 162 were Oriya and Bengali fisherfolk.

A combination of interviews and observations was used to collect information on the village. With the help of a schedule, containing both structured and unstructured questions, the head of the family and his wife were interviewed separately, by a team consisting of a female and a male investigator in order to counter-check and to compare perceptions expressed by male and female respondents.

The interviews were carried out in each village for a week. During this time, observations were made to obtain general information about the village and secondary information with regard to the areas covered in the interviews.

Further enquiries and observations were made during subsequent visits to several villages. The field survey was carried out by three teams of investigators, of which two consisted of sociology **and** anthropology students of Utkal University, Bhubaneswar, and one was formed by social science students **from** Madras University.

Chapters 2 and 3 of this book, in a descriptive way, compare the Oriya and Bengali fisherfolk of North Orissa with the Telugu fisherfolk of South Orissa regarding their ethnographic background, culture, fishing technology, perceptions of nature, economic and social organisation. Chapters 4 and 5, in a more analytical way, discuss the role and significance of traditional caste occupation and economic status by comparing fisherfolk of different economic status and fisherfolk by caste with non-caste fisherfolk.

It **is** hoped that the study will help to bring about a better understanding of artisanal fisherfolk and thereby provide information to make developmental efforts more meaningful for a community which en-gages in a strenuous occupation to feed society, sometimes with little reward for itself.

A shortcoming of the study is that more time should have **been** allotted for observations in order to gain a deeper understanding of the meaning and context of many of the aspects discussed in the following chapters. It is suggested that future studies take some of our findings **as** hypothesis or assumptions to be examined with the help of more thoroughly conducted observations and indepth interviews,

Fishing Technology and Fishermen's Perception of their Marine Environment

by C. Cunningham/P. Mohapatra/U. Tietze

The following chapter describes the different types of fishing gear and craft that are presently used by artisanal fishermen and attempts to explain how they are adapted to the ecological conditions prevailing in different parts of Orissa.

The social and economic factors related to fishing technology such as distribution of income and ownership patterns will be discussed, and sharing systems described, in Chapter 4.

Furthermore, the ways in which the increased demand for fish in India as well as abroad, the transition of the basically subsistence-oriented traditional fishing economy into a market-oriented economy, and the availability of new materials for manufacture of fishing craft and gear have affected **artisanal** fishing technology, will be examined. Finally the chapter discusses the present distribution of artisanal fishing craft and gear in Orissa and summarizes the present stage of development.

2.1 Marine Environment

The moderate climate of Orissa consists of three seasons: summer from March to May, rainy season from June to September, sometimes prolonged to November, and a winter season 'from December to February,

There are two monsoons, the active south-west monsoon during June-September and the weak north-east monsoon in November. The south-west monsoon contributes 90% of the annual rainfall and the north-east monsoon 10%, which averages about 148 cm.

Orissa's coastal area is cyclone-prone and is worst affected by cyclones and floods during the south-west monsoon. Cyclones may also occur in May and in the inter-monsoonal period.

As elsewhere in the Bay of Bengal along the east coast of India, two major currents prevail throughout the year : a north-easterly current flows during the period January to July and a south-westerly current flows during the period August to December.¹

The continental shelf upto 200m depth covers an area of 2500 km² which is 4.5% of the total area of the Indian continental shelf. In the northern part of Orissa, the continental shelf extends upto 120 km: in the southern part, upto 40 km.

While the southern coastline has sandy beaches and open surf-beaten shores, the northern coastline is characterized by rivers and estuaries and an extended tidal area.

The demersal fisheries potential (exploitable fish stock) in the continental shelf of Orissa has been estimated at 100,000 to 120,000 tonnes of fish by the Indian Institute of Foreign Trade. Out of the total, 30,000 tonnes are expected within the 10 fathoms zone, another 30,000 tonnes between 10 and 40 fathoms and the balance 60,000 tonnes between 40 and 100 fathoms. The pelagic resources which are the economically more important ones for artisanal marine fisheries are not yet quantified, neither are the deeper areas of the continental shelf.²

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1. A description of the major oceanographic and geological features of the Bay of Bengal is given by Fairbridge (1966) p. 110
 2. The current knowledge of fisheries resource% in the shelf area of the Bay of Bengal is summarized by Raja (1982)

The differences in the ecological and oceanographical conditions between the north and the south are related to the occurrence of different species of fish forming the economically most important artisanal fisheries in both parts of Orissa. While the major artisanal fisheries in the south are for sardines, anchovies, mackerels, seer fishes and prawns, the major fisheries in the north are for hilsa and pomfret.

Other abundant but economically less important species in both north and south are catfishes, elasmobranchs, sciaenids, polynemids and ribbon fishes.

2.2. Fishing Gear and Methods

Fishing gear and methods used in different areas in Orissa reflect the environmental conditions.

In the extended shallow shelf areas off Balasore coast, encircling nets and inshore seines are operated. The river mouths and estuaries of Cuttack and Balasore districts are used for the operation of set bagnets while tidal wall nets are operated in the extended tidal areas off Balasore coast. Typical fishing methods of Puri and Ganjam districts with their surf-beaten open shores and steep slope of the continental shelf are the operation of beach seines, lift nets, and boat seines. Gillnets and lines which are used all along the coastline of Orissa have different specifications in the north and the south of Orissa too, according to differences in economic conditions and abundance of fish species.

2.2.1 Gillnets

A fishing method practised all along the coastline of Orissa by the artisanal fisherfolk is the operation of gillnets. A gillnet is a wall net the lower end of which is weighted by sinkers while the upper end is raised by floats. Gillnets are set in a direction transverse to that of migrating fish. They are considered a passive fishing gear. While swimming forward, fish get caught in the meshes, sometimes at the beginning of the dorsal or behind the gills and opercles, so that the fish can swim neither forward nor backward. Larger fish, while struggling to free themselves, become entangled in the net, which is why gilling is very often combined with

entangling. To gill or entangle fish, the meshes must have the appropriate size as well as the correct shape. The visibility of the net also plays an important role. The entangling capacity of the net can be increased by hanging the net very slack, extending the length of the float line and/or reducing the amount of weight on the ground line. Gillnets are used in principle in two ways: drifting on the surface, connected with a rope to a fishing boat or set, e.g. anchored on the sea bottom.

In the artisanal marine fisheries of Orissa, gillnets are used exclusively as driftnets. They are operated either on the surface or, in South Orissa, close to the sea bottom to catch prawns.

To modify the gilling or entangling capacity in order to adopt the net to exploit the abundance of different fish species throughout the year, artisanal fishermen just change the number of sinkers. In artisanal fisheries gillnets are fabricated in small pieces which are later joined together to form an operational unit.

Even though gillnets are common everywhere along the coast, there are distinct differences between North and South Orissa with regard to length, depth, mesh size and other details of design and construction of gillnets, which are related to differences in operational conditions such as the type of fishing craft used, currents as well as with regard to the abundance of different species of fish. In the following section, the major types of gillnets now used by artisanal fishermen are described with regard to season, area, time and mode of operation, main species caught, sharing system and basic technical dimensions such as length, depth, mesh size and material used for netting, floats and ropes.

The gillnets common in North Orissa are 'Nakuda Jalo'¹ or 'Sanla Jalo', used to catch large species of fish like threadfins and croakers, 'Phasi Jalo' and 'Ilishi Jalo', mainly used to catch hilsa, 'Behendi Jalo', used to catch prawns and small fish, and 'Bhasani Jalo' for very small fish. All these nets are used as surface drift nets. In South Orissa the major gillnets used by artisanal fisherfolk

1. 'Jalo' is the Oriya word for net,

are a bottom driftnet called 'Jagavala', which is used to catch prawns, a surface drift net called 'Kilumala', which is used to catch prawns and pelagic fish such as mackerel, and another surface driftnet used to catch anchovies and sardines, which is called 'Katlala' or 'Kavalavala'.

2.2.1.1 Gillnets used by Artisanal Fishermen in North Orissa

-Nakuda Jalo and Sanla Jalo

Nakuda Jalo and Sanla Jalo are large mesh driftnets which are operated by artisanal fishermen in South Balasore and in Cuttack district. Even though there are some differences between the two nets in their design², the basic operational pattern is similar. The following is a description of Nakuda Jalo which is used off the southern coast of Balasore.

The Nakuda net is operated during spring and early summer, when small mangrove shrubs, growing along the coast, are in bloom and attract large species of fish such as threadfin, saw fish and large croaker³. Nakuda Jalo has a mesh size of 210 mm. One piece of net has a length of 80 meshes and a depth of 465 meshes. 150 net pieces are usually operated in a unit. Nowadays the netting is made from nylon and the floats from polyethylene. However, some nets are still made from hemp with wooden floats. Since Nakuda Jalo is used as an entangling net, it has no sinkers. It is fixed with a rope to a boat and together with it drifts through shallow water areas close to the coast, covering the entire depth of the water.

Ten crew members are required to operate the net. They work either for a fixed wage or on share basis. In the latter case the net pieces are contributed by the crew members and the proceeds from the sale of the catch are equally divided into 11 shares.

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1. 'Vala' is the Telugu word for net.
 2. The design of Nakuda Jalo is shown in annexure 2.3
 3. In Cattack district the net is operated throughout the year off river mouths;

One share goes to the boat, and one share to every 11 pieces of net'. Sometimes net owners do not participate in the operation of the net themselves but delegate a labourer whom they pay a fixed daily wage.

-Phasi Jalo and Ilishi Jalo

Both nets are almost identical, except for length and depth, because of different depth ranges in their respective areas of operation. Phasi Jalo has a stretched mesh size of 100-110 mm and its netting is made from polyethylene. One piece of net has a depth of 100-150 meshes and a length of 500 meshes. 30 pieces of net are joined together to form an operational unit.

Ilishi Jalo has a mesh size of 85-110 mm, the net pieces being longer (970 meshes) and less deep (70 meshes) compared to Phasi Jalo. 18 to 20 net pieces form a fleet or operational unit. The netting of Ilishi Jalo is made from polyethylene or nylon.

In Phasi Jalo as well as in Ilishi Jalo polypropylene is used for float line and sinker line. Floats are made from polyethylene, while sinkers are made from cement.²

The main species caught by Phasi Jalo and Ilishi Jalo is hilsa, which is economically the most important variety in North Orissa, besides white and black pomfret, croakers, perches, seer fish, horse mackerels, cat fish and silver bar fish.

Phasi Jalo and Ilishi Jalo are operated throughout the year except in rough weather during the south-west monsoon. Peak

1. The system that if a crew member does not contribute a piece of net, he does not get a crew member's share but is paid a fixed daily wage, which is comparatively unfavourable, is common among Oriya and Bengali fisherfolk and applies also to all other nets used in North Orissa. It indicates that the economic stratification and possibly also the social stratification among owners of artisanal fishing craft and gear and non-owners are more distinct in North Orissa than among the Telugu fisherfolk of South Orissa who do not know a wage labour system but have separate shares for contribution of gear and labour by crew members.
2. The designs of Phasi Jalo and Ilishi Jalo are shown in annexure 2.1 and 2.2

periods of operation are July/August for hilsa and from October to February for the other fish species. Both nets are surface driftnets usually operated from one boat from the evening until the next morning. Occasionally the nets are operated during day time when shoals of fish are spotted. The operational area extends up to 20 km off shore if the weather is favourable.

Four crew members are required to operate the net. Phasi Jalo and Ilishi Jalo are operated either on a wage labour basis in case the crew members do not contribute net pieces or on the basis of a sharing system under which different shares of the sales proceeds accrue to a boat, net pieces and crew labour. The most common rule is that the sales proceeds of the catch are divided into 5 shares, out of which one share is for the boat and one share for every 5 pieces of net.

-Behendi Jalo

Behendi Jalo has a mesh size of 53 to 70 mm. A piece of net has a length of 400 meshes and depth of 140 to 150 meshes. The netting, as well as the float and sinker line, are made of polyethylene. Polyethylene is used for floats too, while sinkers are made of cement. 40 to 45 pieces of net are operated in one unit.

The net is used mainly to catch prawns but is also used for small hilsa, mackerel, jewfish and similar varieties.

The fishing season extends from September to February reaching **its** peak from October to December during the prawn season. The net is set from early morning till noon. Behendi Jalo is operated in inshore waters within 5 km distance from the coast. One boat and a crew of four are required for the operation of the net.

As in the case of Phasi Jalo and Ilishi Jalo the crew members are paid a fixed daily wage if they do not contribute any net pieces. If they do, a sharing system prevails. The sales

proceeds are equally divided into 5 shares, out of which one share accrues to the boat and one share to approximately every 11 pieces of net.

-Bhasani Jalo

Of all gillnets used by artisanal marine fishermen in North Orissa, Bhasani Jalo is the one with the smallest mesh size (33 mm). One piece has a length of 2060 meshes and a depth of 100 meshes. Six to eight pieces are operated together in a unit.

The netting material is nylon. The floats are made of wood and the sinkers of clay. Polyethylene is used for the float and the sinker line¹.

The net is mainly used from January to June to catch sardines, anchovies, small catfish, small ribbon fishes, small perches and jewfish and other small fishes belonging to various species.

The operational area extends up to 10 km offshore. The net is set in the early morning hours and hauled at noon. Three or four crew members are engaged in operating the net.

As in the case of the other nets mentioned above, the Bhasani net is operated either on share basis or on wage-labour basis. In the first case, the sales proceeds are equally divided into 5 shares one share accrues to the boat and one share to every 2 net pieces.

2.2.1.2. Gillnets used by Artisanal Fisherfolk in South Orissa

-Jagavala

Jagavala is the only gillnet in Orissa's artisanal fisheries that is used not as a surface driftnet but as a bottom driftnet, operated by fishermen off the Puri and Ganjam coast.

1. Annexure 24 shows the design of a Bhasani Jalo.

It is primarily operated to catch prawns, even though pomfret, ribbon fish, croakers and other fish too are caught.

An interesting aspect of its operation is that the net is not anchored on the sea bottom as is the usual operational pattern, but just lowered towards the ground by adding additional weights to the sinker line and then drifts over the ground tied to a Kattumaram, locally called teppa.

The net is operated from March to August up to 10 km off the coast with a large Kattumaram. It is usually set in the early morning hours and hauled around noon

3 crew members are engaged in handling the net. One piece of net is 1500 to 2160 meshes long and 120 to 130 meshes deep. 10 to 12 nets are joined to form a unit. The mesh size ranges from 60 to 70 mm¹.

The sales proceeds are distributed on a sharing system. Out of 5 shares, one share goes to boat and net while 3 shares are equally divided among the labourers.

-Kilumala

Kilumala is a surface driftnet², which is used to catch species similar to those caught with Jagavala e.g. prawns, small ribbon fish, pomfrets, small croakers and jewfish. The net is operated throughout the year except in rough weather during the south-west monsoon in June/July. It is operated closer to the shore than Jagavala, at a distance not exceeding 6 km.

Its mesh size of 40 mm to 60 mm is slightly smaller than the mesh size of Jagavala, and its depth is less than half (55 meshes) the depth of Jagavala. The length of one piece of Kilumala is 2400 meshes. 4 pieces are operated from a small Kattumaram and 12 pieces from a large Kattumaram.

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1. The design of a Jagavala net is shown in annexure 2.11
 2. The design of a Kalumala is shown in annexure 2.12

A crew of 2 fishermen is required to operate 4 pieces and double the number is needed to operate 12 pieces. For netting, float and sinker line, floats and sinkers, the same materials are used as in the case of Jagavala.

The sharing system is also the same as described for Jagavala, if 12 pieces are operated.

In the case of an operational unit consisting of 4 pieces, the sales proceeds are equally divided into 8 shares, out of which 5 shares accrue to the two crew members and 3 shares to boat and net.

-Kavalavala or Katlala

Kavalavala or Katlala is the only gillnet used by artisanal fishermen in Orissa that is still made of cotton. Fermented rice water is used for preservation of the yam. The net has wooden floats and lead sinkers. Kavalavala is operated with a small Kattumaram by a crew of 2 fishermen. It catches mainly white bait, anchovies and sardines.

Depending on area, month and species available, the mesh size of Kavalavala ranges from 12 mm for small anchovies to 40 mm for large sardines. Length and depth range from 4180 meshes length and 600 meshes depth for a net of larger mesh size to 6845 meshes length and 700 depth meshes for a net of smaller mesh size¹. Only one piece of net is usually operated. The operational period lasts from October to February. Nets of smaller mesh size are operated up to 3 km off shore, while nets of larger mesh size are operated up to a distance of 5 km from the shore. During peak season, however, when shoals of fish come very close to the shore, the net is often operated within less than 2 km from the shore.

The fishing goes on from the early morning hours till noon. The reason why cotton is used instead of nylon or polyethylene is explained by the fishermen as follows. When fishing is very active,

1. The designs of a Kavalavala for sardines and a Kavalavala for anchovies are shown in annexure 2.13 and 2.14

the net is set several times during the day and after each haul the Kattumaram returns to the shore to dispose of the catch. While sailing back the fish is kept in the net.

On reaching the shore those fish that are not properly gilled or just entangled are shaken off the net while the others are removed one by one. In the context of this method of handling, cotton causes less damage to the fish than artificial yarn would, according to the fishermen. The catch is divided into 3 equal shares out of which 2 shares accrue to the two crew members and one to boat and net.

2.2.1.3 Conclusions

The gillnets used by artisanal fishermen in North Orissa as well as in South Orissa show a wide variety of mesh sizes and designs and indicate that the operation of this type of fishing gear has been adopted in quite a sophisticated and complex way to **accord** with the various environmental, economic and operational factors.

It is astonishing, for example, how quickly artisanal fishermen responded to the increased demand for prawns by introducing large numbers of Kilumala and Jagavala nets. The abundance of prawns, mackerels, sardines and anchovies in South Orissa is clearly reflected in the use of gillnets of small and medium mesh sizes. In North Orissa most of the gillnets are of medium and large mesh sizes and catch hilsa, pomfret, jewfish, croakers, perches and larger species of fish, which are in abundance and in great demand, particularly in Calcutta.

Regarding the material and fibres from which accessories such as floats, sinkers, head rope, foot rope and netting are fabricated, synthetic fibres such as nylon, polyethylene and polypropylene have almost completely replaced natural fibres and materials such as cotton, hemp, wood and clay. The replacement of natural by synthetic fibres has taken place almost indigenously without much outside assistance from government agencies and

other institutions, It has increased the efficiency of the traditional gillnets to a very large extent, due to the fact that synthetic fibres are less visible than natural ones. apart from other advantages such as easier handling, hardly any need for preservation, longer life span and less weight.

All in all gillnets operated by artisanal fishermen in Orissa are well adapted to the environmental conditions such as abundance of resources as well as to the consumer demand and preferences. Furthermore, modern materials such as synthetic fibres and metals used for fabrication of yarn, ropes, floats and sinkers have been widely incorporated in the artisanal gillnet fishery.

2.2.2. Encircling Nets, Boat Seines and Beach Seines.

Some species of fish like hilsa, sardines and mackerels, during certain seasons of the year, gather in large shoals close to the surface of the sea and move towards the shore. While entering shallow water or penetrating into beaches or estuaries these shoals become accessible to artisanal fisheries.

Once fish shoals are in shallow water they can be easily surrounded with nets reaching from the top of the water to the bottom. These nets are called encircling nets. With no way left to escape, the fish are frightened by striking the water with oars, sticks and other means and thereby driven into the net. Fish are harvested from the enclosed area with the help of scoop nets or seine nets. In the artisanal marine fisheries of Orissa encircling nets are operated in the extended shallow waters off the coast of Balasore and North Cuttack districts. Khia Badia Jalo, Sarini Jalo and Gheri Jalo are operated off river mouths or very close to the shore while Jangal Jalo and Sabado Jalo are operated further out in the sea. Compared to the other fishing methods employed by artisanal fisherfolk, the operation of encircling gillnets is quite a 'large-scale' one, considering the number of fishermen involved, the duration of the operation as well as the amount of capital required.

In deeper waters, however, like those off the coast of South Orissa, where nets cannot reach the ground, the method described above cannot be employed, since the fish have the chance to escape into the depths. Here fishing gear which surrounds the fish shoal from below as well as horizontally is required. For this purpose a shovel-shaped gear which surrounds the fish shoal completely would be suitable. A variety of such gear has been developed in East and South Asia (Brandt 1972, p. 167), which are shaped like a dust pan. They are called lampara-like nets. The principle of their working is that, after surrounding a fish shoal, the open front side of the net shovel is closed by lifting the anterior edge of the net. An example is the 'Kolli net' which is used on the Malabar Coast of India.

Lampara-like nets, however, are of comparatively large size and weight and require a fishing craft which has a higher carrying capacity than the Kattumaram presently used in South Orissa, not to speak of the problem of carrying the catch back to the beach.

For this and other reasons, in South Orissa beach seines and boat seines are used, instead of encircling nets, to catch shoaling fish close to the shore.

Boat seines have long wings on both sides, as well as long hauling lines, which are attached to the wings. They have a strong centre to collect the fish caught, sometimes with a net bag attached. They are operated by two Kattumarams.

Beach seines consist of a bag to which two wings are attached. They are laid out in a semicircle facing the shore and then pulled towards it.

In the following section, five types of encircling nets used in North Orissa are described as well as a boat seine employed by artisanal fishermen in South Orissa.

2.2.1. Encircling Nets of North Orissa

-Jangal Jalo

The Jangal Jalo net is operated off North Balasore coast usually within 10-15 metres depth. It is operated from August until the end of February. The main species caught are hilsa, croakers, threadfin, catfish, perches and perch-like fishes such as grouper and snappers.

35 fishermen in 5 boats participate in the fishing operation. Each fisherman contributes 5 pieces of nets, so that 175 pieces of net are operated in a unit. The 2 biggest boats out of the 5 boats carry the gear to the fishing area. On locating a shoal of fish, the net is deployed around the area by the two bigger boats. The three smaller boats remain within the encircled area and the fishermen beat the water with empty tins and oars to drive the fish into the net. While the smaller fish are gilled, the bigger ones are trapped in the pouches above the sinker line, which touches the sea floor.¹

One piece of net has the following dimensions :²

It has a mesh size of 62 mm, a length of 360 meshes and depth of 330 meshes. Its netting, head and footropes are made of polyethylene. Wooden floats and clay sinkers are used.

The fishing unit usually stays out at sea for days at a stretch, while one boat carries the catch to the shore and returns with supplies. In some cases the catch is collected at sea by the merchants.

Regarding the sharing system, the sales proceeds are equally divided into 41 shares, after deducting common operational expenses. The two bigger boats get 1.5 shares each while one share accrues to each of the three smaller boats. One share goes to every 5 pieces of net, which are contributed by each of the crew members.

1. In some cases fixed tapering nets are used to harvest the fish encircled by Jangal Jalo.
2. The basic design of a Jangal Jalo is shown in annexure 2.5

Sabado Jalo

Sabado Jalo is another encircling net which is operated by stisanal fishermen off Balasore coast and also off North Cuttack coast.¹ Compared to Jangal Jalo it is operated closer to the last, sometimes even at the mouth of a river. Seven fishing coats and 36 crew members are engaged in the operation of a Sabado Jalo. The net catches species similar to those caught by Jangal Jalo.

The two largest fishing boats carry the gear to the fishing sound, joined by the other five boats. On locating a shoal of fish the two larger boats share the net between themselves and circle the area. The other boats remain in the circle and their few beat the water with empty tins and oars to scare the fish to the net.

Unlike the operation of the 'Jangal Jalo' net, the sinker he is pulled after encircling the shoal and forms a pouch or rse so that the fish is trapped. The fish is sometimes kept alive the net for days and harvested little by little with scoop nets seine nets to avoid bulk landings.

Au operational unit of 'Sabado Jalo' consists of 2 pieces of net. One piece has a mesh size of 50 mm, a length 410 meshes and a depth of 975 meshes. The netting is made cotton; the float line of polyethylene; and the sinker line of uæ. Wooden floats and stone sinkers are used.

The net is operated from August to February. The sharing system works as follows : one share goes to each of the boats al one share to every 7 pieces of net which are contributed by ab of the 36 crew members.

Sarini Jalo

Another encircling gillnet which is operated close to the ore or at the mouth of a river is Sarini Jalo. With 25 mm it is a smaller mesh size than Jangal Jalo and Sabado Jalo.

The design of Sabado Jalo is shown in annexure 2.6

Sarini Jalo is operated throughout the year except in rough weather during the south-west monsoon. Jewfish, threadfins, perches, hilsa and mullet are the main species caught by this gear.

Sarini Jalo is operated by 20-30 fishermen from 2 or 3 boats. 90 pieces of net are joined together to form one operational unit. One piece of net has a length of 766 meshes and a depth of 460 meshes. The netting material is cotton. The float and ground line are made of hemp. Wooden floats are used.' On reaching the fishing ground and locating a shoal of fish, the boats deploy the net in a circle and the fish are driven into the net by beating the water with oars and empty tins. The proceeds from the sale of the catch are equally divided into 33 sharer, out of which one share goes to each boat (in case 3 boats are operated), and one share to every 3 pieces of net.

--Gheri Jalo

Gheri Jalo is an encircling net of considerably less depth and a larger mesh size than the three nets described above. It can be operated only in shallow waters very close to the shore. Artisanal fishermen in North Cuttack district use it in inshore waters off the Hansua river mouth. The main species caught are croakers and threadfins. The fishing season for Gheri Jalo extend: from October to March.

Fishing usually continues for seven or eight days at a stretch starting 3 or 4 days before full or new moon and continuing until 3 or 4 days after. The catch is brought back to the market in a separate boat. The net is operated by two boats as describe earlier for Jangal Jalo and Sabado Jalo: one rope is kept on the shore while a boat deploys the net in a semicircle and returns the other end of the net to the shore. A crew of seven in the case of one boat or 14 in the case of two boats is required for the operation.

Gheri Jalo consists of seven pieces. One piece is 1000 meshes in length, 35 meshes in depth and has a mesh size of 200 mm. The

1. Annexure 2.10 shows the design of Sarini Jalo.

netting is made of nylon, the floatline of polyethylene while the sinkerline is made of jute. Polyethylene floats are used and sinkers are made of stone.¹

The proceeds from selling the catch are divided into 8 equal shares if one boat is operated, out of which one share goes to the boat and one share to each piece of net, which is contributed by each of the seven crew members.

-*Khia Badia Jalo*

Another large mesh encircling gillnet, which is operated in shallow waters off the coast of North Cuttack district, particularly off Hansua river and Hukito Bay is called Khia Badia **Jalo**.

It has a smaller mesh size (122 mm) than Gheri Jalo and catches, besides hilsa, threadfins and croakers as well as clupeids.

One piece of net has a length of 200 meshes and a depth of 60 meshes. The netting is made of nylon, polyethylene is used for float and sinker line as well as for floats, while stones are used as sinkers.²

The fishing season for Khia Badia Jalo extends from October to March. The net is operated either by one boat from the shore or by two boats as an encircling net. 96 pieces are operated in a fleet.

The operation of the net is similar to the one already described for Gheri Jalo. 7 crew members are engaged if one boat is used, 14 crew members are involved if two boats are employed. In the latter case the sales proceeds are divided into 16 *equal* shares out of which one share accrues to each of the two boats and one share to every 6 pieces of net.

2.2.2.2 Boat and Beach Seine of South Orissa

In olden days boat seines were the most common gear used with Kattumarams. They were operated throughout the year to catch

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1. Annexure 1.6 shows the design of Gheri Jalo.
 2. Annexure 2.7 shows the design of Khia Badia Jalo.

various species. Their operation, however, depended very much on favourable winds and currents. Later on, with the introduction of gillnets, which did not depend so much on winds and currents and which were more selective and specialized, and with the competition of trawlers, the number of boat seines was considerably reduced. Nowadays boat seines have almost become a secondary gear, operated only when other gear cannot be used profitably.

-Irragali (Irgali)

Irragali is a boat seine which is operated off the coast of Ganjam, Puri and South Cuttack districts from February to August. The catch consists mainly of jewfish, ribbon fish, sardines, mackerels, silver bellies, small threadfins and shrimps.

The net is operated by two Kattumarams from early morning until noon within 5 kms from the shore.

Irragali is made of cotton. It consists of two wings and a bag. The wings are approximately 25 metres long, while the bag has a length of 11 metres and a depth of 2.7 metres. The mesh size in the wings is 120 mm, 60 mm in the mouth of the belly, and 20 mm in the cod end. For float and sinker line cotton is used. Floats are made of wood and sinkers of stone.¹

The preservative is made by boiling and extracting the bark of a plant called *Acacia fistula*. Another preservation made of powdered tamarind seeds is also used.

The net is operated in the following way. Two Kattumarams **sail** to the fishing ground, one carrying the net. On reaching the fishing ground both come together to stretch out the net. In order to do this, the two Kattumarams move almost directly away from each other, laying out the net and 60 m of coir rope on each side. When the net is fully released the Kattumarams turn at right-angles and move on a parallel course, usually with the current. As they move closer to each other and haul the lines and wings.. together, the fish are concentrated and directed into the bag.

1. Annexures 2.15 and 2.16 show the design of an Irragali.

The returns from fishing are shared by dividing the sale proceeds into equal shares and allotting one share to each Kattumaram, one share to the net and one share to each fisherman.

-Bada Jalo

Along the wide beaches of Gnnjam and Puri districts, beach seines, locally called Rada Jalo, are operated to catch shoaling fish which enter the beach area during certain seasons.

Beach seines are operated from October to April, whenever shoals of fish come close to the shore and weather conditions are favourable. The catch consists mainly of anchovies, sardines and silver bellies.

The beach seine has a detachable bag portion and 2 wings. To each wing a towing warp is attached.

The net is operated as follows. It is loaded on a barboat which takes the net out to sea. One towing warp is left on the shore. The shore side wing of the net is laid out, and after the bag of the net is released, the boat moves in a semi circle and, laying out the other wing, brings the second towing warp back to the shore. The two towing warps are then pulled in by 10 or 12 persons on each side, moving closer together as the net comes nearer the shore. Two or three fishermen remain in the water to guide the net onto the beach. Before reaching the shore the bag portion is detached from the net. 30 to 35 people, including the boat crew, are engaged in the operation.

The beach seine consists of different sections, which are made of different materials and have different mesh sizes and different dimensions. For the belly portion of the bag as well as its cod end, cotton and hemp are used. The belly portion has a length of approximately 12m. The wings of Bada Jalo consist of three parts. The first part near the belly portion of the net is made of cotton. For the middle portion coir is used, while the outer part near the rope is made of hemp. The lengths of the three parts are 32m, 55m and 137m respectively. The towing warps which are made of hemp and coir have a length of 22.5 metres.

The shore side towing warp consists of 30 ropes. The sea side warp consists of 50 ropes. Two hemp and one coir rope, in some nets one hemp and one coir rope, are joined in series.¹

The mesh size near the wings is 62 to 75 mm, while the mesh size near the cod end is 20-25mm. The cod end itself has a mesh size of 8 mm.

The sales proceeds are shared in the following way : 2/3 of the sales proceeds accrues to the owner/owners of net and boat and 1/3 to the labourers which is distributed according to the type and amount of work each labourer contributes : if the catch is small the share of the labourers increases, and vice versa.

2.2.2.3 Conclusions

Various types of encircling nets and seine nets are used by artisanal fisherfolk in Orissa to catch pelagic species of fish which appear in shoals during certain seasons of the year in shallow waters close to the shore, For Balasore district and North Cuttack district with their extended shallow continental shelf areas, 5 varieties of encircling nets have been described, they differ in mesh, size, depth, length and other details, to suit local conditions, such as abundance of species, availability of estuaries, etc.

In South Orissa, with its open surf-beaten beaches and the comparatively steep slope of its continental shelf, boat seine and beach seine are operated. They are more appropriate than encircling nets considering the type of sea coast and the type of fishing craft available e.g. Kattumarams and bar-boats.

While synthetic fibres are used for the fabrication of Jangal Jalo, Khia Badia Jalo and Gheri Jalo, the other two encircling nets as well as boat seine and beach seine are still made of natural fibres.

There might be at least two reasons why the replacement of natural fibres by synthetic fibres has been slower than in the

1. Annexure 2.18 shows the design of Bada Jalo.

case of gillnets. Since encircling nets are active and not passive fishing gear, the advantage of synthetic twines in being **less** visible than natural twines does not count as in the case of gillnets.

Secondly, encircling nets and seines are quantitatively and economically less important than gillnets and sometimes even considered old-fashioned and outdated. Therefore, the process of replacement of natural by synthetic fibres, particularly its encouragement by financiers such as fish merchants and middlemen has been a slower and more selective one.

2.2.3 Tidal Wallnets

In the ebb and flow areas along the Balasore coast, tidal wall nets are operated. The method of catching fish with permanent and semi-permanent barriers that prevent fish from escaping during ebb tide has been practised since pre-historic times." In the beginning, small pools or pits were dug in areas which were known to be flooded during high tide. Later, stone or mud walls were constructed which were then replaced by fences made of bamboo, hrushwood and mats. Nowadays nets are used which are more easy to handle. During high tide fish pass over these nets and are caught during low tide when they try to follow the water flow. Along the coast of Balasore district a type of tidal wall net is used which is locally called Malo Jalo. In some areas it is also called Bheda Jalo.

--- Malo Jalo

Malo Jalo is a tidal wall net which is fixed to bamboo sticks at intervals of 2.8 m to 4.4 m. The net is set during low tide on the flat, gradual beaches of central Balasore district, where the distance between the high tide line and the low water line ranges from 2 to 4 km. The gear is operated continuously for 7 or 8 days during new moon and full moon, when the tidal differences are maximum.

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1. In accordance with BRANDT (1972, p. 180) active gear is defined as gear which the fish takes involuntarily while passive gear is taken voluntarily.
 2. See BRANDT 1972, p. 85 f.

Fish which pass over the net at high tide are trapped in the meshes during low tide and collected with the help of scoop nets.

The netting of Malo Jalo is made of polyethylene. The depth of the net is 67 meshes except for the middle portion where the fish are collected, and which is 140 meshes deep. The mesh size ranges between 40 and 50 mm. Head and ground line are made of polyethylene.

10 fishermen are required to operate the net. They are usually employed on a fixed wage basis by the person who has taken the area of operation on lease from the revenue department and also owns the net. At present tidal wall nets are operated on a large scale, wherever the area is suitable.¹

2.2.4 Liftnets

Liftnets belong to a category of gear which are dipped into the water and with expertise lifted up again, once the fish to be caught have gathered over them.

There are various types of liftnets such as portable hand liftnets, stationary liftnets and liftnets operated by boats.

Along the sea coast off South Orissa, liftnets operated by four Kattumarams have been a common gear in the past and are still operated, even though on a smaller scale.

Liftnets are mainly operated to catch fish shoals while they are moving along the coast. In Orissa liftnets are usually used with lures to attract fish to swim over the net.

—Marala

The type of liftnet which is used off the coast of South Orissa is locally called 'Marala'.²

Each of its four wings is approximately 26 m long. The mesh sizes in wings, belly and cod end are 120 mm, 50 mm and

1. A design of a tidal wall net is shown in annexure 2.9.
2. The design of a Marala is shown in annexure 2.17.

30 mm respectively. To the edges of the wings, 60 m long coir rope warps are attached, which are used to dip and lift the net. Stones are used as sinkers. Sometimes, two Irragalas are joined together to make a Marala.

Nowadays the net is mainly used from February to April to catch anchovies, sardines, mackerels, silver bellies, shrimps and jew fish.

The net is worked by four Kattumarams which drop the net to the sea bottom and lift it up again, when fish swim over it. 8 to 12 crew members are engaged in the operation of a Marala net.

Out of the sales proceeds 50% goes to the owners of the boats and nets while the other 50% is equally divided among the labourers.

2.2.5 Handlines and Longlines

Three types of handlines/longlines are used by artisanal fishermen in the coastal waters of Orissa. All of them are operated in the South. In North Orissa longlines are used only in estuaries and, therefore, not described here.

Out of the three types of lines, one is a spinning line called 'Kata', operated from the beach, another a handline called 'Burdu', used from a Kattumaram which at the same time operates a gillnet and the third one is a surface longline called 'Suti', operated from a Kattumaram. All three lines are used only occasionally and when compared to other fishing gear are not very important.

-Kata

Kata is operated by a single fisherman from the shore near the surf line or from the mouth of an estuary, usually in the early morning or in the evening. The main species caught are threadfins and perches. The gear consists of two 50 m long nylon lines of one mm diameter each. A piece of wood is fixed to the line, which has a lead piece of 30 gm attached to it and is wrapped

in a white cloth so that it looks like a fish. Two hooks are fixed to the wood and are also wrapped in the cloth. One hook is larger (80 mm stem 35 mm bend x 34 mm end with a 20 mm barb), the other smaller (50 mm 20 mm x 16 mm also with barb). The handline is spun and thrown beyond the breakers and pulled back to the shot-c. During the operation the wood floats on the water with the lead and hooks below it.

--Burdu

Burdu is operated from a kattumaram which at the same time operates a gillnet. The fish caught in the gillnet attract predators, which in turn are caught by the handline.

Burdu consists of two nylon lines with a length of 180 m to 200 m and a diameter of 1 or 2 mm. Flat lead pieces followed by a small stone are used as weights. 2 to 4 barbed hooks are used. Their size is 40 mm stem x 16 mm bend x 16 mm end.²

The hooks are baited with small fish or shrimp and lowered into the water close to the bottom. The hooks are then *jerked* at intervals. Dogfish, catfish and perches are mainly caught.

—Suti

Suti is a traditional floating longline which is used only by a few fishermen now-a-days because of the higher efficiency of gillnets. Suti consists of a mainline to which hooks are attached with snoods. The mainline has a maximum length of 750 m and a diameter of 2 or 3 mm. It is made of nylon. The snoods are made of nylon, too. Their length ranges between 30 and 60 metres. The hooks are of the size 7 to 10 mm. The distance between each hook is about 1 m, so that approximately 750 hooks are operated. They are baited with shrimps, anchovies and cuttlefish.

Suti is operated throughout the year. It is set in the evening and hauled the next morning. It is used along the southern coastline within 3 km from the shore. A crew of two fishermen is required

-
1. Annexure 2.20 shows the design of Kata.
 2. Annexure 2.19 shows the design of Burdu.

for its operation. One end of the gear is connected to the kattumaram while the other end is fixed to a buoy. The lines are shot and hauled by hand.

2.2.6 Cast Nets

Hand-operated cast nets are a common gear all along the coastline of Orissa. Originally used for lake, pond, river and estuarine fishing, cast nets have been adapted to fishing from the seashore in less than 3 metres depth. Cast nets are also operated from a boat and within less than 3 metres depth when shoals of fish are located.

Whether operated from a boat or from the shore, cast nets have to be thrown with great skill so that they fall flat upon the surface of the water and quickly sink to the ground. The cast net used along the sea-shore of Orissa is called Khepa Jalo.

-Khepa Jalo

Khepa Jalo is made of nylon and has a conical shape. The loop is connected at its apex with a hauling-in rope. Its circumference is 10 to 20 m and the height of the net is 3 to 5 m. The mesh size ranges from 50 mm to 20 mm. The sinker line is made of polypropylene weighted with 200 or more lead sinkers.

Khepa Jalo is operated thus : while the hauling rope is held, the Khepa Jalo is whirled above and then cast so that its sinker line falls flat on the water forming a circle.

After the sinker line has reached the ground, the hauling rope is slightly lifted so that a bag is formed along the circumference of the net in which fish and prawns which try to escape are trapped. Khepa Jalo is operated usually during the early morning hours and whenever shoaling fish are located.

2.3 Artisanal Marine Fishing Craft of Orissa

As on the northern coast of Orissa with its wide shelf, gradual slope and extended tidal range, differs from the fishing gear used on the southern coast, so also do the two areas boast

distinct types of fishing craft. The estuaries in the north provide landing facilities and shelter for plank built displacement boats of various types such as Chhoat, Patia, Botali, Salti, Donga, Dinghy and Sabado, which cannot be operated from the open surf-beaten beaches in the south.' There, raft-type kattumarams called teppas are used, which are able to cross heavy surf and land on the beach. Since kattumarams can be easily assembled **and** disassembled it is possible to carry them up to the beach in order to protect them against the breakers and to dry them.

Besides kattumarams, bar-boats, locally called Podhua, are used along the southern coast of Orissa to operate beach seine nets, **All** the craft in Orissa excepting Navas are constructed locally with simple tools. They are driven by sail, oars or paddles and the range of operation is limited to the coastal belt up to a depth of 15 to 20 fathoms.

2.3.1 Fishing Craft of North Orissa.²

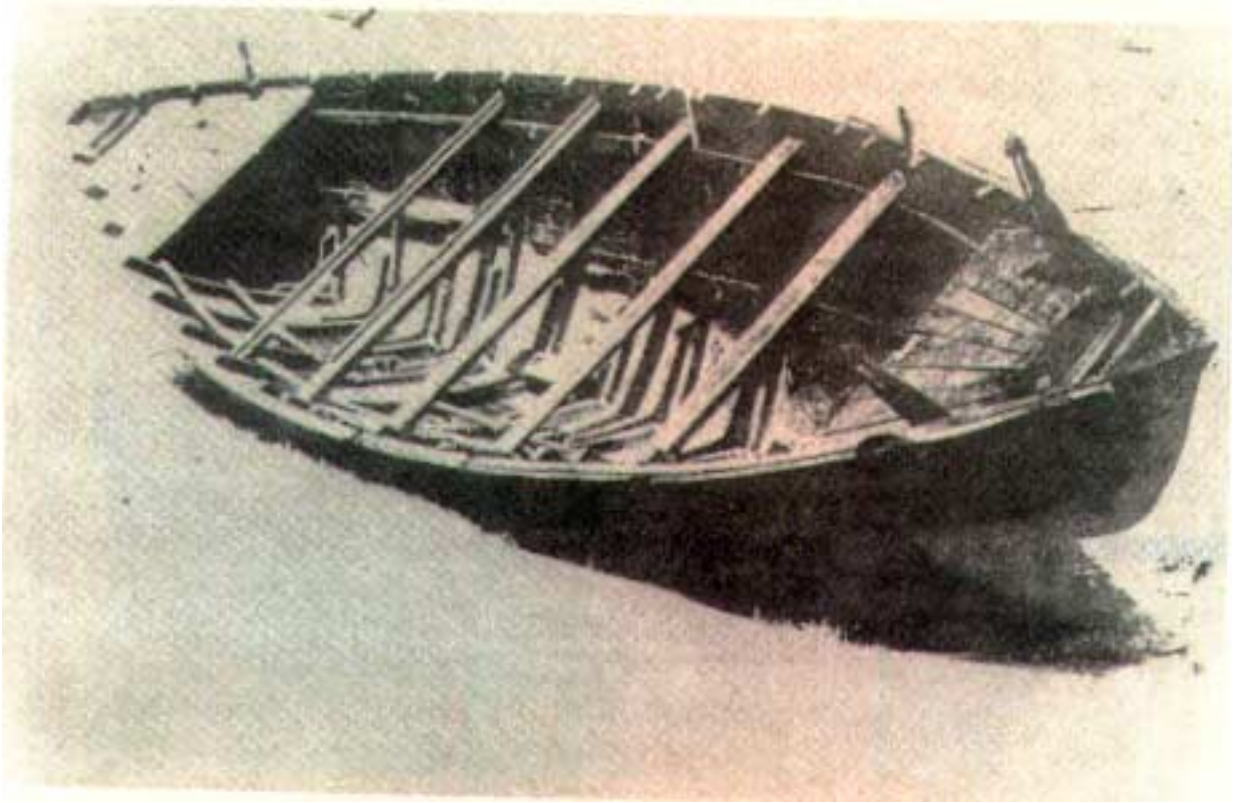
- *Chhoat*

The Chhoat is the largest traditional fishing boat used by artisanal fishermen in Orissa. It ranges from 10-11 metres in length. A 10.4 m long boat has a width of 2.40 m and a depth of 1.50 m. The wooden mast has a height of 8.6 m and the rectangular sail cloth has the dimensions 6.4m x 6m. The Chhoat is a carvel-built double-ender, the aft being more extended. It is made of salwood (*Shorea robusta*). Chhoats are comparatively seaworthy and used in the northern part of Balasore district to carry encircling nets to the fishing ground. They are also used to operate driftnets for hilsa. Chhoats fish up to 30 km from the shore if the weather is favourable. Some Chhoats have been mechanized indigenously,

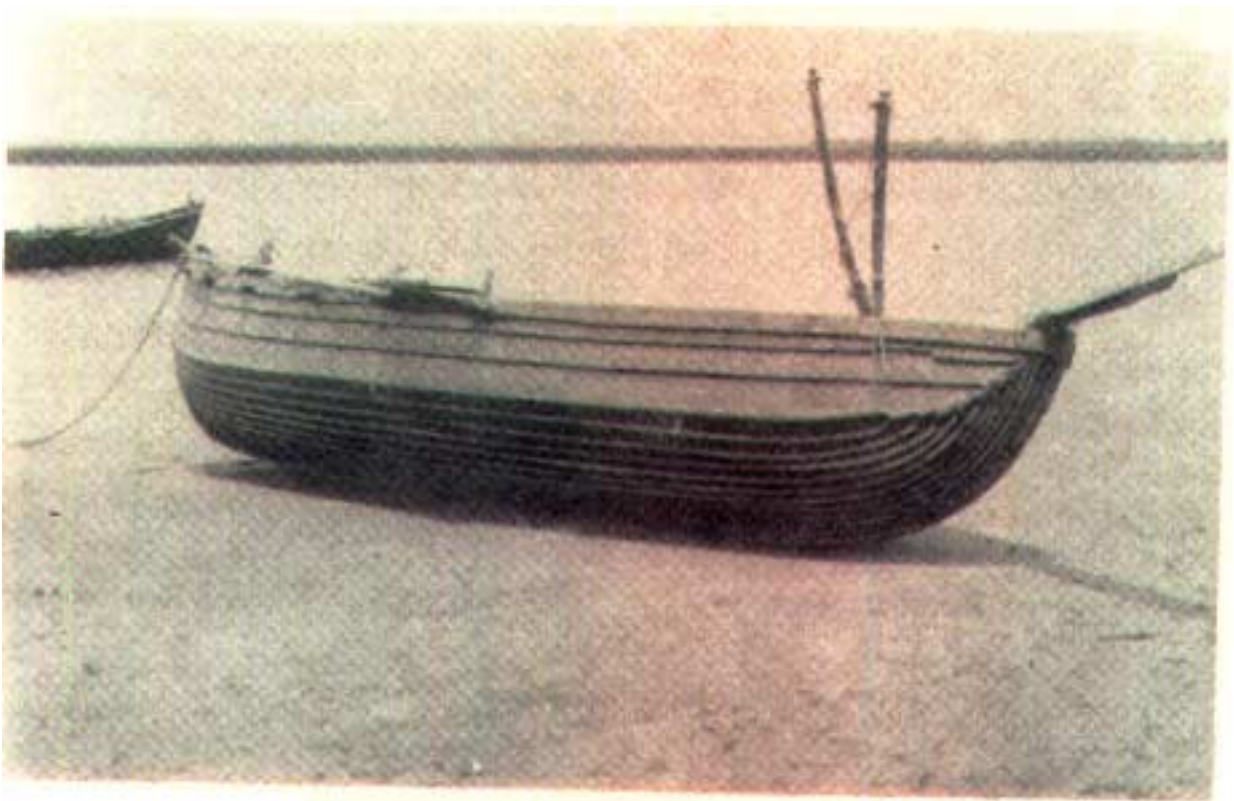
-*Patia or Botali*

The Patia is a clinker-built boat made of salwood with almost vertical stem and stern.

1. The only exception are framed, plank built boats called Navas, which migrate during the calm season from November to February from Andhra Pradesh to Puri to fish there with large mesh driftnets.
2. The designs of the craft described in this chapter are given in annexure 3



Chhoat



Patia (Botali)



Danga



Dinghy

The length ranges from 8.5 to 10.5 metres. An 8.95 m long boat is 1.8 m wide and 1.3 m deep.

The wooden mast of Patia has a length of 8 metres and the rectangular sail cloth is 6.4 metres by 6 metres.

Patia is used in encircling gillnet and driftnet fishing. It is quite a seaworthy fishing craft and her area of operation extends up to 30 km off shore.

— *Danga*

The Danga is clinker-built, constructed like Patia. The Danga is made of salwood. Stern and stem are nearly vertical. The maximum beam is forward of midship. The length of a Danga ranges from 7.5 to 9 metres.

A Danga of 8.3 m length has a width of 1.91 m and a depth of 1.26 m. The height of the mast is 7 m. The boat is driven by a rectangular sail measuring 5.5 by 5 metres.

The Danga is similar to Patia and a relatively seaworthy craft. It operates with driftnets up to 20 km from the shore.

Flat bottomed versions of the Danga that are not seaworthy are operated in the estuarine waters of North Cuttack and South Balasore districts.

— *Dinghy*

The Dinghy is also made of salwood and carvel-built. The length varies between 6 and 9 metres. A 6.5 metres long boat has a width of 1.63 m and a depth of 0.97 m. Like the three types of traditional boats discussed above, the boat has a full midship section, the double ends close to vertical. The wooden mast has a length of about 4.6 metres and holds a rectangular sail cloth which measures 3.6 by 4.2 metres.

The Dinghy is widely used for all types of fishing up to a distance of 20 km from the shore.¹

1. Another version of the Dinghy, locally called Bengali Dinghy, is meant for estuarine and river fishing.

Salti

The Salti has a more oval hull with extended and raised ends. It is made of salwood and carvel-built. The length ranges from 7 to 10 metres. A 9.8 metres long Salti has a width of 2.1 metres and a depth of 1 metre.

The wooden mast has a height of 5.2 metres while the sail cloth is 4.1 metres at the top, 4 metres at the bottom, 5.1 metres at luff and 2.8 metres at leech.

The Salti is not seaworthy and used in the sea only from October to February when the weather is calm enough for encircling net operations and gillnet fishing. During the rest of the year Salti is used for estuarine fishing.

-Sabado

The Sabado fishing boat is similar to the Salti but larger. Both ends are extended and raised, the aft end more than the fore end. The boat is carvel-built with an oval hull made of salwood. The length ranges from 9.75 to 13.5 metres. A Sabado boat with a length of 13.4 metres has a width of 2.4 metres and a depth of 0.97 metre. The wooden mast has a height of 5.75 metres and the dimensions of the sail cloth are 4.5 metres at the top, 4.3 metres at the bottom, 5.5 metres at luff and 3 metres at leech.

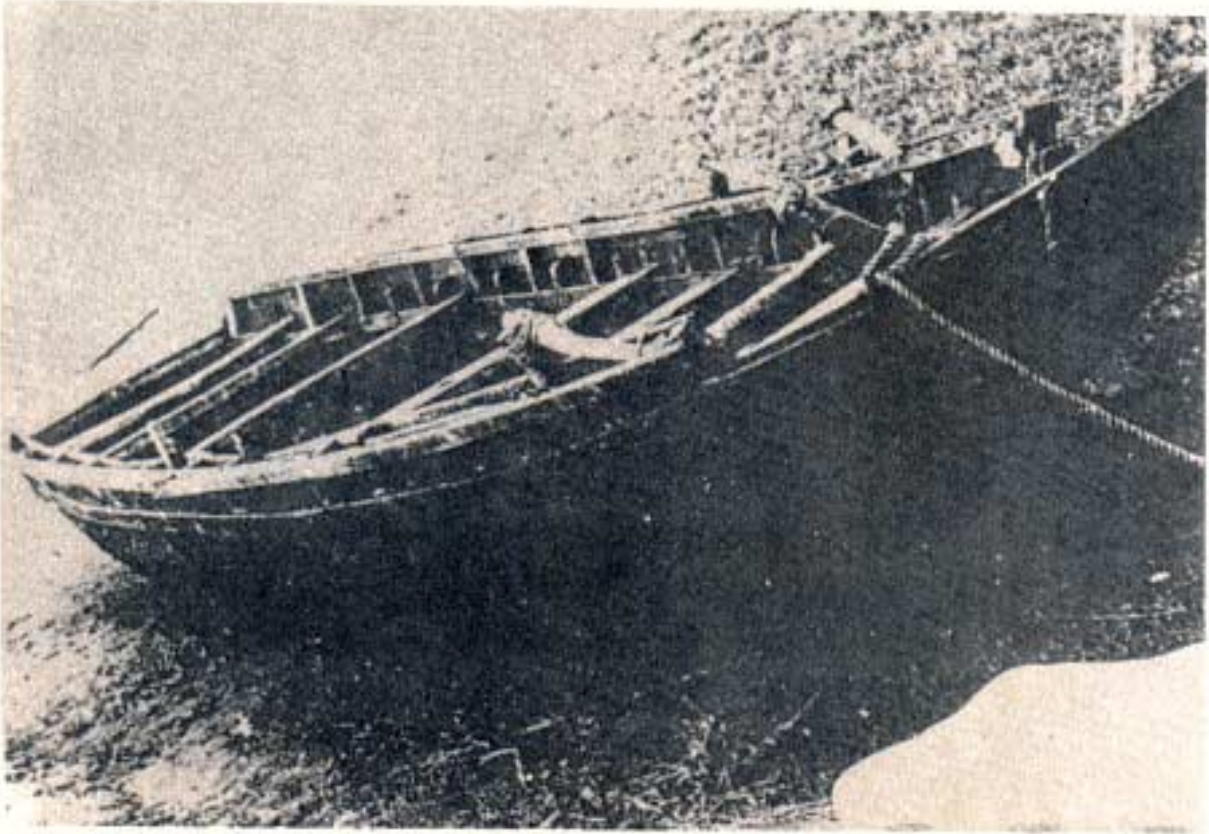
The boat is operated in the sea only in calm weather, mainly from October to February. During this period it is primarily used with encircling nets close to the shore or with shore seines, Gillnets are also operated with Sabado boats.

During the remaining months of the year, the Sabado boat is used for estuarine fishing.

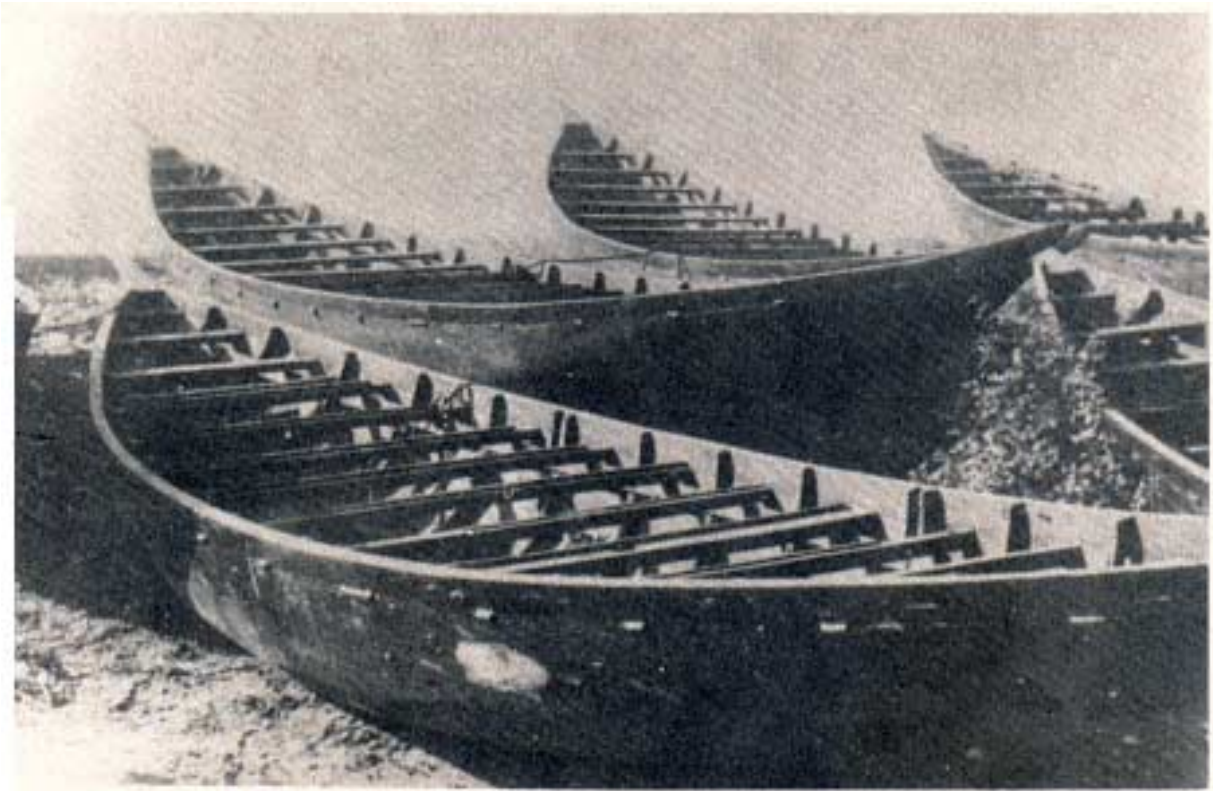
2.3.2. Fishing Craft of South Orissa

- Kattumarams/Teppa

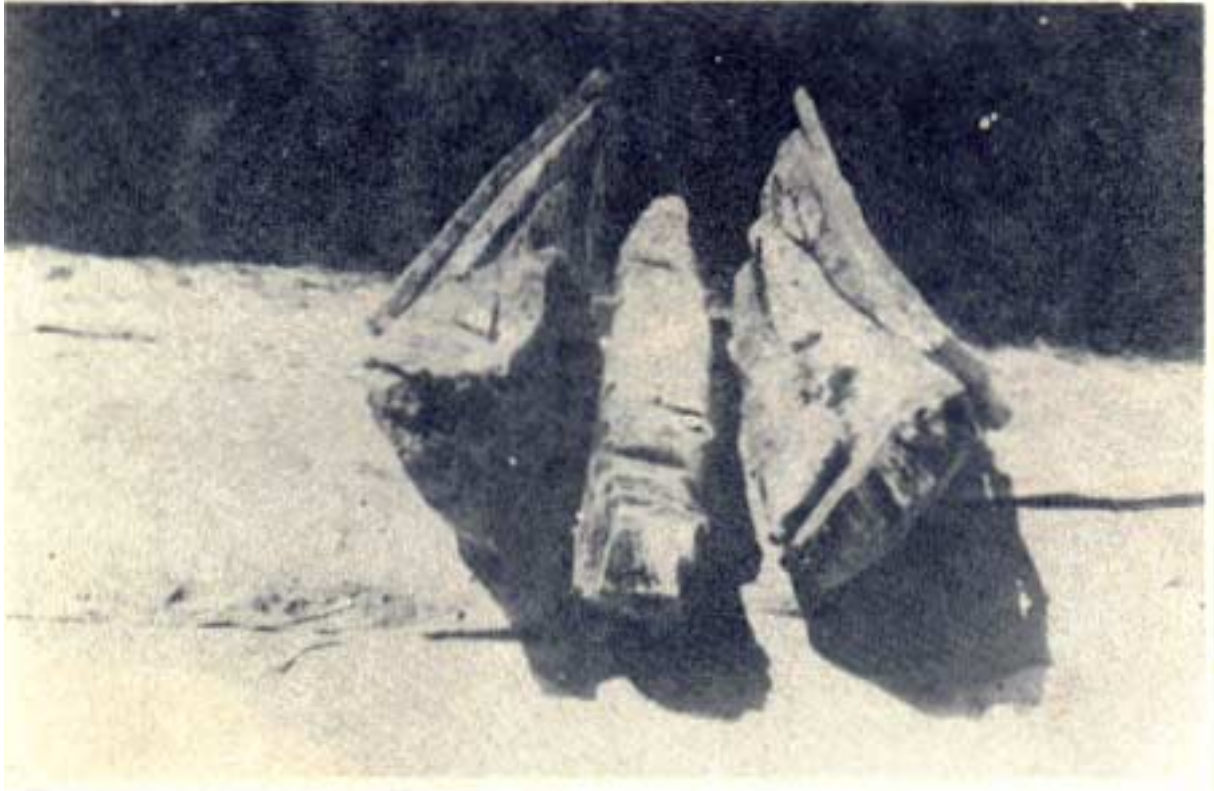
The Kattumarams, common from Paradeep southwards, range from 4.2 to 8.5 metres in length. They are locally known as Teppa. They are made of two, three or four log pieces, which are themselves made of a number of smaller pieces pegged together.



Salti



Sabado



3-log teppa



4-log teppa

Three types of Kattumarams can be distinguished according to the number of log pieces or sections they consist of.

The two-logged Kattumaram is the largest Kattumaram and is handled by about 3 to 4 fishermen, whereas the smaller three-logged or four-logged Kattumarams are operated by only two fishermen. The entire flotation of these crafts is due to the buoyancy of the logs as the wood is light, the main species being *Albizzia stipulata* and *Erithryna india*, locally known as Chakunda and Paldhua.

The three-log Kattumaram ranging from 4.2 to 5 metres and the four-log Kattumaram ranging from 4.5 to 5.5 metres are the most common craft that are widely used along the surf-beaten beaches of Puri and Ganjam districts. Fishing is done up to 8 km from shore almost throughout the year, whenever the surf is negotiable, the breaks being mainly during the monsoons.

The three-log and the four-log Kattumarams have a bamboo mast of 4 and 4.5 metres length and triangular sail cloths which measure 4 and 4.5 metres at the luff side and 2.8 and 3 metres at the lower angular side.

The two-log Kattumaram is a bigger craft from 6 to 8.5 metres in length; each half is made of two bigger median logs and smaller peripheral logs. Vertical wash strake and accessory stem pieces give the craft a sharp break point above the general level.

The two-log Kattumaram has a bamboo mast of 8 metres length and a triangular sail which measures 7.5 metres at luff and 6.25 metres at the lower angular side.

--Bar boat

The bar-boat, locally known as Podhua, ranges from 7 to 8.3 metres in length and is made from Mango planks (*Mangifera indica*). The boat is without frames, stem more vertical than stern, it lifts well, and can withstand the knocking of the surf. The boat is used for beach seining along the southern coastline from October to April.

The Podhua has a mast of 2.5 metres length and is driven by a triangular sail which measures 8.3 metres by 5.6 metres by 4.9 metres.

—Nava

Another traditional fishing boat which however, is used only seasonally and only in one location, i.e. Puri, is the Nava. The Nava is a plank-built boat brought from Andhra Pradesh and is operated from the open beaches from October to February during calm weather. The length varies from 8.5 to 10 metres.

The Nava has a wooden mast with a length of 5.5 metres and is driven by a triangular sail which measures 8 metres by 7 metres by 7 metres. It is the only craft described here that is not made by carpenters in Orissa.

2.4 Development and Distribution of Traditional Fishing Craft and Gear

In olden days, the main fishing gear were shore seines, boat seines, lift nets, hook and lines and tidal barriers. They were operated throughout the year to catch whatever species of fish were available.

With the change from subsistence economy to market economy and with an increased and specified demand at home and abroad for fish and prawns, a process of specialization and diversification of artisanal fishing technology has been initiated.

Gillnets of various mesh sizes and designs have been introduced by artisanal fishermen on a large scale all along the coastline of Orissa. They catch different varieties of fish during the different seasons of the year and are very well adapted to the sea conditions prevailing in the various areas along the coast.

Little by little synthetic fibres have almost completely replaced natural fibres in the construction of netting, ropes, floats etc.

Encircling nets have undergone changes, too. Different nets of different mesh sizes and designs are used in different



2-section teppa



Launching a teppa



Podhua



Nava

areas. Natural fibres have been gradually replaced by synthetic fibres.

The same applies to tidal wall nets, too.

The relevance of such traditional gear as beach seines, boat seines, lift nets and hook and line has been reduced to a large extent even though they are still used. These 'old-fashioned' gear are still made of natural fibres such as cotton, hemp, etc.

To operate the wide variety of fishing gear presently used by artisanal marine fisherfolk, various types of boats have been developed; there are differences in their size, carrying capacity, seaworthiness and other factors.

The table on page 38 shows the distribution of traditional fishing craft and gear in the four coastal districts of Orissa.

The table illustrates the differences in fishing craft and gear between the southern districts of Ganjam, Puri and South Cuttack and the northern districts of Balasore and North Cuttack, which have been described earlier. Kattumarams, Bar boats and Navas are operated in the south, while in the north are various types of plank-built displacement craft of which the most widely used are Dinghies and Drngas. Regarding gear, small and medium mesh size gillnets for sardines, anchovies, mackerels, prawns, etc., are used in the south, while medium and large size gillnets for hilsa, pomfret, jewfish, perches, threadfins and other larger species are operated in the north.

The table also shows that the typical gear of North Orissa are encircling nets, tidal wall nets and set bag nets, while lift nets and boat seines are used exclusively in the south.

While beach seines are operated in South Orissa, shore seines are operated in North Orissa.

Furthermore, it is shown, that quantitatively gillnets have become by far the most important fishing gear, followed by tidal wall nets, boat seines, estuarine set bagnets, beach and shore seines, and encircling gillnets.

ITEM	D 1ST RI C5				TOTAL
	Ganjam	Pun	Cuttack	Balasore	
Kattumaram—Small					
Large			41		3977
Total			23		296
Bar-boat			93		231
Nava				87	87
Salti					1619
Dinghy/Danga			62	757	787
Patia/Botali				787	159
Chhoat			5	154	83
Motorised gilinetter			16	67	
Total No. of boats	2959	1288	1140	1852	7239
Small mesh gillnets (2-4 ems.) Katlala, Kavala, Kokuli, etc. in operational units	2168	294	74		2536
Medium mesh gillnets (5-6 ems.) Jagawala, Kilumala, Nyallala, Behundi etc. in operational units	2186	1041	466	1159	4852

Fishing Craft

Artisanal Marine Fisherfolk of Orissa

Fishing Gear	Large mesh gillnets (10 ems.) Phashi, Pedasilkiwala			7	2854	2861
	Very large mesh gillnets (15-20 cms.) Nakuda, Bhekti			63	10	73
	Total No. of drift/bottom gillnets in operational units	4354	1335	610	4023	10322
	Wallnets: Malo, Bedha				1545	1545
	Set bagnetS Behundi, Dhai ¹				705	705
	Beach seine, shore seines Bado, sarini, etc.	235	67	39	291	632
	Encircling gillnets Jangal, Khia badia				35	120
	Boatseifles Irgali	580	190	26		796
	Liftnets : Marala	102				102
	Total No. of gear in operational units	5271	1592	710	6684	14257

1. The set bagnetS mentioned in the table have not been described, because they are actually not marine but riverine or estuarine gear. Hook and line and cast nets are not included in the table because they were not covered by the census on which the table is based.

2.5 Fishermens' Perceptions of -their Marine Environment'

Fishermen's perceptions of their environment have been examined with regard to winds, cyclones, tides, currents, fish detection methods, fishing procedures and their relation to sea bottom, currents, winds etc., and concerning the peak periods of main fish species.

The information was gathered from fishermen in two areas along the coast of Orissa. These areas were Avana and Puri. Avana is a small secluded fishing village about 60 kms from Balasore in North Orissa. The majority of active fishermen in Avana have some arable land which provides them with a secondary income. Puri is itself a large town in South Orissa, The artisanal fisherfolk of Puri numbering approximately 10,000 live on or very near the sea shore, with fishing providing their only source of income. During the peak fishing season for prawns from November to January about 6,000 fisherfolk from Andhra Pradesh migrate to Puri, making it one of the biggest landing centres of artisanal marine fisheries in India.

Before discussing the fishermen's perceptions of their marine environment, a few points on the coastal features, fishing methods, main economic species and the fishermen themselves.

Avana : The coastal area of Avana is estuarine and has a large shallow continental shelf as a result of deposits from the river Ganges and other small rivers in the area. Because of this continental shelf the effect of the tide is felt greatly and it can be said that the fishing revolves around the tidal flow.

The fishing methods of the area are adapted to the physical structure of the coast. The main fishing gear used are surface gillnets, bottom gillnets, tidal wall nets, and fixed trap nets. Fishing is carried out in conjunction with the tidal flow i.e. the fishermen will set out with an ebbing tide and return with a

1. The terminology used by the fisherfolk to describe their environment does **not** necessarily conform to commonly spoken Telugu or Oriya words, as it is obvious in the case of winds, currents etc. To explain the reasons behind this phenomenon, is left to further linguistic studies.

flowing tide. This generally means that they will stay out overnight and return the next day because they have to travel a long distance.

The main economic catch of the area is Indian shad (Hilsa ilisha) and prawns (*Penaeus indicus* and *Penaeus monodon*), but when the fishermen speak about a good catch they are nearly always referring to the hilsa catch.

Regarding responsiveness the fishermen were generally reserved and it was found that the few bits of information they gave did not coincide in many cases. Their information differed mainly with regard to wind. This may have been due to shyness, mistrust, a lack of knowledge or an inability to communicate or a combination of these.

Puri/Pentakhota : Puri has a narrow continental shelf with consequently little tidal flow and a troublesome surf zone. The presence of the surf zone make it necessary for the fishermen to use a fishing craft which can withstand the harsh surf which frequently hammers the boat on the shore when they set out and return from fishing trips. Therefore, they use a strong but crude Kattumaram which consists of two to four logs held together by means of pegs and hemp rope and filled with a rudder, mast and sail.

Fishermen generally leave at an early hour 4-6 am, and return in the afternoon, 2-6 pm. They generally do not stay out fishing overnight, except during the period October-January when the surf is relatively calm and the 'nava' boat can be used. The nava is 9 metres in length.

The main fishing gear used in Puri are bottom set and drift nets and surface gillnets.

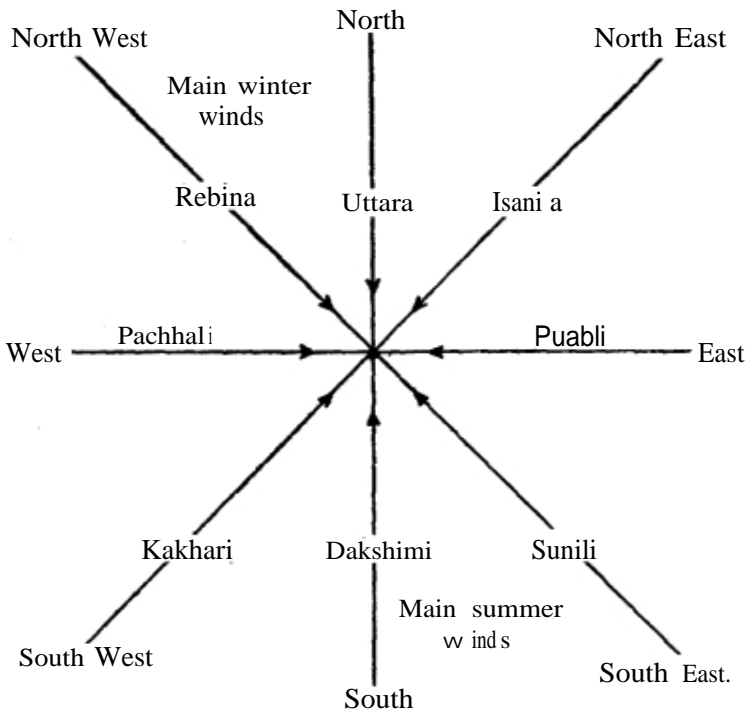
The main economic catch of the area is prawns, tiger and Indian prawns (*Penaeus monodon* and *Penaeus indicus*), and when fishermen speak of a good catch in Puri they are generally referring to the prawn catch.

The fishermen of Pun seemed to be much more responsive to questions than the men of Avana. They volunteered a lot of information and they were also more confident and fluent in delivering their answers.

2.5.1 Perceptions of Oriya Fisherfolk in North Orissa

– Winds

Although the fishermen of Avana, depend very much on the winds, for their livelihood they still gave conflicting accounts of when the winds blew and what their effects were. On the whole the following picture emerged.



During the summer the main winds which blow are the south and south-east winds. When the south wind blows the

fishermen will head out to sea and fish for that day and night, but if the south-east (onshore) wind blows which generally brings high waves, they will return to shore with that wind. When the south-west wind blows during the summer they will not venture out because the wind will carry them too far off shore, and there is no knowing when a favourable wind will blow. As the south-west wind is the predominant summer wind of India, during the summer months fishing is not generally good.

During the winter when fishing is at its best the main winds to blow are the north and north-west winds. The north wind brings calm weather and clear skies, and because of the relatively constant off-shore winds of the Bay of Bengal, upwelling also occurs enriching the whole area. If a north-west, west or south-west offshore wind blows during winter, the fishermen will go out fishing because they know that within a day or so the wind will change in their favour, enabling them to return to shore.

When the east onshore wind blows during spring and early summer the fishermen are restricted to fishing close to shore as the wind is unfavourable for travelling out to sea. At this time to get to the fishing grounds the fishermen use paddles and not sail.

-Cyclones

There are two seasons for cyclonic weather, the main one being between winter and summer when the north-east wind blows. During that time little or no fishing can be carried out. The other cyclonic wind is the north-west wind which generally just brings rain and this usually occurs between summer and winter. The fishermen can generally tell a day or two in advance when a cyclone is about to hit their coast. The usual signs which foretell the coming of a cyclone are :

- (1) Water spouts may be seen at sea a day or so in advance of the cyclone
- (2) Dark clouds begin to gather either in the north-east or north-west corners of the horizon
- (3) The fishing is bad a day or two before a cyclone i.e. no fish to be found

- (4) The smell of wet soil reaches their nostrils on the wind before the cyclone occurs
- (5) Some fishermen say they know a cyclone is coming from the sound the waves make when they hit the shore.

-Tides

The tides in northern Orissa have a major effect on the fishing pattern of the fishermen. The reason for this is the great tidal range which exists in that area as four kilometres of beach can be exposed during low tide. Each day of the lunar month is given a name signifying the importance of the lunar month and its effect on the tide.

Lunar month

English name	Local name
New Moon	Ama basya
1st lunar day	Pratipada
2nd lunar day	Dwitiya
3rd lunar day	Trutiya
4th lunar day	Chathurthi
5th lunar day	Panchami
6th lunar day	Shasthi
7th lunar day	Saptami
8th lunar day	Ashtami
9th lunar day	Nawami
10th lunar day	Dashami
11th lunar day	Ekadashi
12th lunar day	Dwadashi
13th lunar day	Trayodashi
14th lunar day	Chaturdashi
Full Moon	Purni ma

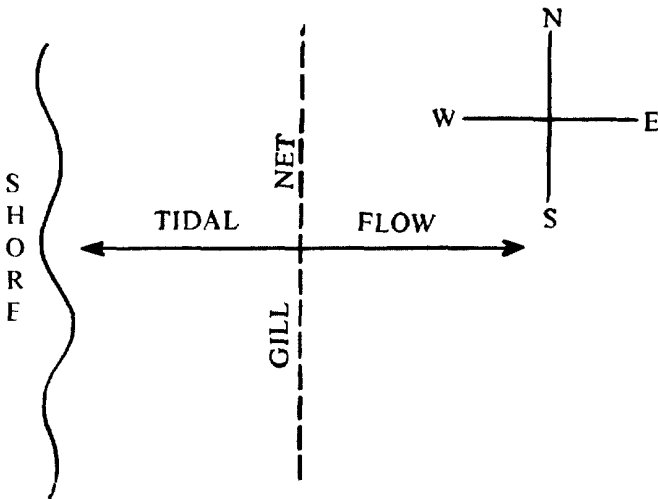
The same names are used again for the lunar days between the full moon and the new moon.

All the fishermen agreed that the best catch was obtained from the 11th lunar day to the 4th lunar day, with the new moon and the full moon nights bringing in the optimum catch. From

the 5th lunar day to the 10th lunar day the catches and the tidal flow were at their lowest.

It used to be an old custom in Avana not to go fishing during the new moon and full moon nights. The custom originated from the fear of boats capsizing in the high waves predominant at this time. This custom died as a result of financial pressures (still in existence) which forced the men to fish in these nights.

When they go fishing the men leave the village during the day, stay fishing overnight and return the next day. The fishermen have found that they obtain the maximum catch if they put their nets out just before the tide turns to go out during the 11th to the 4th lunar day period. The reason for this, according to the fishermen, is that fish swim with the tidal flow close to shore and return to the sea when the tide begins to recede. The fishermen place their nets parallel to the shore in a north-south direction, at right angles to the tidal flow.



It would be assumed that the best catch would be achieved on the new moon night, when the tidal flow is maximum, but this is not so. According to the perceptions of the fishermen, the fish can see the net on the new moon night, The explanation

might be that as a result of being disturbed by the nets the plankton glows and consequently shows up the position of the gill nets and so the fish avoid the nets. On full moon nights the light from the moon generally overpowers the light from the disturbed phosphorescent plankton, and reduces the visibility of the monofilament nets which are not easily visible in water. This phenomenon exists only when the water is clear i. e. during the winter period. When the fishermen were asked if they noticed any difference in catch between the new and the full moon period, when the water is muddy, March-August, they replied that they were unaware of any.

-Water Currents

The Avana fishermen do not go much by actual currents. They regard tidal flow as a current, and initially it was difficult to get them to distinguish between tidal flow and current. Once the distinction was made they had little to say about currents apart from these two observations :

- (1) Fish always swim with the current (including the tidal flow). The reasoning behind this is that when the tide comes over the large expanse of beach it brings the fish with it. As Avana fishermen first used fixed beach wall nets which caught the fish as the tide was receding the fishermen came to the conclusion that fish swim with the current i.e. fish came with the tide and left with the tide. Another fact which supports their theory is that when using a fixed bagnet in the rivers close to the sea, they catch fish only when the tide is receding and the fish swimming with the river are trapped by the bag as they swim towards the sea.
- (2) Once they were outside the effect of the tidal flow i.e. 10 km offshore, they found that the current always pulled them south. This does not coincide with the strong clockwise circulation of currents in spring, which would pull them north, but does coincide with the weaker anti-clockwise currents of the fall. They are not experiencing the spring clockwise currents because in the spring they do not go out beyond 5 km due to the predominantly east winds which keep them close to shore.

One conflicting point is that the same fishermen who said that they felt only the anti-clockwise current also said that when the current was heading north-east (clockwise) and accompanied by a north wind, the fishing was good. The reason might be that as wind and current were flowing in the same direction little or no tangling of nets occurred. Therefore, during the spring the fishermen must, on some days, go out to sea far enough to feel the northerly current.

-Fish Detection Methods

The fish detection methods of the fishermen of Avana are mainly those of sight and smell.

As hilsa is the most economic catch they spoke only about the detection of hilsa.

- (1) If the water is clear and has a green-blue-black colour it indicates a good catch.
- (2) If the surface of the water has a thin pink oily film, there will be much hilsa underneath the surface.
- (3) If the surface is oily and the water has a fishy smell, again there will be fish and not only hilsa.
- (4) Also there is the sound which the hilsa make as the shoal breaks the surface of the water.

They do not use the unjointed oar for fish detection as the men of Puri do.

-Fishing Procedure with regard to Sea Bottom, Current, Wind, etc.

The fishermen of Avana prefer fishing with surface gillnets

- (1) because the main catch is hilsa which is a pelagic fish and
- (2) because their nets do not get damaged as bottom set and drift nets sometimes do.

They have no specific places of preference of setting their nets but they find that the best place with regard to sea bottom

topography is a flat area, which seems to be a very vague statement, compared to that of the fishermen of Puri.

-Catch of Main Species throughout the Year.

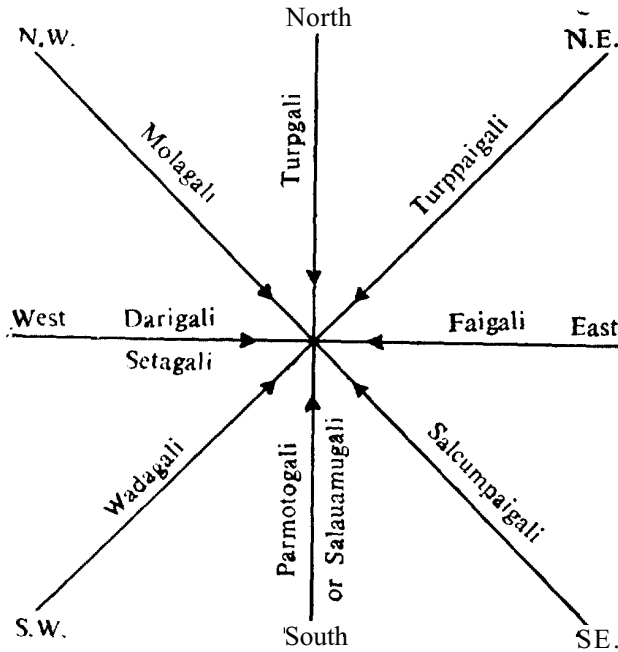
Regarding the peak periods of the main species the fishermen volunteered the following information :

Species' common name	Zoological name	Peak period
Indian Shad	Hilsa ilisha	August-September
Prawns	Penaeus indicus and Penaeus monodon	November-January
Clupeids	Hilsa toli	October-December
Silver Pomfret	Pampus argenteus	March-May
Black Pomfret	Parastromateus niger	October-December
Seer Fish	Scombreoides commerson	October-December
Silver Bar	Chirocentrus dorab	-do-
Bombay Duck	Harpodon ne hereus	-do-
Jew Fish	Othli thes argenteus	January-February
Ribbon Fish	Trichiurus savala	October-December
Indian Salmon	Eleotis fusca or Eleutheronema tetradactylus	October-December

2.5.2 Perception of Telugu Fisherfolk in South Orissa

The winds play an important role in the life of the Puri fishermen. They are aware of the winds and the effects which the winds have on the catch.

The predominant winds are shown below.



During the months October-February the main winds which blow are the Darigali and the Faigali. The west wind blows mainly during the night and in the morning, while the east wind blows mainly during the day and in the evening. According to the fishermen the times are approximately 12 midnight-12 noon for the Faigali. These winds are the normal sea breezes associated with coastal areas i.e. the alternating land and sea breezes. As opposed to the fishermen of Avana and Puri, these fishermen leave for fishing early in the morning with the west wind.

Darigali carrying them out to sea, and return to shore in the afternoon with the help of the east wind Faigali.

Occasionally during December the Molagali (north-west, wind) will blow between the Darigali (west wind) and the

(cast wind). The Molagali (north-west. wind) occurs only some days, but when it does appear it halts fishing because this strong wind upsets the nets and the boats so that fishing is generally halted for its duration. As with the Molapali (NW): the Turppaigali (NE) usually blows unannounced from November to January. Again fishing is sometimes halted because of strong winds which tend to capsize the boats and damage the nets. Generally in this strong wind (NE) the sails are not opened. If the Turppaigali (NE) blows gently as it sometimes does the fishermen say that it will result in a very good catch of prawns.

During the months October-February when the Darigali (W) and the Faigali (E) blow the fishing is good for both prawn and other species of fish.

During the months March-September the main winds which blow are the Salcumpaigali (SE), the Wadagali (SW) and Parmotogali (S). The Snlcumpaigali (SE) is a cool wind and the Wadagali (SW) is a warm wind. According to the fishermen the Wadagali (SW) makes the fish hide in the mud in order to keep themselves cool. This is their reasoning behind the observation that during the period April-September hand-to-mouth fishing is all they can hope for. It is these constant offshore winds that bring about upwelling which replenishes the nutrient stocks of the water. The nearshore upwelling zone not only has a high yield of nutrients, but also is a high primary production area for phytoplankton and related zooplankton.

This occurs in the north-east part of the Bay of Bengal during the north-east winds and on the west side during the south-west winds. Therefore, organic production is high along these coasts from early to late winter respectively.

These nutrients are slowly depleted so that by spring and early summer organic production is at a low ebb again as upwelling does not occur along the coast during the winter. The low to moderate catch of fish during March-September is a result of low organic production in summer, not because the fish hide to protect themselves from the hot south-west winds. Also the cyclonic weather which prevails from August to September prevents the fishermen

from going to sea, and also decreases the level of salinity in the Bay leading to an environment unfavourable for marine fish.

Regarding the causation of winds the fishermen believe strong winds to be the work of the devil who is out to get their boats. Also, the two goddesses Cbingamaru and Banamaru will stop boats moving in the sea, even though the crew may be paddling with oars (effect of current).

Once a year the fishermen set afloat a model boat filled with cigarettes, biscuits etc. as an offering to these goddesses and hope that they will accept the model boat and leave their own fishing boats in peace.

-Prediction of Rain and Cyclones

Generally the fishermen can tell that rain is coming by looking at the clouds on the horizon. When fishing, if dark clouds are seen on the west side they will immediately stop fishing and head home (westward). If clouds are seen in the east they will continue fishing until **just** before the rains come as the wind which will be blowing towards the west will carry them to the shore.

These fishermen as well as the Avana fishermen hold that the following signs herald the coming of a cyclone :

- (1) Water spouts precede cyclones anywhere from 4 hours to 1 day.
- (2) Dark clouds in either the north-east or the north-west.
- (3) Their nets become infested by jelly-fish one or two days before a cyclone.
- (4) White large clouds on the horizon accompanied by wind from the clouds indicate a heavy storm (not necessarily a cyclone).
- (5) A soft wind will blow in a direction opposite to that of the path of the cyclone.
- (6) Some fishermen are again able to predict a cyclone from the sound of the waves breaking on the beach, the shape and the size of the waves also act as an indicator. The Puri fishermen say that they can predict any wind from the special noise the waves make before the onset of the wind.

The Newaredi (West) and the Karakutodi (east) which the fishermen call currents are presumably the effect of the tidal flow and wind direction, because the fishermen say that they occur throughout the year, but are specially noted during the full moon and new moon periods.

When either of these currents flows the fishermen say that they do not catch fish either close to shore or out at sea.

As opposed to the Avana fishermen, the fishermen of Puri believe that fish swim against the current. Their reasoning stems from a story which tells how fish live in a mud house in the bottom of the sea. The fish are safe while they are in their houses, but when they come out the current drags them away from their home. Therefore, when the fish are caught in the nets they are always swimming against the current in order to return to their homes.

The fishermen do feel the currents which move north-east, north-west, south-east and south-west but they say they are insignificant and have not been given any names.

Fishermen also say that if there is no current they will not be able to catch any fish.

- *Tides*

The effect of the tide has little influence on the fishermen of Puri, the reason being the narrow belt of shallow water which runs along their coast. This narrow continental shelf drops off quickly to deeper water, thus absorbing the tidal flow. The main influence of the tide on the fishermen is that it either helps or hinders them while launching their boats.

Receding tide and low tide are called Padi, while advancing tide and high tide are called Neeri.

Like most coastal people they are also aware of the influence the moon has on the tides i.e. a more forceful tide and new and full moon periods. Apart from the above-mentioned facts the fishermen seem to dismiss the tides as not worth discussion.

-Special Fish Detection Methods

The fishermen of Puri have an ingenious method of detecting the presence of fish and their prize catch, prawns, in the sea.

1. With the aid of a single unjointed wooden oar, the broad end placed in the water and the narrow end held close to the ear, the fishermen can say what type of fish, if any, are present below the water surface. The oar must be kept clear of contact with the boat in order that a clear undisturbed sound can be heard. Each fish gives off its own distinctive sound, except for mackerel and pomfret which according to the fishermen are silent.

Below is an attempt to write what some of the sounds are and what each sound represents :

1. Chit bit, chit bit, chit bit.

There are prawns on the sea bottom, but the prawns have dug themselves in so there will be no catch.

2. Sheeeeeeee. high to medium pitch

This sound indicates that prawns are on the move and if the net is put out, the catch will be good.

3. Quack, quack....

This sound heralds the presence of fish, such as Megalops (tarpon), Chirocentrus (silver bar) and Techysurus (catfish) but not prawns.

This method is mainly used for the detection of bottom-dwelling fish.

For the detection of pelagic fish the usual methods are employed i.e. sight and sound. Shoals of sardine are seen as dark patches on the sea surface and often they are heard as they break the surface of the water. The fishermen say the sound resembles that of rain falling on the sea surface. No matter when this sound is heard, the fishermen will drop everything and rush to put out their nets once they see the shoal as a black area in the sea.

One of the beliefs of the fishermen concerning the irregular occurrence of pelagic fish is that all pelagic fish live in a big mountain covered with seaweed in the deep ocean. When strong winds blow the fish come to the surface but their home is in the seaweed on the mountain. They associate strong winds with pelagic fish because a strong south-east wind bring with it tarpon, silver-bar, hilsa, spotted spanish mackerel and black pomfret, while a strong north wind brings tiger and white prawns, ribbon fish, silver belly and jew fish.

The birds called Kali Peta (potipetu male, bandava female) are protected by the fishermen because when they appear in a flock of 15-50 sitting on the water surface the fishermen know that they will find fish in that area. The fishermen will again use the oar to listen for the type of fish underneath the birds and if the sound is favourable they will cast their nets.

These birds also indicate to the fishermen when their nets are full because they then start diving on the nets to eat the fish snared by the nets

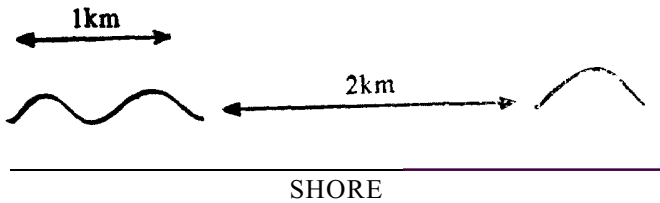
The fishermen were not aware that oil floating on the water surface could be an indicator of the fish.

-Fishing procedures with regard to sea bottom, current, wind etc.

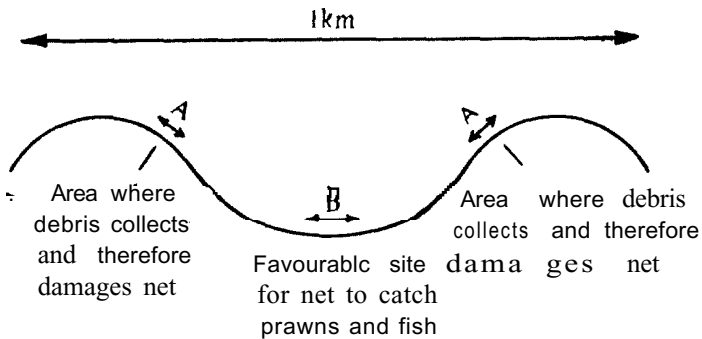
When fishing, the fishermen first have to cross the surf zone, then taking into account the wind and current, they will head for a position which they have fixed from land marks and where they know the fishing is good. Having reached the good fishing area, they will drop a line and sinker to measure the depth of water and to assess the composition of the sea bed.

Composition of sea bed	Type of catch expected
Sand	Few prawns and fish and many spiral shelled snails which entangle themselves in the net causing much damage. Not a good area to place net.
Sand and mud	Prawn and other fish, but not many of either.
Mud	Especially good for prawns and other fish.

The most common method of fishing in Puri is that of bottom set and drift gillnet. The fishermen have their favoured fishing sites. There are two just off the coast of Puri approximately 2 km from the shore at a depth of approximately 4-12 fathoms.



The diagram shows these two areas approximately 2 km apart, the tops of these mounds are approximately 4 fathoms from the surface while the depression and sea bed at the base of the mounds measure 8-12 fathoms.



The mounds run parallel to the coast and so do the north and south currents, with the current at its strongest in the valley. The fishermen set their nets at right angles to the current i.e. in an east-west direction. If the current is flowing in an east-west direction it sometimes happens that the fishermen cannot place their nets at right angles to the current as they may lose or damage their nets on the debris areas marked A. The two areas mentioned are not the only areas where fishing is carried out, but they are favoured spots. There are other areas where the sea bed is favourable

for fishing and the fishermen may go to depths of 45-50 fathoms offshore in order to reach them, but the usual depth is 20-30 fathoms.

In Section A of the diagram, where there is a large collection of debris, baited hook and line fishing used to be carried out until June 1984 when the fishermen decided among themselves to ban hook and line fishing. The principle behind this ban was that a baited hook and line generally caught shark and the fishermen believe that when a shark is in the water, especially one that has been injured by the hook, the blood and the presence of the shark frightens all other marine creatures away, Therefore the banning of baited hook and line fishing is an attempt not to attract sharks to the area. This ban resulted from a low catch of prawn during the end of 1953 and beginning of 1981 and the fishermen blame the sharks for this low catch. The fishermen catch shark with a large mesh gillnet only during the months of November-January when they can take out the nava boat which is larger than the log kattumarams. During the rest of the year when the surf is high the kattumarams cannot accommodate the catch from the Large mesh gillnets. This, therefore, explains why they don't catch shark with large mesh gill nets so as to reduce the population of shark in the area. Consequently they have resorted to banning hook and line as the only answer because as they cannot deplete the population they feel at least they should not attract shark to the area with a baited hook. It is not a satisfactory solution, but the only one available to them, and also it is unlikely that sharks are the sole reason for the low prawn catch of 1983.

Surface gillnets are used to catch the pelagic fish. During winter the fishermen like to place their net 2-3 km away from the mouth of the Puri canal (Nuanai) because they find that there they catch such species as grey mullet, mullet, giant perch, big sea bream, giant herring and Indian shad.

Most of the time the fishermen wait until they sight a shoal to put out their nets or else, when the strong south-east wind blows or the north winds blow they bring with them tarpon, silver-bar, hilsa, spotted Spanish mackerel, pomfret, ribbon fish, silver belly and jewfish.

Surface gillnet fishing is often carried out during the day but the nets are also left out overnight during the months of October-January from the Nava boats.

When fishermen fish at night, they navigate and tell the time by stars. They do not go out of sight of the Puri and Konarak lighthouses which also help them in their navigation. But it must be remembered that the main navigational aids at night for the fishermen are the stars.

-Catch of Main Species throughout the Year

Regarding the peak periods of the main species the fishermen volunteered the following information.

Species common name	Zoological name	Peak Period	Lean Period
Prawns	Penaeus indicus Penaeus monodon	August-Nov.	Dec.-Feb.
Mackerel	Scomberoides Rastrelliger	April-June	July-Sept.
Tarpon	Megalops cyphronoi	March-Sept.	Sept.-Dec.
Pomfret	Pampus argenteus Chilensis	Oct.-Dec.	Jan.-March
Sardines	Anchoviella commersoni Anchoviella tri	Oct.-Feb.	March-April

The differences in perceptions and knowledge of the marine environment between the Oriya fisherfolk of Avana, North Orissa, and the Telugu fisherfolk of Puri, South Orissa, clearly reflect the ecological differences as well as the different fishing techniques employed. This is shown by the lack of knowledge of the Oriya fisherfolk about sea bottom configurations, currents and detecting methods for bottom-dwelling fish and their elaborate knowledge of tides. Furthermore, there is a difference in the depth of their knowledge between those groups of fisherfolk. Owing to their longer association with sea fishing, the Telugu fisherfolk of South Orissa have more elaborate and realistic perceptions and knowledge of winds, navigation and other aspects of sea fishing.

CHAPTER 3

Ethnical and Socio-Cultural Background of Marine Fishing Communities in Orissa

by M. H. Kalavathy

3.1 Caste Background of Artisanal Fisherfolk

The southern coast of Orissa differs from the northern coast not only with regard to oceanographical features, marine resources and fishing technology but also with regard to the cultural and ethnical origins of the people who have settled along the seashore and make a living from fishing in the sea. While the tradition of sea-fishing in the southern district of Ganjam is as old as that in the southern states of Tamil Nadu and Andhra Pradesh, sea-fishing started much later in the northern districts of Orissa, stimulated by an increased demand for marine fish from other Indian states and cities, in particular from Calcutta, and by export prospects for prawns. The vast majority of the population of Orissa itself until today has not yet cultivated a palate for marine fish,

3.1.1 Fisherfolk Castes of South Orissa

The vast majority of the artisanal marine fisherfolk of Ganjam. Puri and parts of Cuttack district, in South Orissa locally referred to as Noliyas, are of Telugu origin. They belong to communities which have been fishing for 1000 and more years, as referred to in literature of the early Christian era (Venkataswamy Nattar 1927) and from the south during the past few decades they spread out to Puri and the southern part of Cuttack district. Noliya is an ancient Tamil word dating nearly 1500 years back according to the Sangam literature (Venkataswamy Nattar, 1927).

The fisherfolk referred to as Noliyas belong to two different castes, namely Jalaris and Vodabalijas.

The name Jalaris relates to the word Jala which means net. In Orissa, Jalaris are concentrated in Ganjam district. Some have also migrated to Puri and Cuttack district. Jalaris also reside along the coastline of Andhra Pradesh, particularly in the districts of Visakhapatnam and Srikakulam.

Among Jalaris there are two distinct groups, viz. the Edu Ratla group and the Pardrevdu Ratla group who do not intermarry but interdine. Otherwise they do not differ much in their habits and customs.

Jalaris live in hamlets very close to the sea-shore. The hamlets usually consist of streets, with houses or huts on either side. The men are exclusively engaged in marine fishing while the women are involved in the marketing of fish. During the sowing and the harvesting season some women also work as agricultural labourers and coolies. Jalaris who live close to Chilka lake possess nets and traps for fishing in the lake. They practise estuarine fishing during the lean seasons in marine fishing.

Jalaris usually own boats and nets and only a small group not owning any assets work as labourers for others who own boats and nets.

During the survey, only one of the four fishing villages studied in South Orissa was inhabited by Jalaris. 85% of all the families in the village were boat and net owners while only 12% worked as labourers.

The Jalaris have a caste council which consists of eight members. The head of the council is called Paddhanau. The membership of the caste council is hereditary.

The council controls all the social and economic affairs of the village. It decides on fishing holidays, ban of certain types of fishing gear, settles disputes connected with marriages, inheritance etc., supervises important social functions like puberty, marriage, death and religious ceremonies, collects village funds for various purposes, levies punishments on guilty persons, arranges aid during

lean seasons in fishing and in times of natural calamities and deals with institutions outside the village such as police, government agencies etc.

Like Jalaris, members of Vodabalijas, the second Telugu speaking fisherfolk caste, reside in South Orissa and are also found in great numbers in the Visakhapatnam and Srikakulam districts of Andhra Pradesh as well as in other parts of the southern districts of the state. They are not mainly confined to Ganjam district as Jalaris are but have spread all along the coastline of Puri and the southern part of Cuttack district, too. Out of the four villages studied in South Orissa, three were settlements of Vodabalijas. Other observation made by officers of the Fisheries Department regarding the caste of Telugu speaking fisherfolk indicate, too, that Vodabalijas are more numerous than Jalaris in Orissa.

The settlements of Vodabalijas are large, having many streets and lanes. Like Jalaris, Vodabalija men are exclusively engaged in fishing while the women are involved in fish marketing.

In some areas Oriya fisherfolk castes such as Keotos or Kevitos have taken over marketing and small-scale processing of fish, which consequently reduced the role of Vodabalija and also of Jalari women in fish marketing.

Vodabalijas regulate their social and economic affairs with the help of a caste council, locally called Kulasamidhi. The head of the council is known as Kula pilla. The number of members differs from village to village, but is generally about five. The membership is hereditary. The functions of the caste council are similar to those of the Jalaris' council.

Apart from Jalaris and Vodabalijas, ethnically Oriya fisherfolk castes e.g. Gokhas and Kaibartas as well as some traditional agriculturists are also practising marine fishing in a few locations in Ganjam and Puri districts and in the southern part of Cuttack district. For the most part, members of these castes are either confined to beach seine operations very close to the shore or depend on a river mouth to launch their boats, since they are not used to operating fishing craft and gear from open

surf-beaten beaches, except for one location, a village named Jahania south of Astrang in Puri district where Oriya fisherfolk practise sea-fishing with kattumarams, locally called 'teppa', which are traditionally used by South Indian fisherfolk. The fisherfolk of this location, however, have their origin not only in the Kaibarta and Khanda castes but also in the Telugu fisherfolk, who had been invited in the second half of the 18th century by the ruler of Machogan, Basudev Mangaraj, to settle at the mouth of the river Devi, to serve him as pirates.

3.1.2 Caste Background of Fisherfolk of North Orissa

Numerous castes have taken to sea-fishing in Balasore and in the northern part of Cuttack district during the last few decades. Those who were originally practising estuarine and inland fishing were the first ones. Later members from other castes with traditional occupations such as those of agriculturists, artisans etc. followed.

Traditional riverine and estuarine fisherfolk castes of North Orissa are Kaibarta, Gokha and Rajbansi while the non-traditional fisherfolk castes which are now practising sea-fishing comprise Harayans, Khandayat, Radhi, Teli, Ganda, Barik and Kumar.

Kaibarta is the largest traditional Oriya fisherfolk caste found mainly in Balasore district.

The name Kaibarta is synonymous with Kewat or Keota. Kaibartas are divided into two subcastes : Chasi Kaibarta and Jalia Kaibarta or Adi Kaibarta. Chasi Kaibartas have traditionally been peasants and are usually considered superior to Jalia Kaibartas, who have been traditionally engaged in riverine and estuarine fishing (See Thompson 1921, p. 358 and Russel Atiralal 1916, p. 370). Nowadays Chasi Kaibartas are also engaged in sea-fishing. They have titles like Behera, Majhi, Das, Senapathi, Khatua, Burmanik etc. It is not clearly known when Kaibartas took up sea-fishing but it can be assumed that it took place some 60 years ago. Besides fishing, Jalia Kaibartas also cultivate land. Their women are not involved in fish marketing but sometimes in net mending and processing of fish.

There are also Bengali Kaibartas. Some of them have migrated to Orissa and practise marine fishing in Balasore district. It is not exactly known to which subcaste they belong. They claim, however, fishing as their traditional caste occupation.

Kaibartas are usually net or boat owners. Comparatively a few work as free or contract labourers. Kaibartas are often described as the most enterprising of the Oriya and Bengali fisherfolk groups who have adopted new fishing methods, ventured into new fishing grounds, arranged for the marketing of fish etc.

Another traditional fisherfolk caste that practises sea-fishing in North Orissa is Rajbansi also referred to as Jiyar, The number of Rajbansis engaged in marine fishing is much smaller than the number of Kaibartas and Gokhas. There are Oriya Rajbansis and Bengali Rajbansis,¹ the latter having migrated from East Bengal, at the time of the partition of Bengal, to the 24 Parganas in West Bengal and from there to Orissa. Rajbansis have titles such as Barman, Mandal, Singh and Patra. They are referred to as Kshatriyas. Before taking up sea-fishing Rajbansis were engaged in inland fishing² and also worked as agricultural labourers.³

While their major occupation has become fishing, Rajbansis usually also own a few acres of agricultural land, which they cultivate either themselves or with the help of labourers.

Their women are not involved in any activity which is related to fishing. Of those which have other traditional occupations than fishing and which are at present practising sea-fishing in Orissa, Khandayat is the largest.

Traditionally Khandayats are peasants. They have entered sea-fishing mainly by investing in fishing boats and nets the surplus money they have accumulated in agriculture.

1. A description of the fisherfolk of West Bengal is attempted in Men in India, 1969, Vol. 49, No. 3, pp 241-248.
2. See Thomson, 1921, pp 351 and also Manmohan 1901, pp 50.
3. Risley 1891, pp 375 holds the view that Rajbansis were originally agriculturists.

When fishing became more and more rewarding many Khandayats shifted the emphasis in their economic activity from agriculture to fishing. While in some areas Khandayats own boats and nets without actively participating in fishing operations themselves, in other areas they go out fishing in the sea, sometimes even as labourers in other boats and nets. An initial constraint in taking up sea-fishing might have been the fact that Khandayats rank higher in the caste hierarchy than Kaibartas and Gokhas and fishing is considered an inferior occupation compared to cultivation of land.

Those Khandayats who have taken to fishing usually still own agricultural land. Their titles are Nayak, Behera, Mohanty and Patras.

Other Oriya and Bengali castes which were originally engaged in the processing of agricultural products and members of which have recently taken up sea-fishing are Radhi, Teli and Gauda. The traditional occupations of these castes respectively are processing rice (the produce being called 'flattened rice'), extracting oil from mustard and gingelly seeds, and raising cattle and sheep. Members of these castes, which have a higher social status than traditional fisherfolk castes have entered fishing mainly as labourers in other boats or nets or as crew members owning net pieces. They have given up their traditional occupations because income from fishing is steadily increasing due to an increasing demand for fish and high prices while earnings from their traditional occupations are decreasing. Some Radhis, Telis and Gauda do fishing only as a part time occupation, depending on the demand for labourers by boat and net owners.

Titles of Radhis, Telis and Gaudas who have taken up sea-fishing are Jena, Nayak and Sahoo.

Another group of Oriya castes that has recently taken to sea-fishing has traditionally consisted of village artisans such as Kumar (blacksmith), Tanti (weaver) and Barik (barber). They shifted to a new occupation most likely for the same reasons as the Gaudas, Radhis and Telis. Compared to these castes they are more often owners of nets and boats which reflect their better economic situation, Titles of artisans who are engaged in sea-fishing are Mandal, Jena and Nath.



Telugu fishermen of Purl, South Orissa, carrying the catch to the shore



Telugu fishermen of Gopalpur-on-Sea with Kavalavala (gilinet)



— Kaibarta fishermen of Barajdeuli, Balasore district



Kaibarta fisherwomen of Gudubai, Balasore district

Apart from agricultural castes and artisans, Harijans are also engaged in marine fishing in North Orissa, both as labourers and as owners of net pieces.

Besides the castes mentioned above, which have taken to sea fishing as observed during the study, there are other traditional fisherfolk castes practising fishing in lakes¹ and rivers, and engaging themselves in the processing and marketing of fish or in making and selling fishing gear. e.g. Nikari, Jhora, Machua Kandra, Karita, Kuthra, Dandamayi, Ujia, Thosas Mala (or Mal Mallah).² Malas are traditionally boatmen, who practice fishing as a subsidiary occupation. Some Malas took up fishing later on as the primary profession and adopted the name 'Jalo', which means net. They fish mainly in rivers and estuaries.

Thoras are considered a sub-caste of Kaibartas. Besides fishing in ponds, lakes and rivers, Thoras have also been gold washers in the past. Ujias are mainly found in Balasore district as inland fisherfolk. Their name is derived from "Ujon", which means to swim.

Dandamayi, Nikari and Jhora are found in different parts of Orissa, fishing in lakes and rivers.

Karitas are found only in Puri district. Their social status is very low. Khatra is an allied caste which sells fish, caught by members of the former caste. Machua Kandra is a sub-caste of the low-ranking Kandra caste. The caste name is said to denote skill in archery. Machua Kandra are predominantly engaged in preparing and selling contrivances for catching fish.

The brief description of castes which are presently engaged in sea fishing in Orissa shows that the increased demand for fish has initiated a process of occupational mobility. Besides castes which have traditionally practised inland fishing, several non-fishing castes such as agriculturists, artisans and harayans ranking both

1. Oriya fishing communities who follow their occupation in the estuarine waters of Chilka lake and have not yet adapted themselves to sea fishing are described by Roy Choudhury (1977) in *Journal of the Indian Anthropological Society* 1977.
2. See K. G. Gupta 1907 and also G. S. Bhattacharya 1957.

higher and lower in the hierarchy of fisherfolk castes have also taken to sea fishing as another artisanal occupation.

This process of occupational mobility has, however, been limited to North Orissa. The reason is most probably that the operation of kattumarams from the surf-beaten beaches of South Orissa requires too many skills and experiences to be easily adopted by other castes as compared to the operation of displacement boats in the shallow inshore waters and estuaries of North Orissa.

Table 1 : Demographic data-districtwise

District	Ganjam	Puri	Cuttack	Balasore
1. Number of marine fishing villages.	29	16	7	184
2. Number of marine fisherfolk households-major time & minor time				
a. No. of households	4132	1766	1686	9260
Average no. of fisherfolk households per village	142.5	110.4	240.9	50.3
b. Average size of household	5.4	6.9	6.1	6.2
c. No. of major time fishing households	3831	1551	1460	7527
	(93%)	(88%)	(87%)	(81%)
Average no. of major time fishing households per village	132.1	96.9	208.6	40.9
d. No. of minor time fishing households	177	184	158	1657
	(4%)	(10%)	(11%)	(18%)
Average no. of minor time fishing households per village	6.1	11.5	25.4	9
e. No. of single old people households	124	25	48	76
	(3%)	(2%)	(2%)	(1%)
Average no. per village	4.3	1.6	6.9	0.5
3. Number of active fishermen	5880	3800	3202	17168

Even though it is not known how many fisherfolk belong to each caste, a rough idea can be obtained about the ratio of Telugu speaking fisherfolk and Oriya and Bengali speaking fisherfolk.

The table above shows the number of artisanal fisherfolk households practising sea fishing in the four coastal districts of Orissa.

While in Puri and Ganjam districts sea fishing is carried out almost exclusively by Vodabaliyas and Jalaris, along with a small number of Gokhas, in Balasore district, Oriya and Bengali fisherfolk castes as well as traditional agriculturists, artisans and harayans are engaged in sea fishing.

Cuttack district has Telugu speaking as well as Bengali and Oriya speaking marine fisherfolk.

3.2 Habitation and Settlement Pattern

3.2.1. Habitation and Settlement Pattern of Fisherfolk in North Orissa

The settlements of artisanal marine fisherfolk look quite different in North and South Orissa and thereby reflect the ecological, geographical and ethnic cultural differences described earlier. Fisherfolk in North Orissa, e.g. Balasore district and the northern part of Cuttack district, live in hamlets that are usually part of larger agricultural villages. They are situated either by a river at some distance from the sea, or, in the absence of a river, at a site where agricultural land or at least land suitable for a kitchen garden is available, which again is usually the case only at some distance from the sea shore. Thus fishing villages in North Orissa are generally situated in the middle of a rich vegetation of various types of fruit trees, bamboo groves, palm trees, vegetable gardens and fish ponds, preferably beside a river. Paddy fields and plantations of other crops extend to the sides of the villages, which easily remind us of the agricultural and inland fisheries origins of their inhabitants who, even though practising sea fishing now-a-days as their primary occupation, still follow their traditional occupation of fishing in rivers and cultivating land.

Another feature that clearly distinguishes fisherfolk villages in the north from those in the south is the absence of such fishing activities as launching and landing of boats, unloading of catch, selling of fish to merchants, processing of fish for sale etc., because the village and the landing site are not identical in North Orissa. In the case of villages which are situated upstream, boats and crew operate during the fishing season from temporary camps at the rivermouth, where the catch is also sold. Crew members take turns to visit the village in order to procure food and other supplies as well as to look after their families. Children and women do not visit the fishing camp.

In the case of those villages which are not situated by a river but at some distance from the shore, the fishing activities mentioned above are not very noticeable either. The boats are kept on the shore, which is separated from the village by extensive casuarina plantations as well as by saline lands.

During the fishing season the boats usually do not land at those sites where they are kept but at larger landing sites in rivermouths having good communication links and frequented by a number of fish merchants.

Another feature which distinguishes fisherfolk settlements in North Orissa from those in South Orissa is again based on their different ethnical and cultural backgrounds. Since the fisherfolk of the north belong to both fishing and non-fishing castes, with each one occupying a different status in the caste hierarchy, their houses are not clumped together in a particular part of the village but widely scattered.

The houses themselves are usually situated in the middle of a spacious compound. Compound walls rarely exist. Thorny shrubs, dry bushes or bamboo fences denote the boundary. Inside the compound one can see houses and sheds of different sizes, a small pond, a flat open courtyard with a mud floor, a kitchen garden, various fruit trees and thick bamboo bushes. The largest house serves as living place. It has usually three or more rooms and a wide verandah all around. A separate smaller hut sometimes serves as kitchen if it is not accommodated in the main house. Another

hut may be used as cow or goat shed, another one for husking paddy. Sometimes attached to the main house is a poultry house, where fishing gear and food stuff are also stored. The houses and huts have clay walls, the largest ones sometimes brickwalls. The roofs are thatched with straw, the living place is sometimes roofed over with tiles. The wide open level mud floor is used for drying unmarketable fish. The types of houses and compounds described above are located either on both sides of a village road or in a more scattered way, surrounded by pathways.

Another type of settlement of the Oriya fisherfolk in North Orissa is represented by street houses which directly border the village street. The houses are not separated from each other and from the road by compounds or fences but the houses have common walls, thus forming a long stretch of buildings on both sides of the roads, having raised verandahs under their thatched roofs.

The street house itself serves only as an ante-chamber through which one proceeds to the elongated main house, which consists of a series of rooms one after another, having verandahs in front. All main houses are built at a right angle to the row of street houses, the back of each main house forming the boundary of the elongated rectangular courtyard of the house at the rear. The main house leads to a separate kitchen shed behind which a kitchen garden is located. The ante-chamber is used for husking paddy and for storing firewood and other materials. The main house contains living rooms for members of the usually extended families. In these rooms, fishing gear, food stuff, utensils and other valuable items are kept.

On the whole the houses of the Oriya and the Bengali fisherfolk are not very much different from the houses of the agriculturists, which is really not surprising, because even the traditional fisherfolk castes such as Kaibarta, Cokha and Rajbansis have been regularly engaged in agricultural activities during lean seasons while others who are now practising sea fishing were once agriculturists by caste.

3.2.2 Habitation and Settlement Pattern of Fisherfolk in South Orissa

In South Orissa with its wide, open beaches and scarce vegetation along the coastline and its fisherfolk fishing in the sea from time immemorial, having no agricultural origin whatsoever and no tradition in river fishing either, the settlements of the marine fisherfolk are situated in most cases almost directly on the beach or very close to it on sandy ground with hardly any vegetation, not to speak of agricultural land or kitchen gardens. The beach in front of the huts serves as landing place, initial market place for the fish, a place for drying kattumaram logs and fishing gear as well as for net mending and other activities.

Fishing hamlets in South Orissa are generally of two types. The first type is mainly represented by settlements which have been formed by fisherfolk who have migrated recently, which means during the last few decades from Andhra Pradesh or Ganjam district to Puri district and the southern part of Cuttack district and are residing on land almost on the beach which is owned by the government and has not been allotted to them. These settlements consist mainly of make-shift huts which are arranged haphazardly. Many of the huts do not have side walls and are constructed like a tent using only wooden poles and palm leaves.

The second type of fisherfolk hamlet in South Orissa is inhabited by those fisherfolk who have been residing there already for a long period, having had the opportunity of choosing the location of their villages. As it is also the case with make-shift huts mentioned above, the fisherfolk hamlets are separate settlements and do not form a part of agricultural villages.

A well established fishing hamlet in the south has one or two main streets, and a number of lanes and side streets. The main streets are occupied by families of well-to-do fisherfolk owning several boats and nets or by families that were well-to-do in the past. The houses usually have clay or mud walls, in some cases even brick walls, and are much smaller than fisherfolk houses in the north. The clay and mud walled houses have thatched roofs of straw or palm leaves, the latter marking a better economic status,

while the houses with brick walls have usually asbestos roofs. All houses are generally street houses with a very small compound at the back. Sometimes palm thatchings are used to mark the boundaries between the houses at the rear.

The space being limited, in some villages the houses have a paddy storing place below the roof.

The interior of the house is usually divided by partition walls into three rooms. The inner room serves as a bed and store room. The other two rooms open onto the front and the back of the house. One of the outer rooms leads to a kitchen, which however is used only during the rainy season.

The cooking is done on ovens which are arranged in a double row in the middle of each street. The huts have a raised verandah known as 'Arugu'. The verandah is used to keep the net and other fishing accessories. It is also used as a place of rest and a meeting-place for family members and neighbours. Some houses have a small backyard garden, in which a few plants like pumpkin creepers, one or two coconut trees and some flowers are grown. In comparing settlement patterns and housing conditions between South and North Orissa and between the Telugu and the Oriya/Bengali fisherfolk, it should be kept in mind that the latter groups have been for ages permanent settlers of the soil, depending partly on agricultural land for their living, while the Telugu fisherfolk never knew such binding to the soil but traditionally keep shifting in search of new fishing grounds.

As described above, the settlements of marine fisherfolk in Orissa are either isolated hamlets scattered along the coast or part of agricultural villages, which are often situated at the side of a river. In both cases access to infrastructural facilities becomes a problem.

3.2.3 Infrastructural Facilities

Common features of the 29 settlements of artisanal fisherfolk in the southernmost Ganjam district are the absence of clinics and primary health centres and hospitals within a reasonable distance from the fishing village, the lack of electricity, the absence of secondary schools as well as the lack of functioning tubewells.

Drinking water is usually taken from open wells which are exposed to contamination. In some areas such as Chatrapur, wells dry up seasonally which causes serious water problems.

With regard to primary schools and road communication, the villages of the artisanal fisherfolk are better off. Primary **schools** are located within easy walking distance of almost all settlements, even though their capacity is not sufficient, considering the number of children of school-going age.

In the northern and central parts of Ganjam district the fishing villages are usually connected by motorable roads. Most of the hamlets in the southern part, however, can be reached only after walking for miles on sandy footpaths, which submerge under water during the rainy season. In some cases creeks and small rivers have to be crossed.

Except for those fisherfolk settlements within the municipal area of Puri town, the 17 fishing villages of Puri district lack almost all infrastructural facilities such as tube wells, primary health centres and clinics, electricity and roads, and are worse off than the fishing villages in Ganjam district. The reason might be that these settlements were established much later than the villages in Ganjam district by fisherfolk who have migrated from Andhra Pradesh.

Similar is the situation in Cuttack district with its numerous rivers, creeks and estuaries, Roads which are motorable throughout the year are almost absent. In most cases rivers and creeks have to be crossed to reach the settlements. Tube wells are hardly to be found. Drinking water is taken from open wells, rivers and ponds. In some cases salinity of water becomes a problem during certain parts of the year. Clinics and secondary schools are not within reachable distance for most of the fishing villages of Cuttack district. Excepting one, none of the settlements is electrified.

In Balasore district the lack of modern health facilities within reachable distance from the fishing villages seems to be the major problem. At present primary health centres are the only significant institutions. Their number is, however, far too small

to play an effective role with regard to preventive and curative health care,

The lack of road communication is a problem in the northern part of the district.

Regarding schooling, a considerable number of fishing villages is still out of reach of primary schools. Secondary education is rarely available for the children of marine fisherfolk.

The situation with regard to drinking water Supply and supply of electricity is better than in the other three districts.

On the whole the majority of the settlements of artisanal marine fisherfolk in Orissa are still deprived of modern infrastructural facilities and services such as road communication, education, health care etc. and depend very much on their own resources. The relative isolation from modern social institutions should be kept in mind when evaluating their cultural and social interaction patterns as well as their attitudes and perceptions, later on.

3.3 Festivals and Rituals of the Telugu Fisherfolk of South Orissa

The religious rites that are performed and the deities that are worshipped by the fisherfolk of South Orissa reflect their folk culture as well as their adherence to the culture of the larger society. While the gods and goddesses of the Hindu great tradition do have a place in their worship, it is the local deities who play the most important role in the day-to-day life of the fisherfolk. Apart from this, fisherfolk practise ancestral cult too.

3.3. 1 Worship

Like other castes, the fisherfolk worship the important Hindu gods like Siva and Vishnu and believe in the philosophy of the Hindu religion. While they go to the nearest Siva and Vishnu temples during important festivals they also undertake pilgrimages to important temples like the Simhachalam Narasimha temple and the Tirupathi Venkateswara temple in Andhra Pradesh. Another important temple much revered and visited by them is the Jagannath temple at puri, Orissa.

Besides the important Hindu gods innumerable local deities mostly 'Ammavaaru's (mother goddesses) are worshipped. There are benevolent and malevolent deities. Among local deities the village deity which differs from village to village holds an important place of worship. Apart from this every family has its special family deity worshipped by its patrilineal ancestors. While the origin of the local deities is not known some mythological stories are told connecting them to gods of the Hindu great tradition.

The shrines of these deities vary in form from brick-walled shrines to a wooden pole or an inverted pot.

The most important of all local deities common not only among Telugu fisherfolk but also among Oriya and Bengali fisherfolk is Gangamma or Horochandiammavaari. The goddess is mythologically associated with Lord Siva. Even though she is the personification of the river Ganges, the same goddess is referred to by all the fisherfolk of Orissa as a sea goddess. This belief originates from the fisherfolk of North Orissa who traditionally were practising fishing in the tributaries and delta of the Ganges. Gangamma is worshipped in connection with most of the fishing rituals. She is supposed to wander in the sea protecting the fishermen on the sea and blessing them with a good catch. The shrine of Gangamma is a small brick or mud structure facing the sea. Inside this shrine or rather miniature shrine there is a wooden painted image dressed in red cloth. In the month of March or April, a festival is conducted for Gangamma with pomp by the whole village. It is believed that if this festival is not conducted, the deity will not be appeased: which will lead to poor catch. The festival of Gangamma is elaborately conducted, sacrifice of goat and chicken being a part of it. At the beginning of the pooja (worship) nets are stacked in front of the shrine by different families. After the sacrifice the blood is sprinkled on the nets. They also offer cloth to the deity. Pooja is conducted by offering flowers and coconuts and by lighting camphor. Everyday fisherfolk pray at the shrine before they go on fishing. In case there is a good catch, a pooja is conducted for Gangamma. They also vow to sacrifice a chicken if the catch turns to be good.



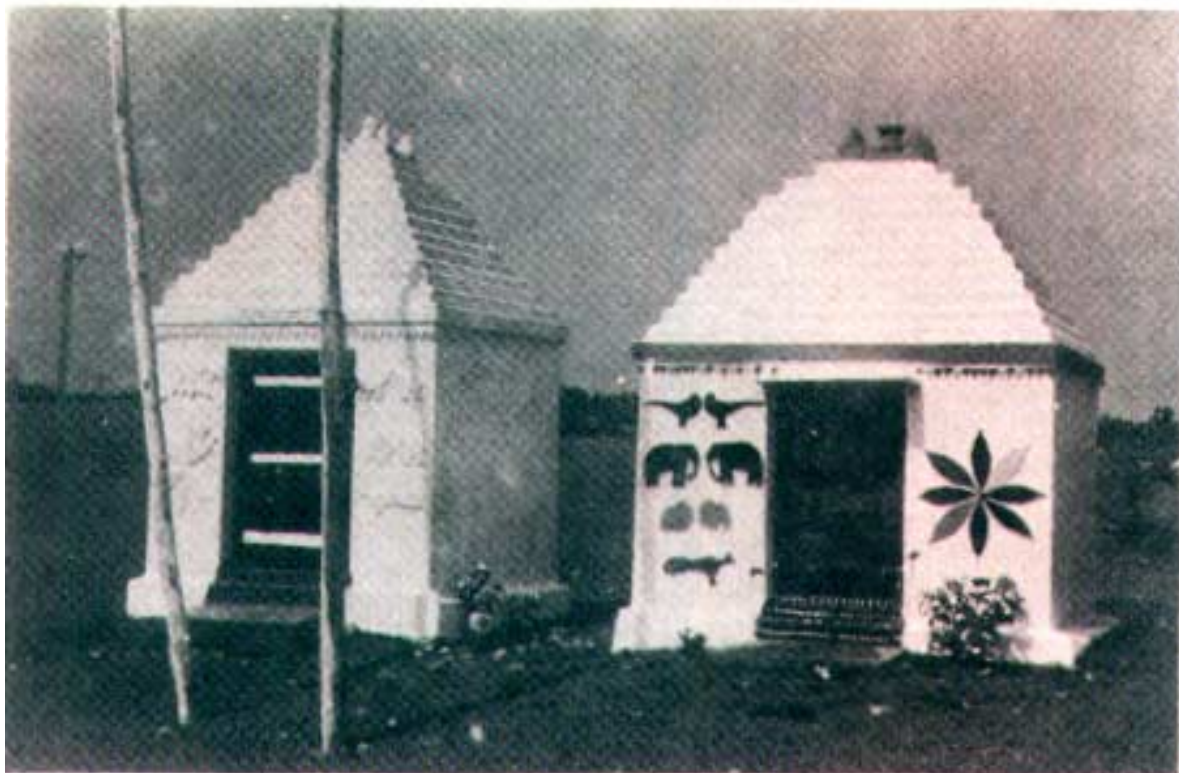
Estuarine fisherman with traps in Gudubai, Balasore district



Houses of traditional Oriya fisherfolk of Balasore district



Street-houses of Telugu fisherfolk in Gopalpur-on-Sea, Ganjam district



Shrines of Telugu fisherfolk in Gopalpur-on-Sea, Ganjam district

Apart from Gangamma a number of other local deities like Ammavariamamma, Poleramma, Rajamma, Rajappa, Yerenamma, Samalamma, Potiraju, Guruappa, Muthiyalammaavaaru, Neetiammaavaaru, Karalasaakthi or Kaal kaalka sakthi, Bhoelokiammavari, Nukalammaavaaru, Gangalaammavaaru, Enugasakthi etc. are worshipped. Some of these deities have more than one name. In a village different families have different shrines on the sea shore for the worship of different deities which they consider their family deity. The deities are represented by painted wooden images or wooden planks or poles erected only at the time of festivals or by stones or earthen pots buried in sand and marked with vermilion.

Among the deities mentioned earlier, Ammavariamamma, or Peddhaammavariamamma and Poleramma are referred to as village deities. A festival is conducted for Pedeaammavariamamma in the month of April. This festival is celebrated for the welfare of the villagers. The deity is taken from its usual place and kept in the centre of the village. Each day a celebration is undertaken by one of the well-to-do fisherfolk families which takes the deity to its house. On these days the family gives a feast to the whole village. In the morning and in the evening after being decorated the deity is taken around the villages. All the poojas are conducted by a fisherman-priest. This period of celebration is accompanied by 'Shandais' (weekly open markets) conducted in the village. No one goes fishing on these festive days.

Rajamma is another important deity worshipped by the Jalaris and Vodabalijas. In the miniature shrines on the sea shore Rajamma is represented by a female figure riding on an elephant and carrying a sword. She is supposed to bless barren women with children. She is also supposed to give good catches to devotees. The festival celebrated for Rajamma is similar to that for Ammavariamamma except in magnitude. Along with Rajamma, honoured during the festival is Rajappa, supposed to be her husband,

Important aspects of the festival are fire-walking and tonswing of barren women.

The deity Bhoelokiammavari is supposed to reside in the graveyard. She has no image. Sometimes, at the time of worship,

an earthen pot is dug into the mud, marked with vermilion, and worshipped. There is much fear of this goddess among the fisherfolk. She is supposed to inflict sudden death if she is not properly appeased.

The goddess Samalamma is supposed to protect fishermen from fever. Her image is represented by a red skirt and a green Coat.

The image of goddess Yerenamma is a woman sitting on a white horse with a sword. She is supposed to protect fishermen from drowning in the sea and from being caught by the shark.

Nukalammavaaru is the deity supposed to be responsible for cholera and small-pox.

Gangalammavaari is another sea goddess. She is worshipped for protection of nets and boats.

Kaalakasakthi is another goddess who is worshipped for good catches.

Enugasakthi is a deity supposed to cast evil spells if the deity is not propitiated with sacrifice. Both these goddesses are represented by pots only.

There are other deities worshipped, too, but it is clearly not known if each of them has a definite image and a separate origin. Sometimes a shrine for the village deity in a fishing village contains a huge number of different images. Most of the deities are not worshipped separately since they are mostly worshipped along with the main deity. While the village deities have the highest status, deities connected with diseases come next in importance. Another interesting factor to be finally mentioned is the worship of a deity named Bengali Babu, represented by a white man sitting on a horse. The origin of this deity is attributed to the influence of a colonial English officer who was benevolent to the fisherfolk (Thurston 1907).

Apart from these deities each family worships its ancestors with much awe. Sometimes images are made and kept along with the images of deities, Prayers to ancestors by means of burning

camphor by fishermen priests are considered to be necessary if catches continue to be small. Every festival performed for any of the deities also includes prayers to ancestors. In the miniature shrines along the shore painted wooden images of ancestors are kept to the left and right side of the main deities in a row. The festival of harvest, Makarasankaranthi, and Kothammavasai are celebrated by the Telugu fisherfolk as days of ancestral worship. Goat and chicken are sacrificed. Several eatables are prepared along with meat preparations at a temporary altar for ancestors.

3.3.2 Festivals

The Telugu fisherfolk of South Orissa celebrate mainly those festivals that are generally celebrated by south Indians. They celebrate one or two Oriya festivals, too. While the former are celebrated at home by the whole village, the latter are celebrated by visiting shrines and attending fairs.

Makarasankaranthi has to be mentioned as one of the important festivals of the fisherfolk. It is celebrated in the middle of January. The fisherfolk worship their ancestors and Gangamma, the goddess of the sea. Before this a small festival called Bhogi is celebrated when the fisherfolk dispose of all old things and do house cleaning. On the day of the festival, pooja is performed to invite the spirits of the ancestors to partake the food prepared by the family so that they may bless the offsprings and ensure the welfare of all the living members of the family. It is believed that if the ancestors are not appeased by this festival it may lead to poor fishing and illness among family members. Makarasankaranthi is the festival during which the rich and the poor cook meat. For this purpose they buy a goat a month or two before the festival, fatten it and sacrifice it during the festival. While the sacrifice of goat and chicken takes place at the altar of Gangamma, cooked food is kept at a special altar prepared at home. On the first day of the celebrations pots of new rice are cooked with jaggery.

In addition to the worship of ancestors, a pooja is conducted for Gangamma at the sea shore and fishing implements are kept near the shrine where goats or chicken are sacrificed and the blood is sprinkled on the nets. Pooja is conducted by burning camphor.

Kothammavasal is the celebration of the beginning of the Telugu year. It is celebrated in the month of March, The well-to-do of the village distribute money or presents among the poor.

Kaarthagipoornima is another important festival celebrated in the month of November or December. It is a common Oriya festival which reminds one of the olden days, when merchant ships sailed from Orissa to distant countries like Indonesia and Malaysia to barter goods. Those sailors are regarded by the fisherfolk as their ancestors, too.

The women, whose fathers, brothers and husbands went on the long voyage, had to fast and pray for their safe return, hence it is predominantly a women's festival. During the festivals all mud houses are completely renovated and a new roof is constructed or the old one is repaired. The women along with the children collect clay a few days before the festival and prepare the hut themselves except for the roofing. It is considered their duty to white wash their house. The women fast and perform pooja with sweetmeats. They offer these at the altar of large Hindu temples. The children make decorative paper boats and float them in temple ponds. On the day of the festival boat and net owners among the fisherfolk hire new labourers to work for them during the next year or more.

Apart from these festivals, the fisherfolk celebrate particular days in honour of the numerous deities. The celebration for the deities in general is in the form of Jataras. Sacrifices of animals are made to various deities during the Jatara. In the evenings story-tellers, to the accompaniment of music narrate the exploits of the deities.

Apart from these festivals once, twice or thrice a year according to the availability of village funds, a festival is conducted for the village deity. The shrine of the village deity is usually in the middle of the village or at the entrance to the village. During the festival which takes place for three days, the deity is taken out of its abode to the houses of well-to-do fisherfolk who undertake the expenses and celebrate the festival for that day which includes a feast for the whole village. These families are regarded at this time as being related to the deity by fictive kinship.

In the evenings 'Harikathas' are conducted by musical parties who tell mythological stories of gods, Puppet dance, street dramas and fairs are also conducted in the evenings. On the last day of the celebration the deity is taken back to its abode. From the beginning of the celebration to the end, the caste/village panchayat rules that no villager should leave the village or spend the night outside. Breach of this rule is supposed to bring the wrath of the deity.

3.3.3 Rituals associated with Fishing

The Telugu fishermen of South Orissa follow special rituals while going to sea and while launching a new boat.

At the sea shore before going out to sea fishermen pray to Gangamma to give them a good catch and also to bring them safely back to the shore. They also pray to favourite deities and their ancestors. Once in a while, they sacrifice a chicken and offer coconuts and fruits to the sea goddess and perform a pooja at the shore. At the time of full moon day, they pray to **goddess** Gangamma by burning incense sticks and offering bananas **and** coconuts.

Just before launching their boat the fishermen take sea water in the mouth and spit it on the kattumarams and also sprinkle sea water on the head and pray.

At the time of launching a new boat, especially in the case of the boat used for beach seining, an elaborate ritual is performed called the marriage of the boat, with the boat personified as 'Maogala', an auspicious goddess, to the sea. An auspicious day is fixed by the boat owner in consultation with a brahmin. The boat owner husband and wife or, mother and son go to all the net owners they know well and invite them for the marriage. The boat is decorated with coloured papers. Turmeric paste and vermilion are applied to the boat. Inside the boat, baskets full of fruits, flowers, sweets, parched rice, and parched grams are kept. After everybody has assembled a chicken is sacrificed at the helm of the boat so that its blood flows on the boat. This pooja is carried out in front of friends and relatives and sweets and fruits are distributed. Elderly married women referred to as 'Sumangalis' push the boat ritually into the sea, later on it is actually launched by men and children. The first day's catch is partially sold and partially distributed to kith and kin.

Family Structure, Socialization and Cognitive Patterns in Different Economic Strata of Artisanal Marine Fisherfolk

By **M. H. Kalavathy/U. Tietze**

As artisanal marine fishing developed from a trade once oriented towards subsistence to an occupation which has nowadays become part of the coastal market economy with its products even being exported to other continents, economic stratification has become more distinct within traditional fishing communities. This chapter examines whether economic stratification has had an impact on social and socio-psychological institutions and processes such as family structure and interaction patterns, socialization of children and perception of trade and nature. Inferences are analysed separately for the Oriya and Bengali fisherfolk of North Orissa and the Telugu fisherfolk of South Orissa.

First, however, the present stage of economic differentiation in artisanal marine fishing is briefly discussed.

4.1 Present Stage of Development of Artisanal Marine Fishing Economy and Economic Stratification.

The present artisanal marine fishing economy, once oriented towards subsistence, has become part of a developed fishing economy which is to some extent even export-oriented, attracts capital from other sectors of the economy and avails itself of industrial **technologies** such as mechanised trawlers, gillnetters and purse

seiners, insulated trucks, cold storage facilities, freezing plants, ice plants etc. even though the degree of processing is comparatively low.

While there are various links and also conflicts between the artisanal and the industrial fishing economy, the artisanal fishing economy still constitutes a clearly distinguished sector which will be briefly described below according to the following criteria : differentiation of production process in subsectors, distribution of assets and income, sharing system, accumulation of capital and division of labour.

Regarding the division of the traditional fishing economy, the following functions can be distinguished :

- production e.g. catching of fish
- processing of fish
- marketing of fish
- finance, credit
- manufacture of means of production e.g. boat building, net making etc.

In some cases, the functions are interwoven and performed by the same category of persons; in other cases, they are separate and performed by different groups, depending on the stage of development of particular communities.

In fishing, we can distinguish crew members not contributing any equipment (labourers), crew members contributing gear pieces, crew leaders who again contribute gear pieces or who do not, and owners (of craft and gear or part of the gear) who participate as crew members or who stay on shore.

Regarding the distribution of income, a sharing system prevails, which ensures an equal share for all those who participate in the fishing operation plus shares for craft and gear, which are meant for depreciation, repair, maintenance and a certain return on the investment made in craft and gear. Crew leaders get an additional share from the share of the owner or from the share for craft and gear. This pattern is common among artisanal fisherfolk as observed by Mathur (1978) and Norr (1972).

However, the sharing system is a flexible one. If the catch is poor, the share of boat and gear is reduced to ensure a minimum income for the crew. In case of a bumper catch, however, the share of the crew members will be reduced drastically a fact which works as a mechanism rebounding to the accumulation of capital.

Apart from sharing systems, crew members of displacement boats in North Orissa who do not contribute any fishing gear are sometimes remunerated by fixed wages, which are comparatively unfavourable. This system is found in communities with traditional caste occupations other than fishing and seems to originate more from agriculture than from fishing.

Processing of fish in the artisanal fishing economy is done in principle in two ways, one at family level and the other on a large scale by wholesalers. The first way of processing is followed when the retailers have unsold fresh fish which cannot be preserved. The second type is adopted for fish species which are exclusively sold in dried form and which are processed in large quantities. In this case, the labourers who are employed for processing are paid daily wages. This large-scale commercial processing, if done by members of the fisherfolk community, is mostly organised by women¹ of big boat and net owners.

Marketing of fresh fish is done in two ways. If fish are auctioned by the village as a whole or privately, they are bought by the villagers as well as outside traders. The wives of big net owners buy fish wholesale and distribute them in small quantities to others by retail, keeping a small quantity for their own retail sale.

Others buy small or large amounts of fish directly and retail them and also barter fish for vegetables, paddy and pulses. If the village auction does not take place, net owners' wives take their produce to the market for retail sale or sell it to the traders on the shore itself. If they employ labourers to lift baskets or carry baskets to markets, they pay them daily wages.

¹ The role of fisherwomen in processing an small and large scaie Marketing is discussed in the report 'Role of Women in Small-Scale Fisheries of the Bay of Bengal 1980.



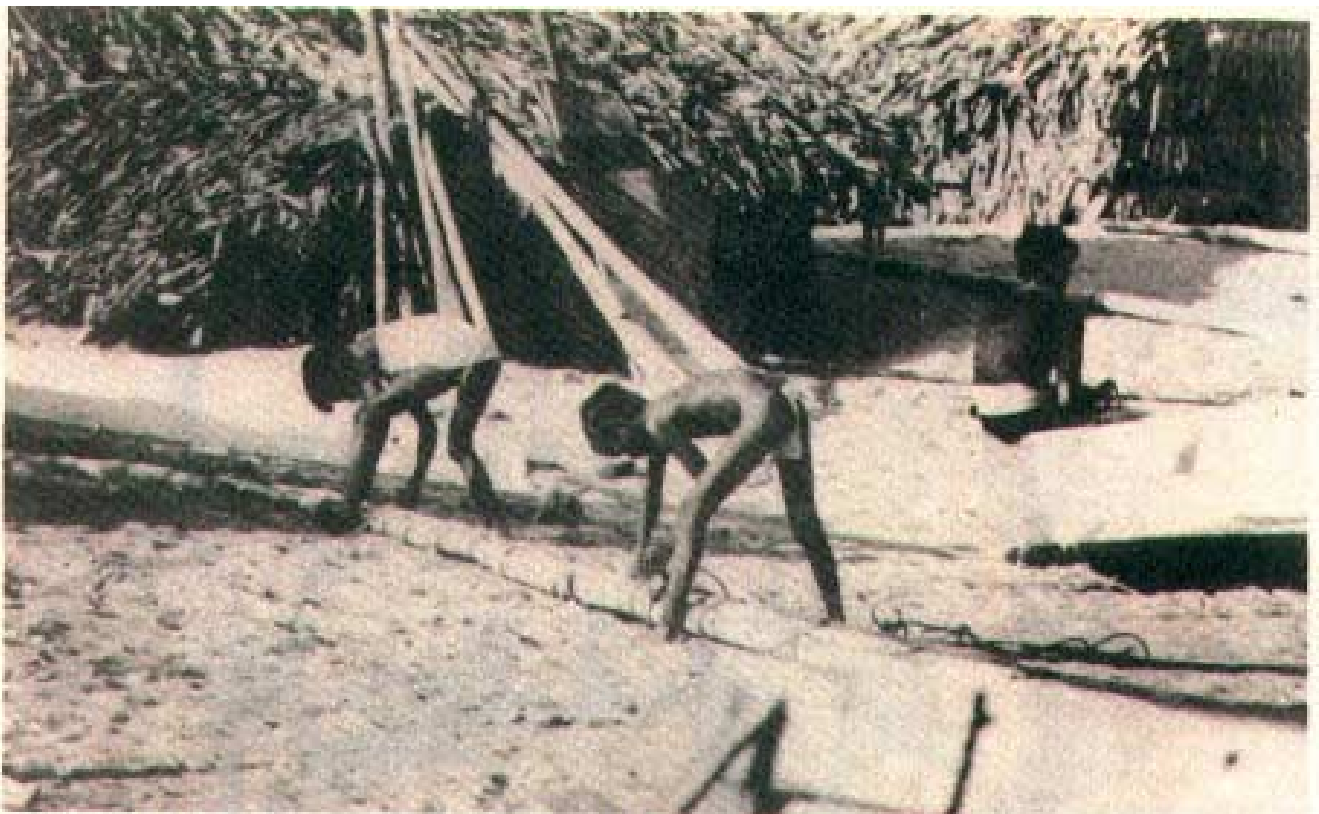
Drying and sorting out of fish in Chandipur,
Batasore district



Women head load retailers at Puri beach



Agent collecting prawns on the beach in Puri



Children of Puri preparing fishing equipment

Fish traders also advance loans to the fisherfolk and as a result the fisherfolk are bound to sell the produce at pre-fixed rates to the traders. This is the case particularly with export products such as prawns, shark fins etc. Apart from fish merchants, finance and credit within the artisanal fishing economy are provided by friends and relatives and by professional moneylenders from outside the community (Norr 1972, p. 210, Firth 1966, p. 168). Furthermore there are moneylenders within the community who are at the same time, or have been earlier, big net owners or fish merchants.

Even though the word moneylender still has a negative ring, among the artisanal fisherfolk there is a group of persons who, having accumulated capital by fishing and fish marketing/processing, act as financiers later on.¹

While fishing gear is manufactured and repaired by the fisher-folk themselves, boats are constructed by carpenters. Equipment and accessories such as yarn, floats, hooks etc. are sold in small shops which are rarely run by members of the fisherfolk community.

The differentiation of the artisanal fishing economy into sub-sectors such as fishing, processing, marketing, boat building, trade in equipment and financing is accompanied by a process of capital accumulation which has its major sources in the fishing operation itself.

In places where the economic differentiation is more advanced the functions are separate and performed by different groups of artisanal fisherfolk. How far this process is caused or facilitated by factors outside the artisanal fishing economy cannot be analysed here.

The processes of economic differentiation and accumulation of capital led to an economic stratification which is also reflected

1. This point is highlighted in the study of Christensen (1977, p. 85), who, while referring to the financing and the economic role of marketing women, shows that marketing women are often independent fishing craft and gear owners. who invest their profits from fishing and marketing by giving credit to others in the fishing community.

by the distribution of assets (craft and gear). The following table gives the figures for the two southern coastal districts of Orissa, Puri and Ganjam with a total number of marine fisherfolk **house-**holds of 5898 of which the majority belong to the Telugu castes Vodabalijas and Jalaris.

Table 1 : Distribution of Assets in Gaojam and Puri District of Orissa¹

District	Ganjam	Puri
Distribution of assets		
a. Ownership pattern with regard to boats		
Percentage of households with no boat	37%	57%
Percentage of households with one boat/ boat share	36%	25%
Percentage of households with two and more boats/boat shares	24%	17%
Total	97%	99%
b. Ownership pattern with regard to gear		
Percentage of households with no gear	37%	50%
Percentage of households with one gear/ gear share	16%	11%
Percentage of households with two gear/ gear shares	10%	13%
Percentage of households with three and more gears/gear shares	35%	25%
Total	98%	99%

In both districts the percentage of those who do not own any boat roughly equals the percentage of those who do not own any net. This pattern suggests that on the one hand there is a group of labourers who do not own any assets while on the other

1. See M. H. Kalavathy and U. Tietze 1984, p. 25

band boats as well as nets are owned by the same households. This is also observed by Norr in her study of Tamil Nadu fisherfolk (Norr 1972, p. 45).

While the households which do not own any net form the biggest group, the second biggest group is formed by those who own three or more gears. In the case of boat ownership, the biggest group consists of non-owners followed by those who own one boat. The group of households who own two and more boats is still around 1/5 of the total number of households.

Table 2 : Distribution of Assets in Cuttack and Balasore Districts of Orissa¹

District	Cuttack	Balasore
Distribution of assets		
a. Ownership pattern with regard to boats		
Percentage of households with no boat	49%	81%
Percentage of households with one boat/boat share	36%	17%
Percentage of households with two and more boats/boat shares	15%	1%
Total	100%	99%
b. Ownership pattern with regard to gear		
Percentage of households with no gear	35%	18%
Percentage of households with one gear/gear share	43%	60%
Percentage of households with two gears/gear shares	4%	17%
Percentage of households with three and more gears/gear shares	18%	3%
Total	100%	98%

1. See M. H. Kalavathy and U. Tietze 1984, p. 25

The table shows a concentration of ownership which might be related to operational and managerial skills available with the respective households.

The two northern districts of Orissa, Cuttack and Balasore show a different picture.

Balasore district, inhabited by Oriya and Bengali fisherfolk who operate displacement boats, is characterized by the fact that, even though 82% of the fisherfolk households own at least one gear or gear share, only 17% own a boat or a share in a boat and a mere 1% have two or more boats or boat shares. While the table suggests widespread ownership of the existing boats and no concentration, each household usually owning not more than one boat, the total number of boats which can be arrived at from this distribution as compared to the total number of households seems to be inadequate.

The reason as observed during the study is that, in the Oriya and Bengali coastal villages of North Orissa, fishing boats are often owned by members of other communities such as well-to-do agriculturists and leased out to fishermen.

The ownership pattern with regard to nets shows a widespread ownership of small assets such as 1 net piece/share. The reason for this phenomenon is that in Balasore a crew member has to contribute a net piece in order to get a share of the catch, If he cannot provide a net piece he gets a fixed wage per fishing day and this is unfavourable compared to a share. The number of owners declines rapidly when it comes to ownership of more than one net.

All in all, the concentration of assets, seems to be less among the Oriya and the Bengali fisherfolk than among the Telugu fisherfolk.

The reason might be that marine fishing has a much longer tradition in the south than in the north, and that is why the economic stratification is more advanced there. Cuttack district is settled by Telugu as well as by Oriya and Bengali fisherfolk and thus shows a mixed picture combining the characteristics of both North and South Orissa,

Differences with regard to performance of economic functions, division of labour and ownership of assets, as outlined above, find their equivalents in social status, role in political leadership of a community, role in cultural functions, marriage patterns, settlement patterns and standard of living. For example, labourers not owning any assets live in different streets and in smaller houses than owners of craft and gear.

Marriages are usually arranged within the labourers group, small owners' group or big owners' group respectively and not between the groups'. Functions performed and rituals are usually connected with economic status. The functions again reflect the social status of the person or family who performs the function.

Changes of economic status regularly lead to conflicts with roles played in rituals and festivals.

An important area, however, where differences in economic status are not readily shown in social status differences is the working pattern during the fishing operation itself, which is most probably due to the fact that owners usually participate in fishing and that there is hardly any specialisation aboard a small fishing craft where all crew members rely on one another for a good catch and a safe return to the shore.² Thus a tendency towards narrowing of economically based social status differences exists and is caused by the demands of the production process itself.

On the basis of these considerations and assumptions, the following chapters examine the Telugu fisherfolk of South Orissa and the Oriya/Bengali fisherfolk of North Orissa separately to ascertain whether the existence of different economic strata is reflected by differences in socio-psychological processes and institutions e.g. socialisation of children, perception of occupation

1. This adherence to economic status in spite of the homogeneity of caste is also noted in a fisherfolk community studied by Norr (1972). p 47). She mentions that even though caste members of different economic status associate freely, their preference group is limited to their own economic status for marriages.
2. This phenomenon is discussed as egalitarian work group structure by Pollnac (1978, p. 6).

and nature, and the structure of primary social groups like the family.

4.2 Family, Socialization Process and Cognitive patterns in Different Economic Strata of Artisanal Marine Fisherfolk of South Orissa

The economic stratification, which is applied here, is based on the production process (fishing) in South Orissa and comprises three strata, viz. labourers not owning any craft and gear, small owners owning one craft and one or more gear, and big owners owning several craft and gear.

The three economic strata are compared and examined to find out whether type and structure of family as an important primary social group, socialisation process and cognitive patterns reflect differences in economic status and function.

The analysis is based on a sub-sample, consisting of 86 Telugu fisherfolk households, selected from four villages of Ganjam district; 28 households belong to the 'labourer' category, 30 households to the 'small owner' category and 28 households to the 'big owner' category.

4.2.1. Economic Stratification and Family

Family as the most important primary social group performs a wide range of socio-psychological, social and economic functions and tasks, regarding both its members as well as community and society. In accordance with Leslie (1982), the main functions and purposes of family can be summarized as satisfaction of sexual needs and biological reproduction, common residence, socialization of children and in some cases economic cooperation.

With regard to the function common residence, we can further distinguish between family as a domestic group and family as a residential group (Harris 1970, p. 75 and 78). While domestic group means that family members share domestic services such as provision of food, shelter, clothing etc. not necessarily living in the same house (or hutment in the case of most fisherfolk families), residential group denotes, that even though family members live

in the same house, they form separate domestic groups or separate households.

The family function, economic cooperation can be subdivided into two components. A domestic group can be an economic group “in the sense that they purchase and consume goods as a unit” (Harris 1970, p. 79). In this case a family forms an economic unit with the emphasis on common purchase and consumption of goods. Apart from this, family can also assume the role of a productive economic unit : “where a group’s members act together to exploit productive resources owned by all or one of them, then the group may be regarded as an economic group in the productive sense” (Harris 1970, p. 79). Harris (ibid) points out further that in some societies and this applies to a large extent also to the fisherfolk communities described here, economic production is usually undertaken by groups of kinsmen and property and employment are primarily obtainable through membership in a kingroup. These kingroups can be further distinguished according to whether they own property without working it in which case they are called proprietary group, or whether they function as a work group without owning any property.

In order to carry out the functions and tasks mentioned above, family constitutes a specific social group with roles and interaction patterns, which follow on the one hand the dominant norms of society and on the other hand reflect the unique experiences, beliefs and values shared only by the members of a particular family. Under the latter aspect, family may be called a “unique set of roles and values” (Harris 1970, p. 70). In this context family has also to be seen as a permanent interaction process with family members exchanging expectations and informations, interpreting, negotiating and defining norms and rules, communicating emotions, sharing tasks etc. While acting in specific roles which are among other things defined by age and sex.

The focal point of family organization with regard to performance of tasks and functions is the pattern of division of labour among the family members, while the focal point from the viewpoint of family as interaction process is the authority structure or decision making pattern of the family.

Family does not only consist of functions, roles, values, and interaction patterns, but being a social institution followed certain customs and rules regarding its foundation and break up, marriage, inheritance, etc. regulating the family process which means “the creation and extinction of nuclear (and extended, the author) families, the creation of new members by birth, the loss of existing members by death; the establishment of affinal relationship by marriage; the supplementation of these ties by ties of filiation as the children are born, and affines become kin’s kin.” (Harris 1970, p. 70)

The type of family traditionally found in India is the joint family. Even though now-a-days joint family in its original form is not any longer existing, the concept of joint family still has its implications for contemporary family life. The term joint family, does not only denote the composition of a family as it is the case with the terms nuclear family and extended family, but also indicates a certain authority pattern, a certain mode of inheritance, a certain ownership pattern and utilization of family property as well as a certain pattern of worship/religious practises. O’ Malley (1975, p. 121) defines joint family in the following way : “In its complete form a joint family has a common property, a common house, with a common kitchen and common worship of a family idol or idols.” A similar definition is given by Karve (1953, p. 10).

Common residence however, is not a necessary property of a joint family even though rural joint families usually reside together. O’ Malley adds (ibid) “It must not be concluded that all members of the family reside together. But there is a home, in which the worship of the family idol is kept up, in which every member of the family has a right to live, and in which there is a more or less complete family gathering on the occasion of certain festivals.”

Thus a joint family might consist of several separate households, which again might be extended ones or nuclear ones.¹ The

1. Agarwala (1955, pp. 141-142) holds the similar view that members of a joint family need not necessarily reside together or form a household, referring, hoever, to an urban commercial community. See also Desai (1950, pp. 147-148), who holds the same opinion.

empirical case, however, that members of joint families live in separate households occurs more often in urban settings caused by the “conditions of modern life” (O’Malley, *ibid*), such as lack of cheap large flats and houses, separate places of work etc. but hardly in traditional rural settings as prevailing in coastal fishing villages.

Thus for the purpose of this study, being an empirical one, family is operationalized as household, meaning a domestic and residential group, thereby facilitating proper identification of sample units and respondents.

With regard to family, 4 aspects are analysed : family type and size, formation and break-up, division of labour and decision-making pattern.

4.2.1.1. Family Type and Size of Family

Among the properties of families discussed above, the following will be examined for the families of artisanal marine fisherfolk of Orissa in this chapter :

- type, composition and size of family
- formation and break-up
- division of labour
- authority/decision making pattern

Among the Telugu fisherfolk of South Orissa, a family whether it is an extended or a nuclear one is referred to as “Kudumbam”. Telugu fisherfolk families both of Vodabalijas and Jalaris are characterized by pntrilocal and patrilineal descent and patriarchal authority. Primogeniture or the principle of the outstanding role of the first child is reflected in property inheritance and certain functions within the family. Most of the families are monogamous, While Indian families are classified into different types based on various authors, here Kolenda’s classification is followed (Kolenda 1962). Nine different types of families **have** been distinguished among the Telugu fisherfolk of South Orissa.

-Incomplete families without dependents (1) and with dependents (2) : An incomplete family consists of a wife and a husband without children or of one of the parents with children. Dependents living in incomplete families were grandparents and grandchildren.

The number of incomplete families living in fishing villages in South Orissa is very small, usually consisting of a married couple without children, sometimes living together with a widowed parent or a grandchild.

-Nuclear families without dependents (3) and with dependents (4) : The nuclear type of family is the most common family type found among the Telugu fisherfolk of South Orissa, Its dominance might be due to the common habit of setting up a separate house and household soon after marriage. While, a nuclear family without dependents consists of parents and children, a nuclear family with dependents has a widowed parent as an additional family member.

-Lineally extended families with dependents (5) and without dependents (6) : Lineally extended families, consisting of parents with married children and grandchildren constitute the type of family that is found most frequently after nuclear families. Close relatives form the group of dependents who are staying with lineally extended families.

-Collaterally extended family (7) : When one or more siblings, in this case brothers continue to live together after marriage, it is understood as a collateral family. This type of family is, however, negligible among the Telugu fisherfolk of South Orissa according to our findings.

-Lineally and collaterally extended family with (8) and without dependents (9) : This family type combines both the characteristics of a lineally and of a collaterally extended family.

The tables below show the occurrence of different family types in the three economic strata as well as the family size.

Table 3 : Family Type vs. Economic Stratum¹

Type of family	Economic strata	Labourers group	Small owners group	Big owners group
Incomplete family		3	—	
Incomplete family with dependents		1	—	2
Total no. of incomplete families		4 (14%)	0	2(7%)
Nuclear family		16	14	8
Nuclear family with dependents		6	6	6
Total no. of nuclear families		22 (79 %)	20(67%)	14 (50%)
Lineally extended family		2	9	4
Lineally extended family with dependents		—	—	2
Lineally/collaterally extended families		—	1	3
Lineally collaterally extended families with dependents		—	—	2
Collaterally extended families		—	—	1
Total no. of extended families		2% (7%)	10 (33)	12 (43%)
No. of respondents		28 (100%)	30(100%)	28(100%)

Table 3 a : Average Family Size

Labourers	4.8
Small owners	5.7
Big owners	7.7

1. The family types have been distinguished based on Kolenda’s classification of family types (Kolenda 1962).

The table indicates a clear pattern. With the ownership of assets the number of extended families and the family size increases and the number of nuclear families decreases. The reason for this phenomenon is that in the higher economic strata e.g. in small owner and big owner households, the family assumes the function of a production unit, which is not the case in labourer households.

In families functioning as production units family members apart from working as crew members carry out functions such as participation in fishing operation, team recruitment, fish sales, arranging for repair of equipment, procurement of spare parts etc. so that a larger number of assets also requires or accommodates a larger family. Simultaneously a larger number of assets can also sustain a larger family.

4.2.1.2 Formation and Breakup of Families

The formation and breakup of families and their relation to the economic stratum have been examined by investigating the mode of inheritance and the instances of separation of the younger generation from the family. The general hypothesis was that the different functions that families belonging to different economic strata perform in the production process might be reflected by different modes of inheritance and by different instances of separation prevailing in the different economic strata.

This assumption, however, could not be confirmed. In both cases a common pattern in all economic strata was observed.

As mentioned earlier, marriages are preferably arranged within the same economic stratum. In all strata childhood marriages are common. The average marital age of girls and boys was found to be 9 years and 17 years respectively. In spite of a regular marriage taking place a girl goes to settle down in her husband's home only on attaining puberty when after a special ceremony her husband's family take her ritually home.

Apart from economic considerations mentioned above, caste endogamy is strictly practised, when selecting bride and bridegroom. Both inter as well as intra-village marriages take place depending

on the availability of brides and grooms. All families prefer kin marriages. Preferential bilateral marriages between cross cousins ("Menachium") are a dominant feature. Uncle-niece marriages are also Common.

Among the Telugu fisherfolk of South Orissa, the traditional custom of bride price is slowly being replaced by a dowry system, a process which is more advanced in higher economic strata. At the time of marriage the girl's family usually presents dresses, both to the bride and bridegroom. In higher economic strata the bride receives jewels and the bridegroom a wrist watch, a bicycle and a ring. When shifting to the house of the in-law, the bride is given household utensils, a box to keep her clothes, a mat and a pair of pillows. The family of the bridegroom celebrates the marriage in their village and takes care of the expenses. Before the actual marriage, at the time of engagement, the bridegroom's family is expected to give jewels or gold to the bride as "Prathaanam." If they are not in a position to do so, the bridegroom's family has to borrow gold and present it to the bride symbolically. This custom clearly perpetuates the tradition of bride-price and show the special status of women in the coastal Telugu fisherfolk communities of South Orissa.

Regarding separation from family, the usual practice is that at the time of marriage the son requests separation from his parents' household. If he is not urged by his parents to set up a separate household the son might also stay on with his parents' family. In the first case the parents provide space and essential construction materials and household goods. In the latter event, the following are the consequences in all three economic strata. Firstly, the newly married wife has to be integrated in the working pattern, status hierarchy and communication pattern of the female sub-group of the family. Secondly, with the emergence of a new sub-group e.g. wife and husband, the question of contribution to family income and consumption arises regardless of the question whether assets are owned by the family or not.

Accordingly, reasons for separation from the family after marriage cited by respondents from all strata are quarrels and conflicts between mother and daughter-in-law and between daughter-

in-law and unmarried sisters mainly because of status conflicts and distribution of work. Equally important are quarrels among brothers over contribution to family income and expenditure for consumption¹

Similar reasons are given by O' Malley (1975, p. 125) who discusses the dissolution of joint families in India in general: "Family disputes are the most usual cause of the dissolution of families in separate branches. In particular, earning members who contribute to the family resources are disgusted by a system under which idle relatives are a drain upon them, and their wives, devoted to their husbands' interests, keenly resent their energies being exploited."

It needs to be mentioned here, that the dissolution of extended families does not necessarily mean the end of the extended or joint family system. According to the respondents, it seems that now-a-days an extended family breaks up much more easily than earlier. For example married brothers after the death of their father take their separate shares and start separate families and households of their own, aiming, however at new joint families with their sons, as also observed by O' Malley (1975, p. 126). In accordance with O' Malley (*ibid*) it can be assumed that "the general effect is, that large joint families are replaced by small **joint** families many in number and short of duration."

The mode of inheritance is similar in all theeconomic strata because it is based on the custom that assets as well as debts are equally shared by old parents and sons, Older sons might get a higher share of property if they have to take care of unmarried brothers and sisters and also a higher share of debt.

Girls do not get any share other than the jewels and household utensils given to them at the time of marriage as part of the dowry.

1. According to Suryanarayaam's study of coastal Andhra fisherfolk (1977, p. 76) status conflicts and economic conflicts lead to a partial separation of extended families where the means of production are not divided and the fishing is still carried out together and the produce divided equally but the individual nuclear families cook separately.

4.2.1.3 Division of Labour in the Family

To obtain a true picture of the working pattern of families in all three economic strata, women and men were interviewed separately in order to consider differences in perception. The activities chosen for investigation can be broadly classified into household work activities and activities related to fishing, Tables 4, 5, 6 show the results for the three economic strata.

Regarding the perceptions of the female respondents, there are no major differences among the economic strata over the distribution of work between men and women.

With regard to activities related to fishing, men dominate all activities such as fishing, team formation, procurement of inputs, fish marketing and processing with the important exception, however, of management of fishery finance, which is predominantly taken care of by women. Household work including management of family finance is looked after, with little assistance from male members of the family, by women in general. The only indication of differences related to economic stratum is given by the female respondents in the labourers' group who state more often than the two owners' groups that male members assist them in household work. Even though bisexual division of labour in household activities is common among the lower class families, where roles are less distinct in reality, the men in the labourers' group do not share the view of their wives regarding their involvement in **household** work. As in the other strata, they state their own involvement as a marginal one most likely because they still stick to a traditional role pattern of men not involving themselves in household work as heads of families even though in reality the actual practice has changed. When comparing the number of female members involved in household activities, the number of female members of labourer families involved in household work is higher than the respective numbers in owner families, even though the family size is smaller. This tendency may be due to the greater flexibility in division of labour among female members in labourers' families than among those of owners' families. This projects a picture of more female members in labourers' families even though they are fewer than those in owners' families.

Table 4 Division of Labour in Household-Labours Group

Activity	Women's perception/activity done			Men's perception/activity done		
	exclusively by women	exclusively by men	by both	exclusively by women	exclusively by men	by both
Cooking	43	—	—	33	—	—
Firewood collection	47	—	—	30	—	—
Shopping	44	4	5	24	—	5
Washing	30	5	—	15	—	—
Cleaning	45	1	—	28	—	—
Childcare	37	3	4	22	—	6
House repair	9	2	5	5	4	2
Gardening	7	—	1	—	—	2
Tailoring	4	1	4	—	—	1
Carrying water	50	1	—	24	—	2
Management of family finance	27	1	9	17	3	8
Animal keeping	8	2	1	3	—	—
Fish marketing/processing	5	20	3	14	—	—
Fishing	—	33	—	—	28	—
Procurement of inputs for fishing	—	21	—	—	8	—
Management of fishery finance	16	10	5	6	13	1
Formation of teams for fishing	—	—	—	—	—	—

Tables 4 and 5 show the number of household members involved in the respective activities. Therefore, the number is in most cases greater than the number of households. In some cases no answer was obtained, so that the number is smaller than the number of households.

Table 5 : Division of Labour in Household—Small Owner Group

Activity	Women's perception/activity done			Men's perception/activity done		
	exclusively by women	exclusively by men	by both	exclusively by women	exclusively by men	by both
Cooking	36			37		
Firewood collection	35	—	—	32	1	—
Shopping	34	—	4	29	1	2
Washing	19			26		
Cleaning	36	—	—	36	—	
Childcare	38		2	31		2
House repair	8	2	3	13	4	—
Gardening	1	—	—	3		
Tailoring	1	—	1	3	—	
Carrying water	42	—	—	36		
Management of family finance	28		5	13	14	3
Animal keeping	2	—	—	10	—	—
Fish marketing/processing	3	21	9	16		1
Fishing	—	38		—	26	—
Procurement of inputs for fishing	—	34	—	1	22	—
Management of fishery finance	13	5	8	—	16	2
Formation of teams for fishing	—	28	1	1	16	1

Table 6 Division of Labour in Household—Big Owner Group

Activity	Women's perception/activity done			Men's perception/activity done		
	exclusively by women	exclusively by men	by both	exclusively by women	exclusively by men	by both
Cooking	32	—	—	38	—	—
Firewood collection	43	—	2	43	—	—
Shopping	32	2	2	34	1	1
Washing	32	—	—	23	—	—
Cleaning	37	—	—	40	—	—
Childcare	33	3	2	32	—	—
House repair	14	—	2	9	1	6
Gardening	10	—	—	7	—	—
Tailoring	5	—	2	10	—	—
Carrying water	35	—	—	35	1	—
Management of family finance	22	2	3	14	7	2
Animal keeping	6	1	2	8	—	1
Fish marketing/processing	3	27	—	7	—	1
Fishing	—	43	—	—	—	—
Procurement of inputs for fishing	1	37	—	2	19	—
Management of fishery finance	16	10	3	10	9	3
Formation of teams for fishing	2	35	1	3	15	1

Considering that the number of extended or joint families is larger in the owner strata than in the labourer stratum, this finding agrees with the statement of Ross (1973, p. 87) made with regard to the division of labour in urban Indian families : "One of the main differences between the division of labour of the large joint family compared to the nuclear family lies in its distinct duties".

Overall the perceptions of the male respondents differ to a significant extent from the perceptions of their wives.

In the case of fishery finance, only male respondents belonging to the big owner stratum share the view expressed by the female respondents of all groups that women predominantly manage financial affairs related to fisheries. Contrary to their wives' views, male respondents from the small owner group claim to dominate this activity while male respondents from the labourer group hardly see any role for women in the management of fishery finance.

In the case of family finance, male respondents belonging to the labourers' and big owners' groups to a great extent, share the **view** of the female respondents that women predominantly manage the financial affairs of the family.

Male respondents belonging to the small owner category, however, claim to manage the financial affairs of the family jointly with their wives.

Whether these differences in the perceptions of the female and the male respondents of the three economic strata reflect different living conditions or just different value systems cannot be decided here but has to be further investigated through observation.

Another difference that appears in the perceptions of the female and the male respondents of all three strata concerns fish processing and marketing. While men uniformly assign these activities to the female members of the family, the female respondents hold the opposite view¹.

1. The same tendency has been observed by Christensen among the Fanti-an African fishing community. In spite of the important role played by **Fanti** women in marketing and thereby the economy, they do not like to acknowledge it. (Christensen, 1977, p. 86).

Table 7 : Distribution of work among Women (Female Respondents)

Family Member	Labourers			Smah Owners			Big		
	Mother Mother- in-law Grand mother	Unmar- ried daugh- ten	Daughter- in-law	Mother in-law Grand mother	Unmar- ried daughter	Daugh- ter-in- law	Mother Mother- in-law Grand- mother	Unmar- ried daugh- ter	Daugh- ter-in- law
Cooking	79	19	2	56	11	33	63	6	31
Firewood collection	72	23	4	49	20	31	51		28
Shopping	70	25	5	65	18	18	56	16	28
Washing	73	17	10	63	16	21	53	19	28
Cleaning	73	18	9	56	25	19	57		27
Childcare	62	30	8	61	26	13	56	28	16
House repair	78	22	—	63	13	25	79		21
Gardening	42	29	29	100	—	—	20	40	40
Tailoring	50	50	—	100	—	—	60	—	
Carrying water	64	28	8	48	36	17	51	20	29

Management of family finance	100	—	—	100	—	—	82	9	9
Animal keeping	75	25	—	100	—	—	83	17	—
Fish marketing	80	—	20	100	—	—	67	—	33
Fishing	—	—	—	—	—	—	—	—	—
Procurement of inputs	—	—	—	—	—	—	100	—	—
Formation of teams	—	—	—	—	—	—	100	—	—
Management of fishery finance	100	—	—	92	—	8	100	—	—

Note All figures are given in %. Only those cases are included where the activities are carried out exclusively by women. The percentages refer to the absolute figures given in tables 4, 5 and 6.

Management of family finance	33	67	—	76	24	—	100	—	
Animal keeping	—	—	—	—	—	—	—		
Fish marketing	—	—	—	—	—	—			
Fishing	100	—	—	81	19	—	44	50	6
Procurement of inputs	100	—	—	86	14	—	53	47	—
Formation of teams	—	—	—	88		—	53	47	
Management of fishery finance	100	—	—	94	6	—	89	11	

Note : All figures are given in %. Only those cases are included where the activities are carried out exclusively by men. The percentages refer to the absolute figures given in tables 4, 5, 6.

While it is assumed from observation that the view of the male respondents is correct, the reason for the women's perception is most probably the fact that even though they are involved in processing and marketing of fish, they do not consider it an integral part of their role and attach a low value to it.

In accordance with this, the men's view also shows that the number of women who are involved in fish marketing/processing decreases with lowering of the economic status. It should be kept in mind, however, that this is not the case in the perception of the female respondents.

In tables 7 and 8 we see how the work is distributed among different members of the women group and the men group.

Tables 7 & 8 show differences among the economic strata which are based on the different types of families to be found in the strata: the higher the economic stratum, the bigger the family and the greater the contribution of married sons, unmarried daughters and daughters-in-law.

Regarding fishing, the father is the only active fisherman in all the labourer families interviewed. In the small owners' group he is occasionally assisted in fishing by married sons, the latter however being hardly concerned with the management of fishery finance. In the big owners' group the father and a married son share all the activities, related to fishing except the management of fishery finance; unmarried sons play only a minor role in fishing. The reason might be that even though unmarried sons participate in fishing, they are neither regarded nor mentioned as active fishermen because only after a certain age at which they get married, are they given a full share and accepted as full-fledged crew members.

In labourers' households the mother has a larger portion of the household work than in the small owner household, where she is more often assisted by unmarried daughters and in some cases also by daughters-in-law. In big owner families her portion is even less with regard to the most time-consuming activities. The

Table 9 : Verbalization of Family Matters

Activity	Men's perception									Women's perception								
	Labourers			Small owners			Big owners			Labourers			Small owners			Big owners		
	Dis- cussed	Not dis- cussed	No answer	Dis- cussed	Not dis- cussed	No answer	Dis- cussed	Not dis- cussed	No answer	Dis- cussed	Not dis- cussed	No answer	Dis- cussed	Not dis- cussed	No answer	Dis- cussed	Not dis- cussed	No answer
House construction/ repair	17 (61)	11 (39)	—	17 (57)	13 (43)	—	20 (71)	8 (29)	—	27 (96)	—	1 (4)	26 (87)	3 (10)	1 (3)	20 (71)	1 (4)	9 (25)
Acquisition of household goods	17 (61)	11 (39)	—	18 (60)	12 (40)	—	18 (64)	6 (21)	4 (14)	21 (75)	—	7 (25)	20 (67)	7 (23)	3 (10)	11 (39)	—	19 (61)
Sending children to school	10 (35)	11 (39)	7 (25)	12 (40)	17 (59)	1 (1)	14 (50)	11 (39)	3 (11)	3 (11)	—	25 (89)	6 (20)	13 (43)	11 (37)	10 (36)	4 (14)	14 (50)
Medical treatment	22 (79)	6 (21)	—	26 (87)	4 (13)	—	16 (57)	12 (43)	—	25 (89)	—	3 (11)	29 (97)	1 (3)	—	20 (71)	1 (4)	7 (25)
Celebration of festivals	25 (89)	3 (11)	—	30 (100)	—	—	21 (75)	7 (25)	—	27 (96)	—	1 (4)	28 (93)	2 (7)	—	24 (85)	1 (4)	3 (11)
Purchase of craft and gear	—	—	—	17 (57)	13 (43)	—	20 (71)	8 (29)	—	—	—	—	28 (93)	2 (7)	—	23 (82)	3 (11)	2 (7)
Selection of spouse	17 (61)	11 (39)	—	16 (53)	14 (47)	—	17 (61)	10 (36)	1 (4)	26 (93)	—	2 (7)	27 (90)	3 (10)	—	20 (71)	1 (4)	7 (25)
Savings	16 (57)	12 (43)	—	12 (40)	18 (60)	—	16 (57)	11 (39)	1 (4)	7 (25)	—	21 (75)	13 (43)	7 (23)	10 (33)	12 (43)	4 (14)	12 (43)
Acquisition of jewellery	17 (61)	11 (39)	—	18 (60)	12 (40)	—	18 (54)	6 (21)	4 (14)	2 (7)	—	26 (93)	12 (40)	14 (47)	4 (13)	13 (46)	1 (4)	14 (50)

In brackets % figures are given

daughter-in-law plays a slightly more important role than unmarried daughters.

Even though the work load is also heavier in the bigger families of the owner strata, the mother does not delegate her role in the management of family finance to the other female members of the family.

4.2.1.4 Decision-making Pattern

The decision-making pattern is analysed under three aspects : verbalization of family matters, participation in discussion of family matters and participation in decision-making. Again, women's and men's perceptions have been obtained separately.

4.2.1.4.1 Verbalization of Family Matters

Table 9 shows to what extent family affairs are verbalized.

When we look at the various items considered for verbalization there are differences among the three economic strata in the perceptions of the female respondents regarding the utilization of savings, acquisition of jewellery and schooling of children, which are more often discussed in the higher strata, most probably because they play a more important role there, on account of favourable economic conditions and plans related to the future of children.

This difference, however, is not reflected in the perception of the male respondents, which might be due to the fact that their views reflect the general norms and values more than the particular reality of their family life.

Concerning the other activities, the female respondents' perceptions reveal that the degree of verbalization tends to decrease with lowering of the economic status. As concluded earlier, the roles as well as the working patterns in the lower economic strata are less rigidly defined than in the higher strata. This necessitates a higher degree of verbalization in order to achieve a level of understanding which is sufficient to carry out the day-to-day household activities.

Table 10: Participation in Discussion of Family Matters (Men's perception)

Activity	Labourers					Small owners					Big owners				
	m	dil	ud	f	s	m	dil	ud	f	s	m	dii	ud	f	s
Houseconstruction	17 (46)	1 (3)	1 (3)	17 (46)	1 (3)	16 (42)	3 (8)	—	15 (39)	4 (10)	23 (35)	9 (14)	—	22 (34)	11 (17)
Acquisition of house hold goods/jewellery	18 (46)	1 (3)	1 (3)	18 (46)	1 (3)	16 (39)	4 (10)	—	17 (41)	4 (10)	21 (39)	4 (13)	—	21 (39)	5 (9)
Sending children to school	12 (44)	1 (4)	1 (4)	12 (44)	1 (4)	14 (40)	3 (9)	—	14 (40)	4 (11)	17 (37)	6 (13)	—	17 (37)	6 (13)
Medical treatment	24 (48)	1 (2)	1 (2)	24 (48)	—	21 (40)	3 (6)	—	24 (46)	4 (8)	24 (39)	6 (10)	—	21 (34)	10 (16)
Celebration of festival	25 (48)	1 (2)	1 (2)	25 (48)	—	24 (42)	4 (7)	—	24 (42)	5 (9)	23 (38)	8 (13)	—	21 (35)	8 (13)
Purchase of craft and gear	—	—	—	—	—	16 (39)	4 (10)	1 (2)	17 (41)	3 (7)	23 (38)	5 (8)	—	22 (36)	11 (18)
Selection of spouse	18 (45)	1 (3)	2 (5)	17 (43)	2 (5)	14 (40)	3 (9)	—	15 (43)	3 (9)	21 (34)	6 (10)	4 (7)	19 (31)	11 (18)
Savings	18 (49)	1 (3)	1 (3)	17 (46)	—	13 (41)	3 (9)	—	13 (41)	3 (9)	19 (39)	6 (12)	—	18 (37)	6 (12)

In brackets the figures are given in %

m—mother, dil—daughter-in-law, ud—unmarried daughter, f—father, s—son

Table 11 : Participation in Discussion of Family Matters (Women's Perception)

Activity	Labourers					Small owners					Big owners				
	m	dil	ud	f	s	m	dil	ud	f	s	m	dil	ud	f	s
House construction	24 (42)	4 (7)	—	25 (44)	4 (7)	31 (40)	8 (10)	—	27 (35)	12 (15)	19 (41)	2 (4)	—	18 (39)	7 (15)
Acquisition of household goods	25 (45)	4 (7)	—	23 (41)	4 (7)	11 (39)	4 (14)	—	9 (32)	4 (14)	17 (37)	3 (7)	—	19 (41)	7 (15)
Sending children to school	4 (50)	1 (12)	—	3 (38)	—	12 (48)	1 (4)	—	7 (28)	5 (20)	12 (40)	2 (7)	—	12 (40)	4 (13)
Medical treatment	27 (49)	—	—	24 (44)	4 (7)	28 (42)	5 (7)	—	26 (39)	8 (12)	20 (35)	3 (5)	—	30 (53)	4 (7)
Celebration of festival	29 (50)	—	—	25 (43)	4 (7)	30 (42)	7 (10)	—	27 (38)	7 (10)	18 (40)	3 (7)	—	19 (42)	5 (11)
Purchase of craft and gear	—	—	—	—	—	24 (36)	8 (12)	—	26 (39)	9 (13)	16 (36)	2 (4)	—	18 (40)	9 (20)
Selection of spouse	27 (47)	3 (5)	—	29 (41)	4 (7)	28 (38)	10 (14)	1 (1)	28 (38)	6 (8)	18 (37)	3 (6)	—	19 (39)	9 (18)
Savings	5 (50)	1 (10)	—	3 (30)	1 (10)	18 (38)	8 (17)	—	17 (36)	4 (9)	7 (35)	2 (10)	—	8 (40)	3 (15)
Acquisition of jewellery	25 (45)	4 (7)	—	23 (41)	4 (7)	14 (41)	3 (9)	—	13 (38)	4 (12)	17 (37)	3 (7)	—	19 (41)	7 (15)

In brackets the figures are given in %

rn—mother, dil—daughter-in-law, ud—unmarried daughter, f—father, s—son.

The men's perceptions do not show clear differences among the economic strata, which might again be due to their rigid adherence to the traditional value system.

4.2.1.4.2 Participation in Discussion of Family Matters

Tables 10 and 11 show the participation of the various family members in the discussion of family affairs.

With regard to the question who participates in a discussion of family matters, the differences between men's and women's perceptions vanish. However, in the big owners' group, women less frequently stress the participation of daughters-in-law in discussion; and in the small owners' group, the participation of unmarried daughters; and accordingly the responses of both women and men show a similar picture.

In the big owners' group the father and the mother participate equally in all discussions. Sons and daughters also participate, but only in one-third to half of all cases. Sons are more frequently involved in matters concerned with fishing; daughters more frequently with household affairs.

In the small owners' families the roles of the father and the mother are more pronounced because the number of nuclear families without married sons and daughters-in-law and older unmarried children is greater. The same is even more true for labourers' families. In addition to the characteristics already mentioned here, unmarried daughters have hardly any say in family matters.

By and large, the differences occurring among the economic strata are more or less caused by the different family types prevailing in the different strata.

4.2.1.4.3 Participation in Decision-making

Tables 12 and 13 show the decision-making patterns in the three economic strata separately from the point of view of male and female respondents.

Table 12 : Participation in Decision-making (Men's Perception)

Activity	Labourers					Small owners					Big owners				
	m	dii	ud	f	s	m	dil	ud	f	s	m	dil	ud	f	s
House construction	10 (42)	—	—	13 (54)	1 (4)	10 (43)	—	—	13 (57)	—	16 (48)	—	—	16 (48)	1 (4)
Acquisition of household goods	15 (65)	—	—	7 (30)	1 (4)	16 (67)	—	—	8 (33)	—	17 (59)	—	—	11 (38)	1 (3)
Sending children to school	9 (45)	—	—	10 (50)	1 (5)	9 (60)	—	—	5 (33)	1 (7)	9 (38)	2 (8)	—	12 (50)	1 (4)
Medical treatment	16 (47)	—	—	17 (50)	1 (3)	15 (43)	—	—	20 (57)	—	12 (43)	—	—	15 (54)	1 (4)
Celebration of festival	20 (63)	—	—	12 (37)	—	20 (53)	—	—	16 (42)	2 (5)	13 (48)	1 (4)	—	13 (48)	—
Purchase of craft and gear	—	—	—	—	—	9 (41)	—	—	12 (55)	1 (5)	13 (43)	—	—	14 (47)	3 (10)
Selection of spouse	10 (29)	—	6 (18)	12 (35)	6 (18)	13 (50)	—	—	13 (50)	—	14 (38)	1 (3)	4 (11)	10 (27)	8 (22)
Savings	17 (71)	—	—	7 (29)	—	11 (65)	—	—	6 (35)	—	21 (66)	1 (3)	—	10 (31)	—
Acquisition of jewellery	—	—	—	—	—	—	—	—	—	—	5 (83)	—	—	1 (17)	—

Table 13: Participation in Decision-making (Women's Perception)

Activity	Labourers				Small owners					Big owners					
	m	dii	ud	f	m	dil	ud	f	s	m	dil	ud	f	s	
House construction	13 (37)	1 (3)	—	20 (57)	1 (3)	10 (43)	1 (4)	—	16 (43)	2 (9)	6 (30)	1 (5)	10 (50)	3 (15)	
Acquisition of household goods	17 (52)	1 (3)	—	14 (42)	1 (3)	14 (56)	2 (8)	—	7 (28)	2 (8)	10 (43)	1 (4)	—	9 (39)	3 (13)
Sending children to school	3 (50)	—	—	3 (50)	—	10 (59)	2 (12)	—	5 (29)	—	8 (42)	1 (5)	—	8 (42)	2 (11)
Medical treatment	15 (47)	—	—	16 (50)	1 (3)	18 (44)	2 (5)	—	19 (46)	2 (5)	16 (57)	1 (4)	—	10 (36)	3 (4)
Celebration of festivals	17 (50)	—	—	16 (47)	1 (3)	22 (50)	2 (5)	—	19 (43)	1 (2)	14 (50)	1 (4)	—	10 (36)	3 (11)
Purchase of craft and gear	—	—	—	—	—	14 (36)	—	—	22 (56)	3 (8)	5 (23)	—	—	13 (59)	4 (15)
Selection of spouse	12 (36)	1 (3)	1 (3)	17 (52)	2 (6)	21 (48)	—	1 (2)	19 (43)	3 (7)	10 (31)	2 (6)	—	16 (50)	4 (13)
Savings	10 (48)	—	—	10 (48)	1 (4)	13 (68)	1 (5)	—	5 (26)	—	7 (70)	1 (10)	—	2 (20)	—
Acquisition of jewellery	—	—	—	—	—	3 (60)	1 (20)	—	1 (20)	—	10 (43)	1 (4)	—	9 (39)	3 (13)

Likewise the perceptions of men and women differ only slightly in the case of participation in decision-making. The general decision-making pattern in all the economic strata is that the father and the mother decide together, in a few cases joined by the sons or the daughters-in-law. The mother dominates decisions related to savings, acquisition of household goods and celebration of festivals, while the father dominates decisions with regard to house construction and purchase of craft and gear.¹

The only difference that we find among the economic strata is that, according to both women and men, the participation of sons and daughters-in-law in decision-making increases with rise in the economic **Status**.

This is simply due to the fact that in the higher economic strata the number of extended families and of married sons and daughters-in-law is higher.

As to differences between the perceptions of men and women, it needs to be mentioned that women see a greater significance in decision-making by daughters-in-law than men do.

4.2.2 Economic Stratification and Socialization

Socialization is the process by which an individual incorporates attitudes, behaviours, knowledge and skills which are considered appropriate by society and particularly by the subculture or group to which the individual belongs. Socialization involves identity formation and conscience development which are both **related** to intra-personal and interpersonal adjustment. (See Adams 1980, p. 167).

Socialization is a life-long process in which the individual plays both active and passive roles and by which individuals get in contact with various socializing agents and agencies.

The significance of family as socializing agency lies, among other things in identity formation and particularly in the case of traditional peasant and fisherfolk families in vocational socialization.

1 **Inher study of three fishing villages** in Tamil Nadu, Drewes (1982, p. 19) stresses the important role of women in **decision-making about purchase of craft and gear; which differs from our findings.**

With regard to the first aspect, expectations and attitudes of parents towards children's behaviour are important factors. Regarding the second aspect, initiation of children into work by other family members has to be examined.

In the following sections the socialization of the children of the Teiugu fisherfolk in South Orissa is analysed to see whether it reflects the different economic functions and tasks performed by the different economic strata with regard to occupation and environment.

The following variables are examined : educational status of children, initiation into work, expected behaviour of children, attitude towards children's future occupation. Households belonging to the higher economic strata also perform, to a limited extent, the management, marketing and finance functions for which skills such as reading, writing and numeracy are usually transferred by formal school education. Therefore, we shall first look at the educational status of children to see whether parents have these experiences passed on to their children by arranging for their school education.

4.2.2.1 Educational Status of Children

The following table shows the educational status of children of schoolgoing age in the three strata :

Table 14 : Educational Status of Children of Schoolgoing Age vs. Economic Stratum

Economic Stratum	Educational Status	Uneducated	I-III Standard	IV-V Standard	VI-VIII Standard	Total No. of Children
Labourers	37 (90%)	3 (7%)	1 (2%)	—	41 (99%)	
Small owners	47 (92%)	2 (4%)	1 (2%)	1 (2%)	51 (100%)	
Big owners	49 (78%)	10 (16%)	2 (3%)	2 (3%)	63 (100%)	

The figures indicate a tendency towards a higher educational status in the 'big owner' category : this shows that parents pass on **their** own experience and the requisite qualifications to their children even though the differences among the economic strata are comparatively small.

We shall now see whether this holds **good** also for initiation into household work and occupation,

4.2.2.2 Initiation into Work

Table 15 shows at what age children in the three economic strata are usually initiated into various tasks.

It has to be noted that, as compared to boys, girls are initiated into fish marketing and processing more frequently in the big owner group than in the other two strata.

On the whole, however, the number of children initiated into fish marketing and processing is higher in the households of the labourers' and small owners' groups than *in* those of the big owners' group. This finding agrees with our earlier finding that, in the perception of the men fish marketing is more often done by members of households having a lower economic **status**.

Another difference seen with regard to initiating children into gardening and animal keeping, which is more often done in families belonging to the 'big owner' category, most likely because they can more easily afford to keep animals and maintain a garden than families with lower economic status can.

The third difference to be noted **is** that children, particularly girls, in the labourers' group **are** more often initiated into the management of family finance than children in the other two strata.

Otherwise a similar picture emerges for the three strata as far as age of initiation into work and sex of child are concerned. Initiation into household work takes place at a little earlier age than initiation into occupational tasks. The generally young age of initiation into work may be noted.

4.2.2.3 Expected Behaviour of Children

Table 16 shows what type of behaviour parents expect from their children in the three economic strata. Parents' expectations of the behaviour and future of their children are factors which influence the process of socialization and thereby the development of the personality of a child. Expectations of parents usually reflect their own living conditions, work, education etc. We shall see whether the economic **status** plays a role as a discriminating factor,

Table 15 Initiation into Work

Economic Stratum	Labourers			Small owners			Big owners		
	female children	male children	average age	female children	male children	average age	female children	male children	average age
Activity									
Cooking	28(100)		9.4	25(100)		7.7	27(100)	—	8.1
Washing/cleaning	28(100)		7.6	25(100)	—	7.4	25(100)	—	8.1
Carrying water	28(100)		7	25(100)	—	6.7	25(100)		7.3
Firewood collection	28(100)		8.3	25(100)	—	8.2	26(100)	—	7.5
Shopping	21(65)	11(34)	7.2	25(71)	10(29)	7.7	26(68)	12(32)	7.6
Child care	28(76)	9(24)	7.1	25(83)	5(17)	7.3	25(74)	9(26)	6.7
Gardening	1(50)	1(50)	8				4(80)	1(20)	7.5
Tailorinp	9(56)	7(44)	8.6	—		7.7	11(69)	5(31)	7.2
Management of family									
Finance	28(68)	13(32)	11.9	20(71)	8(29)	11.3	16(73)	6(27)	10.1
Animal keeping	1(100)	—	6		—	—	5(43)	5(57)	7.2
Marketing/processing fish	11(28)	28(27)	12.2	6(22)	21(78)	11.5	10(50)	13(50)	10.3
Fishing	—	28(100)	10.2	—	25(100)	10	—	28(100)	9.9

The figures in brackets are given in per cent.

The table gives the number of cases where families could answer the question from their own experience. Therefore the number of children initiated into a certain type of work is sometimes less than the number of households in the respective category.

The following conclusions can be drawn with regard to differences in the expected behaviour of sons in the three economic strata, according to the answers of the male respondents.

Male respondents from the owner strata stress the importance of their sons becoming good and hardworking fishermen for their own benefit more often than male respondents belonging to the labourer's category. Accordingly male respondents from the owner strata stress less often than those belonging to the labourer category the need for their sons to support them economically. The expectation to see the son studying in school is more often mentioned in the higher economic strata.

The number of indifferent answers with regard to the expected behaviour of sons is higher in the lower economic strata.

Regarding the expected behaviour of daughters, male respondents from the owner category more often want their daughters to earn a good name in the house of the in-laws, and (only in the big owner category) to study and develop a good character while the labourers' and also the small owners' categories emphasize more the aspect of their daughters earning money for the parents and supporting them.

While the male respondents clearly express expectations which reflect the economic status and related living conditions, this is only partly true for the female respondents.

Regarding the expected behaviour of boys, the only differences are that, in the lower economic strata, more often mothers stress the importance of the son becoming a good skillful fisherman for his own benefit, while mothers belonging to the ownership strata more often stress the need for school education and development of a good character.

In the case of girls, mothers from the labourer group express even more often than mothers from the owner categories the expectation that their daughters should earn a good name in the house of the in-laws and thereby in society and less often they wish that their daughters should help the parents in the household.

Table 16 : Expected Behaviour of Children vs. Economic Stratum¹

Expected behaviour of boys and girls	Economic stratum male/female	Labourers		Small owners		Big owners	
		male resp.	female resp.	male resp.	female resp.	male resp.	female resp.
earn money for parents, support them in old age, repay parents debts, respect parents		13 (46%)	4 (14%)	1 (3%)	3 (10%)	4 (14%)	2 (8%)
hardworking, good manners , good future, learn fishing well, no bad habits		8 (29%)	21 (75%)	25 (83%)	18 (60%)	12 (43%)	13 (46%)
honest, pleasant manners, respect for elders		3 (11%)	—	—	8 (27%)	9 (32%)	9 (32%)
study in school, achieve something in life, good character		—	—	1 (3%)	1 (3%)	3 (11%)	11 (39%)
as children like		1 (4%)	—	—	—	—	—
nosons		1 (4%)	2 (8%)	—	—	—	—
indifferent/no answer		2 (8%)	—	3 (10%)	—	—	—

Expected behaviour of boys

Expected behaviour of girls	learn household work, get good husband	—	21	10	4	3	7
	earn good name in in-laws house	—	(75%)	(30%)	(13%)	(11%)	(25%)
	help mother, get married, learn household work	12	1	14	8	8	8
		(43%)	(4%)	(47%)	(27%)	(28%)	(28%)
	earn money for family by work as labourer (coolie, etc)	3	4	5	—	—	4
		(11%)	(14%)	(17%)	—	—	(14%)
	study in school, honest	—	2	—	—	2	2
		—	(8%)	—	—	(8%)	(8%)
	have a good character	—	—	—	—	1	—
		—	—	—	—	(4%)	—
be obedient	—	—	—	—	—	4	
	—	—	—	—	—	(14%)	
indifferent/no answer	13	—	1	18	14	3	
	(46%)	—	(3%)	(60%)	(50%)	(11%)	

1. The percentage figures refer to the total numbers of respondents in each stratum.

With regard to school education and earning money by wage labour, no significant differences are shown by mothers from the three economic strata.

Thus differences in the economic status seem to be communicated to children more often through expectations of fathers, while expectations of mothers follow other criteria obviously and do not reflect the economic status in the first place. This result is to be seen on the background of the economic stratum defined with reference to the occupation of the head of the family.

4.2.2.4 Expectations of Children's Future Occupation

Table 17 shows parents' expectations of their children's future occupation.

Looking at the answers of the male respondents, we note the following differences among three strata.

With regard to the occupational future of boys, respondents belonging to the owners' strata want their sons more often to complete schooling and also consider a salaried job, even though the number of cases is comparatively small.

While in all the strata fishing is the predominant occupational choice, the reasons given by the respondents clearly differ among the three strata.

Respondents belonging to the labourer and small owner strata justify their choice by adducing the reason that there is no other opportunity than fishing, while respondents from the big owner stratum justify their preference with the argument that there is good future in fishing or that fishing is at least as good as any other occupation.

Regarding the occupational future of girls, the response in all the strata is indifference, most likely because girls are anyhow expected to marry and not to take up any occupation. Only in the labourer group do some respondents expect their daughters to work as coolies. The expectations of the female respondents do not differ significantly from those of the male respondents, except for the lack of respondents from the labourers stratum who want girls to work as wage labourers.

Table 17 : Expectation of Children's Future Occupation vs. Economic Stratum¹

Expectation	Economic Stratum male/female	Labourers		Small owners		Big owners	
		male resp.	female resp.	male resp.	female resp.	male resp.	female resp.
Education and salaried job or fishing		—	1 (4%)	3 (10%)	1 (3%)	3 (11%)	5 (18%)
Fishing		23 (82%)	26 (93%)	24 (80%)	28 (93%)	24 (86%)	23 (82%)
Boys	Son shall decide	1 (4%)	—	1 (3%)	—	—	—
	Noson	1 (4%)	1 (4%)	1 (3%)	—	—	—
	Indifferent	3 (11%)	—	1 (3%)	1 (3%)	1 (4%)	—
Girls	Learn household work and marry	3 (11%)	2 (7%)	1 (3%)	1 (3%)	1 (4%)	5 (18%)
	Study in school and marry	—	—	—	—	1 (4%)	1 (4%)
	Work as coolie and marry	9 (32%)	—	—	—	—	—
	Indifferent	16 (57%)	26 (93%)	29 (97%)	29 (97%)	26 (79%)	22 (79%)

¹The Percentage figures refer to the total number of respondents in each stratum.

Table 18 : Perception of Future of Trade vs. Economic Stratum

Economic Stratum	Cognitive Pattern	Optimistic	Pessimistic	Indifferent	No answer	Total
Labourers' group		10 (38%)	12 (43%)	6 (21%)	—	28 (102%)
One boat and one net owners' group		4 (13%)	18 (60%)	5 (17%)	3 (10)	30 (100%)
several boats and several nets owners' group		13 (46%)	7 (25%)	5 (18%)	3 (11%)	28 (100%)
Total		27 (31 %)	37 (43 %)	16 (19 %)	6 (7%)	86 (100%)

4.2.3 Economic Stratification and Cognitive Patterns

Differences in the perceptions of the environment among the economic strata are analysed on the basis of the attitudes towards the future of the trade/perceptions and of causes for cyclones/storms and good/poor catch.

4.2.3.1 perception of Future of Trade

The above table shows the attitudes prevailing in the three strata towards the future of fishing.

The table shows that big owners and labourers are comparatively more optimistic than small owners. The reason might be that big owners while employing a substantial part of the labourers, operate a varied set of fishing gear, which ensures good income opportunities throughout the year while small owners are rather limited in their fishing method, which can result in a poor income if the fishing season for certain species, which they are equipped for, fails.

In absolute terms, however, only respondents belonging to the big owner group are more optimistic than pessimistic, while the opposite is the case in the two other strata. As reasons for their pessimistic views, respondents usually mention over-exploitation of fish stocks by mechanized as well as by non-mechanized boats.

4.2.3.2 Perception of Nature

The perception of nature has been analysed with the help of two indicators : the perceptions of causes for cyclones and the Perceptions of causes for a good and a bad catch.

The answers have been classified according to whether they cite supernatural causes or give realistic explanations’.

As natural causes for a good catch, the respondents mention a good rainy season, proper water currents, movement of the current called ‘Vodiri’, calm sea and availability of shoals of fish, while a bad catch was due to unfavourable water currents, rough sea, tidal waves, and failure of rain.

Under supernatural causes the following cognitive patterns have been summarized : Destiny, luck and will of God as reasons for a good catch; and sin, bad fate, ill luck, punishment of God, failure to perform poojas, misunderstandings, evil eye, conflicts in the village as reasons for a bad catch

With regard to causes of storms and cyclones, the following have been considered realistic explanations : high tides, waves and rough sea, fierce wind and rain, strong west winds, and concentration of clouds and high air pressure. As supernatural causes of storms and cyclones : sin, fate, bad luck, God’s punishment for neglecting prayers or non-performance of pooja, and God’s will and calculation, etc. have been mentioned by the respondents.

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1. A detailed description of **cognitive** patterns of West Bengal fishermen is given by Raychaudhuri (1980, p. 58-80) with regard to the sequence of tide and ebb, navigation, currents, topography of sea bed, fish behaviour and fishing **method** etc.

Table 19 : Perception of Causes for Cyclone vs. Economic Stratum

Economic stratum	Cognitive Pattern	Super-natural	Natural	Mixed	Indifferent	Total
Labourer group		7 (25%)	9 (32%)	1 (4%)	11 (39%)	28 (100%)
Small owner group		11 (37%)	7 (23%)	3 (10%)	9 (30%)	30 (100%)
Big owner group		6 (21%)	8 (29%)	1 (4%)	13 (46%)	28 (100%)
Total		24 (28%)	24 (28%)	5 (6%)	33 (38%)	86 (100%)

Table 20 Perception of Causes for good/poor Catch vs. Economic Stratum

Economic stratum	Cognitive Pattern	Super-natural	Natural	Mixed	in-different	No answer	Total
Labourer group		13 (46%)	11 (39%)	4 (14%)	—	—	28 (99%)
Small owner group		14 (47%)	1 (50%)	—	1 (3%)	—	30 (100%)
Big owner group		12 (43%)	13 (46%)	3 (11%)	—	—	28 (100%)
Total		39 (45%)	39 (45%)	7 (8%)	1 (1%)	—	86 (99%)

Both the tables show that there are no significant differences which could be logically explained in the context of the economic strata.

The reason for the lack of difference might be the fact, which has been mentioned earlier, that there is hardly any differences among the strata with regard to the working pattern maintained on the sea while sailing, navigating *or* fishing.

Thus the 'egalitarian work group structure' results in more or less uniform perceptions of nature, not influenced by the economic stratum.

4.3. Family, Socialization Process and Cognitive Patterns in different Economic Strata of Oriya and Bengali Artisanal Marine Fisherfolk of North Orissa.

The analysis of the role of economic stratification among the Oriya and the Bengali artisanal marine fisherfolk of North Orissa is based on a sub-sample comprising 126 fisherfolk households, of which 36 (29%) are labourers not owning any fishing craft and gear while 39 (31%) are owners of fishing gear, and 51 (40%) own fishing gear as well as fishing boats.

As in the previous part, the three economic strata are compared as to whether the type and structure of family, socialization process and cognitive patterns reflect differences in economic status and function.

In the case of the Oriya and the Bengali fisherfolk of North Orissa, however, some of the data collected during the field survey could not be analysed later on, because of doubts regarding their reliability and validity while other information could not be obtained at all for lack of frankness on the part of the respondents.

Thus, variables such as women's perception of the division of labour and the decision-making pattern within the family, women's expectations of the behaviour of their children and the children's occupational future, the division of labour among the male members of the family, the division of labour among the female family members, the formation and break-up of families, and the educational status of children have not been included in the comparison of the three economic strata.

4.3.1 Economic Stratification and Family

Three aspects of family life are analysed here : type and size of family, division of labour, and decision-making pattern.

4.3.1 .1 Family Type and Size of Family

The following tables show the types of families found in the three economic strata as well as the average family size. The families are categorized into nuclear families, lineally and collaterally extended families.

Table 21 : Family Type vs. Economic Stratum

Type of Family	Economic Stratum	Labourers	Net Owners	Boat and Net Owners
Nuclear		14 (39%)	18 (46%)	12 (24%)
Lineally extended		13 (36%)	14 (36%)	15 (29%)
Collaterally extended		9 (25%)	6 (15%)	23 (45%)
Lineally collaterally extended			1 (3%)	1 (2%)
No. of respondents		36 (100%)	39 (100%)	51(100%)

Table 22 : Size of Family vs. Economic Stratum

Economic Stratum	Family size
Labourer	7.8
Net Owner	7.7
Boat Owner	8.1

Boat and net owners live more frequently in collaterally extended families and less frequently in nuclear families, as compared to labourers and net owners.

As it has already been observed in the case of South Orissa, this pattern suggests with the ownership of assets, the family assumes the function of a production unit e.g. participation in fishing operations, fish sales, recruitment of team members etc. and therefore

frequently comprises more than one married couple in the form of either lineally or collaterally extended families, who jointly own and operate the productive assets.

The size of boat and net owner families, however, is only slightly larger than the size of families belonging to the labourer and net owner categories which is different from what has been observed in South Orissa: where the family size increased considerably in the higher economic strata while being generally smaller than in North Orissa.

A reason for the equally large family size in all the economic strata in North Orissa might be that those families which have a lower economic status in fishing might compensate this by secondary occupations like for example, agricultural labour which again provides sufficient income to sustain a large family.

Unlike in South Orissa the correlation between economic stratum and family type does not hold good for labourer and net owner households. On the contrary, even though labourers have a lower economic status in fishing, they live more often in extended families when compared to net owners, while the family size is about the same. They possibly compensate for their lower economic status in fishing by secondary occupations in agriculture.

The differences between the Telugu fisherfolk of South Orissa and the Oriya and the Bengali fisherfolk of North Orissa mentioned above, have to be seen in the background of their traditional caste occupations, which as described in chapter 4, are exclusively marine fishing in the south and river fishing and agriculture in the north. These differences also account for the larger family size found in North Orissa as well as the larger number of extended families as compared to nuclear families.

4.3.1.2 Division of Labour in the Family

In the following tables, the division of labour among the members of the households interviewed is shown. The activities listed can be broadly classified into household work carried out in the house or close to the house such as cooking, cleaning, washing, child care, house repair, gardening, tailoring, animal keeping, management of family finance, household work outside the house

such as firewood collection, shopping, water carrying and sometimes washing and fisheries-related activities like fishing, formation of fishing teams, net weaving, procurement of equipment, fish marketing, and management of fishery finance.

Table 23 : Division of Labour in Household-Labourer Group¹

Activity	Family members	Exclusively by women	Exclusively by men	By both
Cooking		40	—	—
Firewood collection		39	2	1
Shopping		4	44	2
Washing		48	—	—
Cleaning		41	1	—
Child care		35	—	—
House repair		4	38	5
Gardening		7	24	—
Tailoring		8	18	—
Carrying water		46	—	—
Management of family finance		1	29	9
Animal keeping		17	9	—
Fish marketing		8	23	8
Fishing			46	—
procurement of fishing equipment		4	15	—
Formation of teams			10	—
Management of fishery finance		3	31	6
Net weaving or mending		—	—	—

¹The tables 23, 24 and 25 show the number of household members involved in the respective activities.

Table 24 : Division of Labour in Household--Net Owner Group

Activity	Family members	Exclusi - vely by women	Exclusi- vely by men	By both
Cooking		45		
Firewood collection		38	21	—
Shopping		—	46	5
Washing		45	—	-
Cleaning		47		
Child care		41	47	
House repair		2	18	1
Gardening		6		5
Tailoring		13	3	
Carrying water		51	32	
Management of family finance			10	10
Animal keeping		28	15	1
Fish marketing		5	25	3
Fishing			57	
Procurement of fishing equipment		2	45	1
Formation of teams		—	38	
Management of fishery finance		2	32	5
Net weaving or mending		7	4	4

Table 25 : Division of Labour in Household-Boat and Net Owner Group

Activity	Family members	Exclusively by women	Exclusively by men	By both
Cooking		65	—	—
Firewood collection		53	7	
Shopping		2	67	3
Washing		60	—	—
Cleaning		61	—	
Child care		55	1	2
House repair		1	56	—
Gardening		12	27	8
Tailoring		18	—	—
Carrying water		55	—	3
Management of family finance			47	6
Animal keeping		38	7	2
Fish marketing		1	37	2
Fishing		—	70	
Procurement of fishing equipment		—	52	—
Formation of teams		—	54	
Management of fishery finance		—	54	1
Net weaving or mending		—	3	6

As already seen in the case of the Telugu fisherfolk in South Orissa, the three economic strata do not show significant differences with regard to the division of labour among family members except for a slightly more prominent role of women in the lower economic strata with regard to fisheries-related activities such as fish marketing, management of fishery finance, and procurement of fishing equipment.

However, these activities are predominantly or even exclusively taken care of by men in all the economic strata, besides other fisheries-related activities like formation of fishing teams, fishing and household activities, looking after the financial affairs of the family and shopping. An activity, which is generally carried out by both men and women, but more often by women, is net weaving, except for the labourer group. Gardening in the net owner group is more often done by women, too, while in the labourers' and big owners' group gardening is more often done by men. Household activities such as cooking, washing, cleaning, firewood collection, child care and tailoring are predominantly or exclusively looked after by women except that men take care of tailoring more often than women in the labourer group, while in the net owner group both women and men are responsible for child care.

When compared to the Telugu fisherfolk of South Orissa, the role of women among the Oriya and the Bengali fisherfolk in North Orissa is considerably less prominent. Oriya and Bengali fisherwomen play only a very minor or no role in fisheries-related activities such as the management of fishery finance, fish marketing and processing, and also in out-door household work such as shopping and gardening (exception: net owner group) as well as in the management of family finance while among the Telugu fisherfolk of South Orissa all these activities are predominantly taken care of by women.

4.3.1.3 Decision-making Pattern

The decision-making pattern of the families of the Oriya and the Bengali fisherfolk in North Orissa is analysed under two aspects, viz. the verbalization of family matters and the participation of family members in decision-making.

4.3.1.3.1 Verbalization of Family Matters

The following table shows whether family matters are discussed in the family or not.

Table 26: Verbalization of Family Matters vs. Economic Stratum

Activity	Economic Stratum					
	Labourers		Net Owners		Boat Owners	
Verbalization	Discussed	Not discussed	Discussed	Not discussed	Discussed	Not discussed
House construction/repair	34(94%)	2(6%)	36(92%)	3(8%)	51(100%)	—
Buying of jewels	26(72%)	10(28%)	34(87%)	5(13%)	49(96%)	2(4%)
Buying of vessels	35(97%)	1(3%)	34(87%)	5(13%)	50(98%)	1(2%)
Sending children to school	26(72%)	10(28%)	30(77%)	9(23%)	44(86%)	7(14%)
Medical treatment	35(97%)	1(3%)	36(92%)	3(8%)	49(96%)	2(4%)
Celebration of festivals	34(94%)	2(6%)	37(95%)	2(5%)	48(94%)	3(6%)
Purchase of craft/gear	21(58%)	15(42%)	33(85%)	6(15%)	48(94%)	3(6%)
Selection of spouse	27(75%)	9(25%)	35(90%)	4(10%)	46(95%)	5(5%)
Family planning	26(72%)	10(28%)	27(69%)	12(31%)	26(51%)	25(49%)
Savings	27(75%)	9(25%)	33(85%)	6(5%)	43(84%)	8(16%)

The table shows a high degree of verbalization of family matters. As in the case of the Telugu fisherfolk in South Orissa, differences occur mainly between the labourer group and the two other strata with regard to the purchase of craft and gear, buying of jewels, savings, selection of spouse and education of children. Labourer families might talk less frequently about these topics because they have less income to spend on jewels or to save than the two other groups, fewer opportunities to acquire fishing craft or gear, less attractive marriage proposals to consider because of their low economic and social status and because they can't easily afford to send their children to school.

Another interesting difference is that family planning is more often talked about in families belonging to the lower economic strata. This indicates that families owning craft and gear might see more opportunities to sustain a bigger family while this is not the case in labourer households.

4.3.1.3.2 Participation in Discussion of Family Matters

Table 27 shows the participation of family members in the discussion of family affairs.

The head of the family and his wife participate most frequently in discussions of family matters. Unlike in South Orissa, where both participate equally in the discussion of family matters, this is the case in North Orissa only in labourer households. In households of boat and net owners the head of the family dominates. Besides him and his wife, married sons also play a significant role in the discussion of family matters. Unlike in South Orissa, unmarried sons and daughters-in-law play only a very minor role when something is discussed in the family. Unmarried daughters have equally little say as among the Telugu fisherfolk of South Orissa.

4.3.1.3.3 Participation in Decision-making

Table 28 shows the decision-making patterns in the three economic Strata.

While the decision-making pattern in the labourer group is identical to the discussion pattern, the other two strata show a different picture. While the authority of the head of the family increases,

the authority of his wife decreases in households belonging to the net owner and the boat and net owner stratum.

In all the strata, the role of a married son in decision-making is similar to his role in the discussion of family matters.

Unmarried sons have hardly any say and daughters-in-law and unmarried daughters have no say at all. While the authority pattern of the head of a family is very rigid and does not seem to change with the subject of decision, the wife of the head of a family participates more often in decisions concerning household affairs and less often in decisions concerning savings, purchase of craft and gear and house construction. Married sons participate highest in decisions concerning purchase of craft and gear and house construction.

In the Telugu fisherfolk households, too, daughters-in-law, unmarried daughters and unmarried sons do not play any role in decision-making in the family. The authority pattern between the head of the family and his wife, however, is a more flexible and, democratic one, depending on the area of decision.

As already observed in the case of discussion pattern, the decision making pattern, too, does not reflect the **economic status** much, except for the trend that families belonging to the labourer stratum show a more balanced husband-wife authority pattern than families belonging to the boat and net and the boat owner category.

4.3.2 Economic Stratification and Socialization

The socialization of children of the Oriya and the Bengali fisherfolk is analysed under three aspects, namely the attitudes of parents towards the behaviour of their children., the parents' expectations of the future occupation of their children, and the initiation of children into work.

4.3.2.1 Initiation into Work

Table 29 shows at what age fisherfolk children of either sex are initiated in the various activities.

Table 27 : Participation in Discussion of Family-matters vs. Economic Stratum

Activity	Labourer						Net Owner						Boat Owner					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
House construction	29 (35%)	21 (25%)	2 (2%)	29 (35%)	3 (4%)	—	32 (41%)	17 (22%)	1 (1%)	26 (36%)	—	—	44 (37%)	33 (28%)	5 (4%)	32 (27%)	4 (3%)	1 (1%)
Buying of jewels	28 (39%)	17 (24%)	—	24 (34%)	2 (3%)	—	35 (42%)	15 (18%)	1 (1%)	29 (35%)	4 (5%)	—	41 (38%)	25 (23%)	2 (2%)	36 (33%)	2 (2%)	3 (3%)
Buying of vessels	32 (37%)	16 (19%)	—	32 (37%)	6 (7%)	—	35 (47%)	12 (15%)	1 (1%)	30 (37%)	4 (5%)	—	40 (36%)	25 (23%)	2 (2%)	34 (31%)	4 (4%)	5 (5%)
Sending children to school	14 (31%)	11 (24%)	—	19 (42%)	1 (2%)	—	28 (44%)	8 (13%)	1 (2%)	26 (41%)	—	—	35 (39%)	21 (24%)	1 (1%)	27 (30%)	2 (2%)	3 (3%)
Medical treatment	30 (38%)	18 (23%)	1 (1%)	25 (32%)	4 (5%)	—	37 (44%)	14 (17%)	1 (1%)	32 (38%)	—	—	38 (38%)	24 (24%)	1 (1%)	32 (32%)	2 (2%)	4 (4%)
Celebration of festivals	35 (41%)	14 (16%)	—	31 (36%)	6 (7%)	—	39 (44%)	17 (16%)	1 (1%)	34 (39%)	—	—	37 (38%)	20 (20%)	—	32 (33%)	5 (5%)	4 (4%)
Purchase of craft/gear	15 (35%)	10 (23%)	3 (7%)	14 (33%)	1 (2%)	—	36 (45%)	19 (24%)	1 (1%)	24 (30%)	—	—	36 (39%)	32 (34%)	2 (2%)	19 (20%)	3 (3%)	1 (1%)
Selection of spouse	21 (37%)	12 (21%)	—	21 (37%)	3 (5%)	—	35 (43%)	12 (15%)	6 (7%)	29 (35%)	—	—	33 (41%)	12 (15%)	4 (5%)	28 (35%)	2 (3%)	1 (1%)
Family planning	21 (47%)	4 (9%)	—	20 (44%)	—	—	19 (44%)	2 (5%)	—	16 (37%)	1 (2%)	5 (12%)	18 (45%)	3 (8%)	—	16 (40%)	2 (5%)	1 (3%)
Savings	20 (43%)	10 (22%)	—	16 (35%)	—	—	24 (41%)	9 (15%)	2 (3%)	20 (34%)	1 (2%)	3 (5%)	34 (45%)	20 (27%)	2 (3%)	17 (23%)	—	2 (3%)

1. Head of the family
2. Married son
3. Unmarried son
4. Wife of head of the family
5. Daughter-in-law
6. Unmarried daughter

Table 28: Participation in Decision-making vs. Economic Stratum

Activity	Labourer						Net Owner						Boat Owner					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	56	
House construction	29 (35%)	21 (25%)	2 (2%)	29 (35%)	3 (4%)	—	30 (55%)	13 (24%)	1 (2%)	10 (19%)	—	—	40 (55%)	28 (25%)	2 (3%)	13 (18%)	—	—
Buying of jewels	28 (39%)	17 (24%)	—	24 (34%)	2 (3%)	—	28 (54%)	8 (15%)	1 (2%)	15 (29%)	—	—	38 (52%)	18 (25%)	—	16 (22%)	1 (1%)	—
Buying of vessels	32 (37%)	16 (19%)	—	32 (37%)	6 (7%)	—	30 (55%)	7 (13%)	1 (2%)	17 (31%)	—	—	38 (51%)	18 (24%)	1 (1%)	16 (22%)	1 (1%)	—
Sending children to school	14 (31%)	11 (24%)	—	19 (42%)	1 (2%)	—	22 (54%)	7 (17%)	1 (2%)	11 (27%)	—	—	33 (52%)	17 (27%)	—	14 (22%)	—	—
Medical treatment	30 (38%)	18 (23%)	1 (1%)	25 (32%)	4 (5%)	—	31 (58%)	9 (17%)	1 (2%)	12 (23%)	—	—	35 (49%)	19 (27%)	—	16 (23%)	1 (1%)	—
Celebration of festivals	35 (41%)	14 (16%)	—	31 (36%)	6 (7%)	—	30 (55%)	9 (16%)	1 (2%)	14 (25%)	1 (2%)	—	36 (50%)	17 (24%)	1 (1%)	16 (22%)	2 (3%)	—
Purchase of craft/gear	15 (35%)	10 (23%)	3 (7%)	14 (33%)	1 (2%)	—	25 (60%)	10 (24%)	1 (2%)	6 (14%)	—	—	35 (52%)	17 (25%)	—	14 (21%)	1 (2%)	—
Selection of spouse	21 (37%)	12 (21%)	—	21 (37%)	3 (5%)	—	28 (53%)	8 (15%)	2 (4%)	15 (28%)	—	—	34 (59%)	9 (16%)	—	15 (26%)	—	—
Family planning	21 (47%)	4 (9%)	—	20 (44%)	—	—	15 (50%)	3 (10%)	—	12 (40%)	—	—	13 (62%)	—	—	8 (38%)	—	—
Savings	20 (43%)	10 (22%)	—	16 (35%)	—	—	21 (49%)	7 (16%)	—	5 (12%)	10 (24%)	—	28 (47%)	21 (36%)	—	10 (~17%)	—	—

1. Head of the family
2. Married son
3. Unmarried son
4. Wife of head of the family
5. Daughter-in-law
6. Unmarried daughter

Exclusively or predominantly girls are initiated into household activities which are either carried out indoors or do not involve dealings with people outside the family, such as cooking, washing, water carrying, firewood collection, child care and tailoring.

Exclusively or predominsntly boys are initiated into household works as shopping and the management of family finance, which have something to do with handling money and dealing with people outside the house and sometimes the village, such as shop-keepers.

Boys and girls are initiated into fisheries-related and subsidiary occupations, carried out in or close to the house, e.g. net weaving, animal keeping, gardening.

A comparison of the various economic strata reveals two differences.

The lower the economic strata, the younger the age at which children are initiated into work.

The lower the economic strata, the larger the number of girls initiated into collecting or buying and selling of **fish**.

When compared to the children of the Oriya fisherfolk in South Orissa, it is noticed that the average age of initiation into work of the children of the Oriya and the Bengali fisherfolk in North Orissa is considerably higher. Differences with regard to the role of women between North and South Orissa, discussed earlier, are already prepared for through the initiation of children into work. While in South Orissa, predominantly girls are initiated into household activities which involve the handling of money and dealings with outside persons such as management of family finance and shopping, they are deprived of this role in North Orissa, where almost exclusively boys are initiated into these activities.

4.3.2.2 Expected Behaviour of Children

The parents' expectations of and attitudes towards their children's behaviour present a norm structure which influences the development of the personality of the child to a large extent while it reflects the parents' own environment and experiences.

Table 30 shows parents' expectations of the behaviour of their children in the three economic strata.

Table 29 Initiation into **Work** vs. Economic Stratum

Activity	Economic Stratum		Labourer			Net Owner					
	Female children	Male	Average age	Female children	Male	Average age	Female children	Male	Average age		
Fishing	—	35 (100%)	118	—	38 (100%)	13.4	—	47 (100%)	142		
Cooking	36 (100%)	—	9.8	37 (97%)	1 (3%)	111	47 (100%)	—	10.9		
washing/cleaning	36 (100%)	—	9.5	37 (97%)	1 (1%)	106	47 (96%)	2 (4%)	103		
Water carrying	36 (100%)	—	8.8	36 (84%)	7 (16%)	99	47 (94%)	3 (6%)	10.1		
Firewood collection	34 (92%)	3 (8%)	102	30 (81%)	7 (19%)	99	43 (83%)	9 (17%)	96		
Shopping	15 (31%)	34 (69%)	10.5	8 (18%)	37 (82%)	109	12 (20%)	47 (80%)	115		
Child care	36 (100%)	—	8.7	36 (92%)	3 (8%)	10.7	47 (94%)	3 (6%)	98		

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Gardening	8 (50%)	8 (50%)	103	13 (43%)	17 (57%)	104	19 (42%)	126 (58%)	112
Tailoring	12 (92%)	1 (8%)	112	14 (100%)		116	16 (100%)	—	12'9
Management of family finance	1 (4%)	36 (96%)	164	1 (3%)	37 (97%)	17.5	—	45 (100%)	182
Marketing/Processing of fish	18 (34%)	35 (66%)	12.8	7 (18%)	31 (82%)	156	5 (15%)	29 (85%)	15.9
Animal keeping	22 (52%)	20 (48%)	9.3	28 (62%)	17 (38%)	106	32 (68%)	15 (32%)	11.4
Net weaving or mending or making cowdung cake	1 (50%)	1 (50%)	10.5	10 (63%)	6 (37%)	11.4	8 (62%)	5 (38%)	13.4

Table 30 : Expected Behaviour of Children vs. Economic Stratum

Expected behaviour of boys/girls	Economic stratum	Labourer	Net Owner	Boat Owner
For Boys	Hard working, good manners, good future, obedient	17(47 %)	21 (54%)	37(30%)
	Obedient and should pay respects to elders	7(19%)	6(15%)	3(6%)
	Honest, pleasant manners, respect caste elders	1(3%)		4(8%)
	Study in school, achieve something in life, good character	4(11 %)	7(18%)	3(60%)
	Well behaved and should learn methods of fishing	—	2(5%)	1(2%)
	No sons	4(11%)	1(3%)	1(2%)
	Indifferent/no answer	3(8%)	2(5%)	3(6%)
	For Girls	Learn household work, get good husband and be a good housewife	2(6%)	9(23%)
Study in school, obedient		2(6%)	5(13%)	6(12%)
Obedient		12(33%)	12(31 %)	18(35%)
Learn household work and work like their mothers		4(11%)		1(2%)
No female child		5(14%)	4(10%)	4(8%)
Indifferent/no answer		11(31%)	9(23%)	7(14%)

The table indicates differences among the three groups, which clearly reflect the different socio-economic context. The higher the economic stratum, the more important are characteristics like “good manners”*, which also incorporate among other things personal initiative (“hard working”) and optimism (“good future”).

In families, which have their own boats and nets, personal initiative and optimism are essential to keep the ‘family enterprise’ alive, while they are not so much required in labourer families¹. On the other hand obedience and respect (“obedient and should show respect for the elders”) play a more important role in labourer and net owner families because they have to work under the instruction of others.

Another interesting difference to be noted among the various economic strata is that studying in school is considered more relevant in net owner and labourer families than in boat and net owner families, which is contrary to the observations made in South Orissa.

As far as expectations of the behaviour of girls are concerned, obedience is the most important expectation in all the economic strata. Girls of the higher economic strata are expected to study in school more often than the girls of the lower strata, indifference towards a girl’s expected behaviour is more often found in the lower economic strata than in the higher economic strata.

While the fisherfolk’s uniform expectation of the future of their daughters is ‘marriage’, the following answers were given when asked which occupation they expect their sons to follow once they are grown up.

While in the labourers’ and net owners’ stratum, fishing is the first choice for a son’s future occupation, followed by a ‘salaried job’, this sequence is reversed in the boat and net owner stratum.

¹A similar trend has been observed among the Telugu fisherfolk of south Orissa.

Table 31 : Expectation towards Son's Future Occupation Vs. Economic Stratum

Expectation	Economic Stratum	Labourers	Net Owners	Boat Owners
Salaried job		12(33%)	11(28%)	18(35%)
Fishing		17(47%)	12(31%)	13(25%)
Business		—	1(3%)	1(2%)
Son shall decide		1(3%)	8(21 %)	12(24%)
Any occupation other than fishing		1(3%)	6(15%)	5(10%)
<u>Indifferent/no son</u>		5(14%)	1(3%)	2(4%)

A similar trend is denoted by the fact that boat and net owners and also net owners expect the son to take up 'any occupation other than fishing' more often than the labourers and also more often let the son decide on his future occupation instead of committing him to fishing.

The answers of the respondents indicate a trend that the higher economic strata among the Oriya and the Bengali fisherfolk of North Orissa have a tendency to opt out of sea fishing, if other opportunities are offered. This tendency, which is contrary to what has been observed among the Telugu fisherfolk of South Orissa, has again to be seen in the background of the traditional caste occupations of the fisherfolk of North Orissa, who unlike the marine fisherfolk of South Orissa followed other occupations such as river fishing, agriculture, village artisan's work etc.

4.3.3 Economic Stratification and Cognitive Patterns

The following paragraph examines whether economic status has become a discriminating factor with regard to the perception of trade and nature. The three economic strata are compared as to differences in perceiving the future prospects of fishing as an occupation, and in naturalistic and supernaturalistic reasoning about 'nature' in the form of storms and cyclones and a good and a poor catch.

4.3.3.1 Perception of Future of Trade

The following table shows the perceptions of the respondents of the various economic strata concerning the future of fishing as occupation. The answers, have been classified into optimistic, pessimistic and indifferent ones.

Table 32 Economic stratum vs. Perception of Future of Trade

Economic Stratum	Perception Optimistic	Pessimistic	Indif-ferent	No answer	Total
Labourer	11 (31%)	17 (46%)	1 (3%)	7(19%)	36
Net Owner	13 (33%)	16 (41%)		10(26%)	39
Boat Owner	26 (51%)	11 (21%)	1(2%)	13(26%)	51
Total	50 (40%)	44 (35%)	2(2%)	30 (24%)	126

Optimistic views are more in the higher economic strata, particularly in the boat and net owner stratum, while pessimistic answers are more often found in the lower economic strata.

The boat and net owners are the only economic stratum where the respondents hold optimistic views more often than pessimistic ones, as is the case, too, with the Telugu fisherfolk of South Orissa. The reason, again, might be that for owners of craft and gear, it lies more in their own hands to utilize the chances of getting a good catch and income, offered during the various fishing seasons for various fish species throughout the year, while labourers and net owners depend more on others to employ them or to join with them in a team. This is also brought out in the explanations given by the respondents.

Some of the fisherfolk belonging to the labourer category, for example, express the opinion that the future is uncertain, because of the uncertainty of the terms and conditions on which the boat and net owners will employ them. Many of the respondents from the labourer stratum who hold an optimistic view of the future attribute it to the prospect of being able to acquire a net and boat of their own before long. Respondents from the boat and net owner stratum and those from the net owner stratum holding pessimistic

views adduce declining fish resources, increasing numbers of artisanal fishermen, and natural calamities such as cyclones.

Optimistic views are often expressed by those respondents who have recently acquired additional fishing craft and gear or who hope to acquire it soon.

4.3.3.2 Perception of Nature

The fisherfolk's perceptions of nature have been analysed with the help of two questions: what are the causes of storms and cyclones? And what are the reasons for a good catch and a poor catch ?

The answers have been classified into supernatural explanations, natural explanations, mixed explanations and indifferent answers.

Table 33 : Perception of Causes of Cyclone vs. Economic Stratum

Economic Stratum	Perception	Super-natural	Natural	Mixed	Indif-ferent	Total
Labourers		2 (6%)	27 (75%)	1 (3%)	6 (17%)	36
Net owners		2 (5%)	27 (69%)	—	10 (26%)	39
Boat owners		8 (16%)	27 (54%)	—	16 (31%)	51
Total		12 (10%)	81 (64%)	1 (1%)	32 (25%)	126

Table 34 : Perception of Reasons for Good/Poor Catch vs. Economic Stratum

Economic Stratum	Perception	Super-natural	Natural	Mixed	Indif-ferent	Total
Labourers		20 (56%)	12 (33%)	2 (6%)	2 (6%)	36
Net owners		12 (31%)	24 (62%)	1 (2%)	2 (5%)	39
Boat owners		25 (49%)	25 (49%)	—	1 (2%)	51
Total		54 (45%)	61 (48%)	3 (2%)	5 (4%)	126

In the case of storms and cyclones, the majority of the respondents mention natural causes such as climatic changes, air pressure, winds blowing from certain directions, changes in temperature etc.

Only a very small number cites supernatural causes such as god's punishment, sin etc.

It is interesting to note, however, that respondents from the lower economic strata more often give natural explanations than respondents from the higher economic strata who favour supernatural explanations more. This trend however does not hold good for explanations of a good and a poor catch. Here the labourer stratum contains the largest share of supernatural responses. Thus it seems that perceptions of nature are not easily related to economic status, as it has already been observed and interpreted in the case of the Telugu fisherfolk of South Orissa.

4.4 Summary

The economic stratification among the Telugu fisherfolk of South Orissa is reflected by differences with regard to social institutions and sociopsychological processes such as the family and the socialization of children. In the case of the family, it is found that, with the ownership of assets, the number of extended families is increasing and the number of nuclear families declining because, in the owner households, the family assumes the function of a production unit.

Related differences are to be found with regard to the working pattern and decision-making pattern in the family. The higher the economic stratum, the more pronounced the participation and the role of married and unmarried sons, daughters and daughters-in-law.

Regarding socialization, we find differences among *the* economic strata in the initiation of children into work. In the lower economic strata children are initiated into fish marketing and processing more often than in the higher economic strata, because of the need to supplement the income from fishing by other sources of income. Children from the higher economic strata, again, are more

often initiated into gardening and animal keeping, an activity which is carried out by well-to-do families, owning some agricultural land and cattle.

Another difference among the economic strata is that children of the labourer families, particularly girls, are more often initiated into the management of family finance than children of the higher economic strata.

The parents' expectations of their children behaviour and future occupation also differ among the three economic strata. The higher economic strata stress initiative and education more often while the lower economic strata more often express the view that their children should support them economically.

Cognitive patterns with regard to nature do not show any differences in the three economic strata. The reason might be that, during fishing operations which constitute the most relevant exposure to nature, the differences among the economic strata vanish because owners also participate in fishing and there is hardly any clear separation of tasks on board of small fishing boats where reliance on reciprocal interdependence and coordination of crewmen are essential.

Regarding the perception of the future of their trade, big boat and net owners and labourers hold more optimistic views than small owners, most likely because big owners, while employing a substantial part of the labourers, operate a varied set of fishing gear, which allows them to participate in different fishing seasons throughout the year, while small owners due to their limited gear are more seriously affected by the failure of a single fishing season,

The economic stratification among the Oriya and the Bengali artisanal marine fisherfolk of North Orissa is reflected by the type of family the fisherfolk live in and by the familial communication, but hardly by the authority pattern and by the division of labour within the family.

Families who own boat and nets or only nets more often live in extended families than labourer families do. Extended families, belonging to the owner strata, jointly own and operate fishing craft

and gear and thereby function as production units. The size of the families does not differ significantly among the various economic strata. It is considerably larger than the size of the Telugu fisherfolk families in South Orissa, who live in nuclear families more often than the Oriya and the Bengali fisherfolk of North Orissa who have their occupational origins in agriculture and inland fisheries.

While the division of labour does not generally differ among the various economic strata, women play a more prominent role in fisheries-related activities in the lower economic strata.

Regarding the decision making pattern, the labourer families show a more democratic and flexible authority distribution between the head of the family and his wife as it is the case in the owner strata where the man clearly dominates all decision making in a rather rigid way. Furthermore families belonging to the owner strata discuss subjects like savings, education of children, acquisition of jewellery, craft and gear more often than labourer households.

Regarding the socialization of children however, differences show among the various economic strata in the parents' educational attitudes, revealed by their expectations of their children's behaviour, in parent's perceptions of their children's future occupation as well as in the initiation of children into work.

In the lower economic strata, children are initiated into work at an earlier age and girls belonging to the lower economic strata are initiated into fish marketing more often than girls from the higher economic strata. Parents belonging to the higher economic strata more often expect their sons to show initiative and work hard, while parents belonging to the lower economic strata regard obedience as more important.

Regarding the future occupation of their sons, parents from the higher economic strata expect them to have a salaried job in the first place or take up an occupation other than fishing, while among the labourer families fishing is the first choice as occupation for their sons. In the case of girls, the various strata hold the unanimous view that girls should be obedient and get married, except for a slightly higher proportion of respondents in the owner groups who want their daughters educated in school.

The future of fishing as an occupation in general is also viewed differently in the different economic strata. Boat and net owners hold more optimistic views than Labourers, who in turn more often express a pessimistic outlook. Optimistic opinions are often legitimated by claims to the ownership of a varied set of fishing craft and gear or by the prospects of acquiring it, so that various fishing seasons throughout the year can be exploited, while pessimistic views are explained on the grounds of the dwindling of marine resources consequent on the overexploitation by an increasing number of artisanal fishermen as well as by mechanized fishing boats, uncertain conditions and terms of employment (in the case of labourers) and natural calamities e.g. cyclones and floods.

Perceptions of nature concerning storms and cyclones and a bad and poor catch were not found to be related to the economic stratum, most likely because the respondents of all the economic strata had undergone similar experiences of nature as members of a crew or work group aboard small fishing boats.

The Influence of Traditional Caste Occupation on Present Economic and Occupational Status, Perception of Nature and Trade, Child Socialization and Religious Practises and Rituals

By R. Ray/U. Tietze

Even though marine fishing is carried out traditionally as a caste occupation in India, non-fisherfolk castes have lately been entering this profession in increasing numbers in its artisanal as well as mechanized form. The reasons for this trend are the increased demand for fish for home consumption, an increasing export market for marine products, particularly prawns, as well as a lack of alternative employment opportunities in agriculture, etc.

The entry of non-fisherfolk castes into artisanal marine fishing is, however, restricted to areas where environmental conditions such as natural harbours, creeks, rivers, lagoons, etc. make it possible to operate displacement boats as it is the case in the Balasore district of Orissa.

The surf-beaten open beaches of Tamil Nadu, Andhra Pradesh and South Orissa from where primarily log rafts are operated with an extraordinarily high amount of skill and experience, have hardly attracted any non-fisherfolk caste members yet, except for beach-based seine net operations.

This chapter examines whether traditional caste occupation still has a bearing in terms of economic and occupational status, in terms of variety and range of the fishing technology in operation, perception of nature and trade, child socialization and religious practises and rituals.

The findings are based on a sample of 126 fisherfolk families selected from six villages in the Balasore district of Orissa. 71 households belong to the traditional fisherfolk castes Kaibarta and Gokha while 55 households belong to other castes e.g. Khandayat, Teli, Gauda, Radhi, Tanti, Kumar and Barik.

Ethnically Balasore's fisherfolk consist of Oriyas and Bengalis of both fisherfolk and non-fisherfolk castes, the latter having taken up fishing either during this generation or one or two generations ago.

5.1 Economic and Occupational Status

As pointed out earlier traditional as well as non-traditional Oriya and Bengali fisherfolk practise agriculture and other trades as occupations during certain months of the year. The following table shows how many men/months each group spends per year on fishing and agriculture respectively and thereby compares their occupational status.

Table 1 : Traditional Caste Occupation vs. Present Occupational Status.

Traditional Caste Occupation	Present Occupational Status	Men/Month per Household & Year spent on	
		Fishing	Other Occupations : Agriculture, Artisan etc.
Fishing (n =71)		21.1	5.5
Non-fishing : agricultural labourers, peasants, artisans etc. (n=55)		16.6	6.0

Traditional fisherfolk spend more time on fishing, and slightly less time on secondary occupations than non-traditional fisherfolk. Thus the traditional caste occupation has still a bearing on the present occupational status, though mainly in terms of the engagement in fishing. The fact that there is hardly any difference with regard to secondary agricultural and artisanal occupations supports the earlier discussed assumption that other castes have partly taken to sea fishing because of the lack of traditional employment opportunities.

Regarding the present economic status in fishing, the following picture emerges for traditional and non-traditional fisherfolk.

Table 2 : Traditional Caste Occupation vs. Economic Status

Economic Status	Traditional Caste Occupation	Fishing (n=71)	Non-fishing (n=55)
Labourer		30%	24%
Net owner		46%	31%
Boat and Net owner		24%	45%

The economic status of traditional fisherfolk more or less compatible with the working pattern or operational pattern of the fishing technology. Boats are owned individually. They have a crew of 4-5 on an average. The majority of crew members contribute net pieces in order to get a share from the revenue from fishing.

Thus about one-fourth to one-fifth of the fisherfolk households are boat owners, the rest either labourers without assets or net owners, the latter being in the majority.

In the case of non-traditional fisherfolk, however the boat and net owners form the largest group. This suggests that non-traditional

fisherfolk gets into fishing more by contributing assets (boats) than by contributing skilled labour.

In the following we shall compare boat and net owners and net owners belonging to traditional fisherfolk castes and other castes with regard to the question, how many net pieces or boats they own on an average.

Table 3 : Traditional Caste Occupation vs. Ownership of Fishing Technology

Average no. of Technology used and owned by Household	Traditional Caste Occupation	
	Fishing (n=71)	Non-fishing (n = 55)
Average no. of Net Pieces owned by a Net Owner	8.1	1.7
Average no. of Net Pieces/ Boats owned by a Boat and Net Owner	Boats :	1.2
	Net Pieces :	53.9
		1.1
		4.1

The table shows that net owners as well as boat and net owners from traditional fisherfolk castes are far better equipped with fishing gear than those from non-traditional fisherfolk castes.

While net owners as well as boat and net owners from traditionally non-fishing castes are usually small owners, owners belonging to traditional fisherfolk castes, particularly those who own boats and nets, have a considerable number of assets. Here we examine the type of gear that are operated by both groups in order to explain the quantitative information in the table with qualitative details.

Table 4 : Traditional Caste Occupation vs. Variety of Fishing Craft and Gear

Type of Fishing Craft/Gear operated	Traditional Caste Occupation	Fishing (n=71)	Non-fishing (n=55)
Craft :			
Salti /Dinghy (small)		16 (94%)	7 (27 %)
Patia/Danga/Dinghy (large)/Teppa		—	19 (73 %)
Chhoat		1 (6%)	—
Craft, total :		17 (100%)	26 (100%)
Gear, marine :			
Gillnets		28 (26%)	1255 (95 %)
Encircling gillnet		9 (8%)	—
Dragnet		—	7 (0.5 %)
Tidal wallnet		—	1 (0.1 %)
Marine gear, total :		37 (34%)	1263 (96 %)
Gear, estuarine :			
Set bagnet		9 (8%)	26 (2%)
Stake net/gillnet		31 (29%)	14 (1 %)
Castnet		23 (21%)	14 (1%)
Longline		7 (7%)	1 (0.1%)
Estuarine gear, total :		70 (65%)	55 (4%)
Gear, total		107 (99%)	1318 (100%)

The table shows clearly that artisanal fisherfolk, whose traditional caste occupation is fishing almost exclusively own marine fishing gear, while the majority of gear owned by non-traditional fisherfolk consists of estuarine gear, which indicates that the first group practice their occupation predominantly in the open sea, while the latter one is confined to a large extent to estuaries and river-mouths.

Accordingly boats operated by non-traditional fisherfolk are almost exclusively the less sea-worthy types of Salti and small Dhingy, more suitable for estuaries, while traditional fisherfolk use the more sea-worthy types of boats such as Patia/Botali and large Dhingy.

5.2 Perception of Nature and Trade

Perceptions of nature have been studied with the help of two questions, the first one asking reasons for good and poor catch and the second one causes of cyclones. The explanations of the respondents have been classified according to the fact whether the respondents cited mainly natural or supernatural causes.

Natural causes of good or poor catch as mentioned by respondents were weather conditions, depth and layer of the sea where the net is set, influence of tide and currents, shoaling of fish etc. Supernatural causes were related to omens, performance of pujas, evil eye, punishment of gods, sin, bad fate, etc.

Natural reasons for cyclones as observed by the fisherfolk were concentration of clouds, air pressure, strong winds and rough sea, sea spray etc. while the supernatural reasons were **similar** as in the case of good and poor catch.

Table 4 : Traditional Caste Occupation vs. Variety of Fishing Craft and Gear

Type of Fishing Craft/Gear operated	Traditional Caste Occupation	Fishing (n=71)	Non-fishing (n=55)
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Castnet		23 (21%)	14 (1%)
Longl i ne		7 (7%)	1 (0.1 %)
Estuarine gear, total :		70 (65%)	55 (4%)
Gear, total		107 (99%)	1318 (100%)

Table 5 : Reasons for Good and poor Catch

Reasons	Traditional Caste Occupation	Fishing (n=71)	Non- fishing (n=55)
Natural reasons		47 (66%)	24 (44 %)
Supernatural causes		24 (34 %)	29 (53 %)
Indifferent		-	2 (4%)
Total		71 (100%)	55 (101%)

Table 6 : Causes of Cyclones

Causes	Traditional Caste Occupation	Fishing (n=71)	Non- fishing (n=55)
1. Natural cause		52 (73%)	24 (44%)
2. Supernatural cause		11 (16%)	5 (9%)
3. Indifferent		8 (11%)	26 (47%)
Total		71 (100%)	55 (100%)

Both tables show that realistic explanations citing natural causes are given more frequently by respondents whose traditional caste occupation is fishing.

This finding suggests that a longer association with sea fishing leads to a more realistic perception of nature. Similarly, marine fisherfolk by caste have a clearer view of the future of their trade while non-traditional fisherfolk are more often indifferent.

This is shown in the following table, where the answers have been categorized as pessimistic, optimistic and indifferent views.

Table 7 : Perception of Future of Trade

Perception	Traditional Caste Occupation	Fishing (n=71)	Non- fishing (n=55)
1. Optimistic		25 (35%)	6 (11%)
2. Pessimistic		40 (56%)	17 (31 %)
3. Indifferent		6 (9 %)	32 (58 %)
Total		71 (100%)	55 (100%)

While almost half of the non-traditional fisherfolk have no opinion, more than 90% of the traditional fisherfolk respondents express a view. As a result, the percentage of the pessimistic as well as the percentage of the optimistic respondents is greater in the group of traditional fisherfolk than in the group of non-traditional fisherfolk, where the number of indifferent responses is greater.

In both groups the pessimistic views dominate. According to the fisherfolk, with increased exploitation of fish resources the amount of catch is decreasing and hence the future cannot be assured in terms of fish production.

5.3 Child Socialization

The economic and occupational status of parents as well as their attitudes and perceptions usually determine to a considerable extent how their children are socialized. This is to be expected even more if the family is at the same time a production unit and the area of socialization is the initiation of children into various types of work and responsibilities to be carried out in co-operation with other family members.

We shall now examine whether the differences between the traditional and the non-traditional fisherfolk in their occupational and economic status, as well as their perceptions of nature and trade are reflected by the ways their children are initiated into the various duties and responsibilities related to their family occupation (fishing, marketing / processing), internal household work (cooking, cleaning, washing, child care, tailoring, management of family finance), external household work (firewood collection, water carrying, shopping), and subsidiary occupations (animal keeping, gardening).

Table 8 shows the responses of the 126 fisherfolk households selected from 6 villages in North Orissa, to the question whether a girl or a boy is usually initiated into these activities and' at what age.

In the traditional fisherfolk families the average age at which children are initiated into work is usually lower than in the fisherfolk families with other traditional caste occupations, e.g. agriculturists, artisans, etc. While in families belonging to-the latter group, girls are not at all initiated into fish marketing and processing, this work is very common among girls of the traditional fisherfolk families. According to the responses, the girls are engaged in fish marketing and processing three times as often as their brothers.

A similar picture emerges for other outdoor activities such as animal keeping, shopping, and firewood collection, 'into which girls of the traditional fisherfolk families are more often initiated than girls of the non-traditional fisherfolk families. The reason might be that, in families of agriculturists, village artisans, etc., women traditionally have to stay in the house or close to the house,

Table 8 : Initiation into Work vs. Traditional Caste Occupation

Sex/Age	Traditional Caste Occupation			Traditional Fisherfolk (n=71)		Non-traditional Fisherfolk (n=55)		
	Female child	Male child	No response	Average age of initiation into work	Female child	No response	Average age of initiation into work	
Fishing	-	71	-	13	-	53	2	12.1
Marketing/processing	33	11	27	9.4	-	33	22	13.4
Management of family finance	-	66	5	14.25	-	53	2	19.6
Cooking	71	-	-	10.5	44	-	11	11.42
Washing, cleaning	70	1	-	10.1	41	-	14	11.08
Child care	69	2	-	10.9	47	3	5	12.68
Tailoring	8	-	63	12.75	2s	-	27	20.00
Water carrying	70	1	-	9.5	4s	-	7	10.42
Firewood collection	69	-	2	9.2	30	12	13	12.72
Shopping	11	52	8	9.55	3	41	11	11.94
Gardening	1	30	40	10.45	13	15	27	12.42
Animal keeping	50	1	20	11-15	14	17	24	12.00

while among fisherfolk, this tradition has been partly abandoned because of the special situation, where fishermen have to spend a considerable amount of time away from their home out at sea, and the women have to do a number of outdoor activities. That is why the average age of initiation into work-except fishing itself-is lower among the traditional fisherfolk than among the non-traditional fisherfolk.

On the other hand, children are more often initiated into gardening and tailoring in fisherfolk families, which originally belonged to the agriculturist or artisan castes.

The findings suggest that the traditional caste occupations of artisanal marine fisherfolk in North Orissa still have a considerable influence on the socialization of their children.

5.4 Religious Practices and Rituals

While there are still distinct differences in occupational and economic status, perception of nature and child education between those whose traditional caste occupation is fishing and those whose fathers or forefathers had traditionally followed other occupations, the question arises, whether this is also the case with religious practices and rituals. In the following paragraphs traditional and non-traditional fisherfolk are compared regarding two aspects of religious culture, namely religious practices and rituals related to the fishing operation itself, and rituals for children.

5.4.1 Religious Practices and Rituals related to Fishing

Artisanal marine fishing in North Orissa is embedded in a variety of religious beliefs and traditions. Its supernatural and symbolic idealistic significance is met by a number of religious practices and rituals, which are performed by the fisherfolk, to inaugurate a new boat, to pacify the sea, to bless boats and nets, to ensure a good catch and a safe return, etc. The object of rituals and practices is either the boat, the sea and the net or deities that are related to the sea, the boat, and the net, or the goddesses and gods of the greater Hindu tradition, **and** of the lesser Hindu tradition, as well as village or household deities.

Among the deities related to the sea, the boat and the net, 'Gangamata', the goddess of the sea, is the one most commonly worshipped. River deities such as Brahmani and Dhmrai are also of considerable significance, even though limited to a certain region. For instance, these two deities belong to the estuaries and coastal areas close to the mouths of the rivers Dhamra and Brahmani. 'Kasthabudi' is generally worshipped as the goddess of the boat and 'Varuna' as the god of the winds. Very frequently it was found **during** the study, that boats, nets and the sea were personified and worshipped by the fisherfolk.

Gods and goddesses of the greater Hindu tradition, who are worshipped by the fisher-folk of North Orissa in the context of fishing operations are 'Kali', worshipped particularly by fisherfolk of Bengali origin, 'Satyanarayana', 'Gayatree', 'Jowar', besides household, village and local deities and goddesses and gods of the little tradition. In the case of goddesses and gods related to the sea and the boat as well as in the case of 'Kali', a small idol of the deity is usually installed in the bow of the boat.

It was observed during the study that while details of rituals and practices as well as objects of worship sometimes differ from village to village and region to region, a common pattern prevails.

The main occasions for the performance of the acts of worship are the beginning of a fishing trip, the full moon and new moon days (corresponding to high tides and the first fishing trip with a newly constructed boat) apart from rituals related to boat building.

A general practice of worship among the marine fisherfolk of North Orissa, as observed during the study, is to burn incense sticks or ghee threads while sailing to the fishing ground. Others offer daily fruits, flowers or just prayers to the boats or their goddess or god before setting out to sea.

Another daily practice, of 'Kali' worshippers in particular, and also of those who worship 'Gangamata,' is the splashing or sprinkling of the 'holy' Ganges water on the bow of the boat, A variation of this custom is that the fishermen, before setting out to sea, take a bath in the morning and ritually offer water to the bow of the boat with their hands. Once a fortnight, on new moon and

full moon days, a puja is usually performed, during which coconut, sun-dried rice, milk, bananas, vermilion, fruits, flowers, sandalwood paste or liquid, and cinnabar are offered to the boat or the deity. Some fisherfolk also offer the boat goddess 'Kasthabudi' or 'Kali' a new saree on this occasion, by fixing a red or blue piece of cloth to the bow of their boat.

This practice is also followed on the first fishing trip with a newly constructed boat as well as in the last month of the old year ('Chaitra Sankranti').

In the following table, rituals and religious practices have been classified into three groups according to the object of worship, viz. practices related exclusively to boat, sea, net, or to respective goddesses and gods, practices involving also other deities, besides those mentioned above, and practices involving exclusively other deities than those related to boat, net and sea.

Traditional and non-traditional fisherfolk are compared with regard to the three categories, in order to see whether fisherfolk with other traditional caste occupations than fishing have already assimilated religious practices related to their new environment to the same extent as the traditional fisherfolk.

Table 9 : Religious Practices and Rituals vs. Traditional Caste Occupation

Religious Practice	Traditional vs. non-traditional Fisher folk	Traditional Fisherfolk (n=71)	Non-traditional Fisherfolk (n=55)
Exclusively related to sea, boat, net		46 (65 %)	39 (71%)
Not related to sea, boat, net		4 (6%)	6 (11%)
Both		21 (30%)	10 (18%)

The table shows that the religious practices of the non-traditional fisherfolk relate exclusively to fishing to an even larger extent than those of the traditional fisherfolk. This circumstance, which is surprising at the first glance, can be interpreted as a sign of cultural overassimilation, which is the result of taking up a new occupation that is more dangerous and more hazardous in nature than the traditional caste occupation. Considerable spiritual and religious assurance is required and it is obtained by performing a large number of offerings to the sea and the boat in order to pacify the sea and ensure a safe return.

5.4.2 Rituals for Children

Five different types of rituals for children are generally observed among the fisherfolk of North Orissa.

‘Sasthipuja’, ‘Punchuati’ or ‘Uthiary’ are performed on the 6th or 7th day after the birth of a child. Even though the exact contents of the rituals differ from caste to caste, from village to village and sometimes even from family to family, the general pattern as observed is that Sasthi, the goddess of the children, is worshipped and invoked to bless the child. After anointing herself with turmeric and oil, the mother of the child takes a purificatory bath in a pond so that she can take up household work again. The child is also bathed for the first time. In some cases the horoscope of the child is prepared by an astrologer, and a name is given to the child,

The second type of child ritual is represented by ‘Sivapuja’, ‘Ekoisa’ and ‘Namakaran’ which are performed on the 21st day after the birth of the child. On these **occasions** ‘Siva’, ‘Jaladevi’, ‘Gangamata’, ‘Sasthi’ as well as village deities are worshipped for the sake of a prosperous and bright future for the child. A name is given to the child and the horoscope is prepared if it has not already been done during the rituals performed on the 6th or 7th day after the birth of the child.

Six to seven months after the birth of the child, the third type of ritual called ‘Annaprāsana’ is performed. On this occasion the child is given solid food for the first time. The shaving ceremony is another type of ritual. On this occasion of ‘Chudakarma’, the

head of the child is shaved for the first time and village deities are worshipped.

The fifth and last type of child ritual performed by fisherfolk in North Orissa includes the birthday of a child as well as 'Prathamastami', which concerns only the first-born child and is celebrated in the month of December. On both occasions the child is given new clothes.

The following table numerically relates the observance of each ritual with the traditional and non-traditional fisherfolk households.

Table 10 : Rituals for Children vs. Traditional Caste occupation¹

Ritual	Traditional vs. Non-traditional Fisherfolk	Traditional Fisherfolk (n=71)	Non-traditional Fisherfolk (n=55)
Sasthipuja			
Punchuati	6th or 7th day	11 (15%)	28 (51 %)
Uthiary			
Sivapuja			
Ekoisa	21 st day	42 (59%)	11 (20%)
Namakaran			
Annaprasana	6th or 7th month	14 (20 %)	14 (26%)
Chudakarma		1(2%)	5 (9%)
Prathamastami/ birthday	1st year	2 (3%)	4(7%

Characteristic differences between the traditional and the non-traditional fisherfolk are :

Comparing the rituals performed on the 6th or 7th day after the birth of a child with the rituals performed on the 21st day, we find that traditional fisherfolk emphasize clearly the latter while non-traditional fisherfolk emphasize the former.

1. The numbers in the columns do not add up to the total number of respondents because some families do not perform rituals at all while others perform several rituals.

Moreover, as far as the contents of the rituals are concerned, traditional fisherfolk worship more often 'Jaladevi' and 'Gangamata', both goddesses of the sea, so that the new born child may not face any difficulties later on, while fishing in the sea, whereas in the case of non-traditional fishermen, 'Sasthi' is usually worshipped for the general well-being of the child.

Even though the table does not show much difference between traditional and non-traditional fisherfolk with regard to performance of Annaprasana, the contents of the ritual differs. In the case of traditional fisherfolk, fish is given in many cases as the first solid food to the child and also offered to the gods.

Other rituals such as Chudakarma and Prathamastami, are less frequently performed by traditional than by non-traditional fisherfolk.

All in all, the findings show that the child rituals of artisanal marine fisherfolk in North Orissa reflect their traditional caste occupation.

5.5 Summary

Artisanal marine fisherfolk whose traditional caste occupation is fishing differ from artisanal marine fisherfolk with other traditional caste occupations with regard to all the aspects that have been studied, even though the latter, too, have been fishing for one to three generations. Compared to their counterparts traditional fisherfolk spend more time on fishing and less on secondary occupations.

They operate more seaworthy boats with larger amounts of gear in the open sea while non-caste fisherfolk operate less seaworthy craft with smaller amounts of gear and are more confined to river mouths and estuarine waters, While fisherfolk by caste show a distribution of economic **status** which is congruent with the operational pattern of the fishing technology, non-caste fisherfolk participate in fishing more frequently by contribution of assets.

Because of their longer association with the marine environment, traditional fisherfolk have a more realistic perception of nature than fisherfolk with other traditional caste occupations.

Similarly, by virtue of their longer association with fishing, traditional marine fisherfolk seem to have a more definite view of the future of their trade than do artisanal marine fisherfolk with traditional caste occupations other than fishing.

With regard to the education of their children, traditional fisherfolk families initiate girls into fish marketing and processing and also in outdoor activities such as shopping, firewood collection and animal keeping, while in fisherfolk families with traditional caste occupations other than fishing such as agriculturists and artisans, girls are restricted to activities in or close to the house. The greater role of women in traditional fisher-folk families as well as the generally lower age at which children are initiated into work can be ascribed to the regular absence of fishermen from their homes which is not the case with farmer and artisan families.

The performance of rituals for children in the non-traditional fisherfolk families differ from that in the families of traditional fisherfolk, where deities related to sea, boat, wind etc. play a more important role.

As to the rituals that are performed before or while going out for fishing, non-traditional fisherfolk worship the sea, boat and net and their deities more often than traditional fisherfolk. This phenomenon can be interpreted as an element of overassimilation to the fisherfolk culture in order to compensate for the insecurity caused by a new and potentially threatening environment, which is why most of the rituals include prayers for a safe return from the sea.

R E F E R E N C E S

1. Adams, B.N.
1980. The Family : A Sociological Interpretation. 3rd Edition. Chicago, U.S.A. : Rand MC Nally College Publishing Company.
2. Agarwala, B.R.
1955. In a mobile commercial community. Sociological Bulletin. Vol 4 (2) : 141-42
3. Antony Raja, B.
1980. Current knowledge of fisheries resources in the shelf area of the Bay of Bengal. Madras, India : FAO/SIDA Bay of Bengal Programme. BOBP/WP/8.
4. Arunachalam, M.
1909. Tamizh Illakiyavaralaru. Volume II. Mayuram, Tanjore : Gandhi Vidhyalayam.
5. Bhattacharya, G.S.
1957. The fisherfolk of Orissa. PP 44-4.5. In March of India.
6. FAO/SIDA Bay of Bengal Programme
1980. Role of Women in Small Scale Fisheries of the Bay of Bengal. Madras, India : FAO/SIDA Bay of Bengal Programme. BOBP/REP/4.
7. Brandt, A.
1972. Fish catching methods of the world. London : Fishing News Books.
8. Christensen, J.B.
1977. Motor Power and Woman Power : Technological and Economic Change among the Fanti Fishermen of Ghana. PP 85-92. In Those who live from the sea. Edited by M. Estelle Smith. San Francisco : West Publishing Co.
9. Central Marine Fisheries Research Institute
1982. Trends in Marine Fish Production in India-1981. Marine Fisheries Information Service No. 41.

10. Desai, P.
1950. The joint family in India : an analysis. Sociological Bulletin. Vol 5 (2) : 147-48.
11. Drewes, E.
1982. Three Fishing Villages in Tamil Nadu : A Socio-economic study. Madras, India : FAO/SIDA Bay of Bengal Programme. BOBP/WP/14.
12. Fairbridge, Ed.
1966. The Encyclopaedia of Oceanography. PP 110-118. Encyclopaedia of Earth Science Series. Vol. 1. New York : Van Nostrand Reinhold Co.
13. Firth, R.
1966. Malay fishermen : their peasant economy. Edition 2 London : Kegan Paul, Trench, Trubner & Co.
14. Gupta, K.G.
1970. Report of the results of enquiry into the fisheries of Bengal and into fishery matters in Europe and America. Calcutta : West Bengal Directorate of Fisheries,
15. Harris, C.C.
1970. The family : an introduction. London
16. Kalavathy, M.H. and U. Tietze.
1984. Techno-demographic Census of the Artisanal Fisheries of Orissa. Madras, India : FAO/SIDA Bay of Bengal Programme. BOBP/WP/29.
17. Karve, I.
1953. Kinship Organization in India. Poona : Deccan College. Deccan College Monograph Series 11.
18. Kolenda, P.
1968. Religion, Caste and Family Structure : A comparative Study of the Indian Joint Family. In Structure and Change of Indian Society, edited by M. Singer and B. S. Cohn. Chicago : Aldine Pub. Co.

19. Leslie, G.R.
1982. The family in social context. 5th edition, New York: Oxford University Press.
20. Mathur, P.R.G.
1978. The Mappila Fisherfolk of Kerala : A Study in inter-relationship between Habitat, Technology, Economy, Society and Culture. Trivandrum : Kerala Historical Society.
21. Norr, K.L.F.
1972. A South Indian Fishing Village in Comparative Perspective. Ph.D. thesis, University of Michigan, Ann Arbor, Michigan.
22. O'Malley, L.S.S.
1975. India's social heritage. London.
23. Pollnack, R.B.
1978. Sociocultural Aspects of Technological Change among the Small Scale Fishermen, Kingston : University of Rhode Island, Social Anthropology Dept., Anthropology Working Paper No. 22.
24. Punekar, V.B.
1959. Son Kolis of Bombay. Bombay : Popular Book Depot.
25. Ray, Manmohan
1902. some notes on the Rajvansi caste. Journal of Asiatic Society, Bengal Vol. 71. pt 3 : 50-61.
26. Raychaudhuri, B.
1969. Some fishing communities of West Bengal. Man in India. Vol 49 (3) : 241-248.
27. Raychaudhuri, B.
1980. The Moon and the Net. Calcutta : Anthropological Survey of India. Memoir No. 40.
28. Risley, H.H.
1981. Kaibarta, Kaibarta Das, Chasi Das. In Tribes and Castes of Bengal. Vol 1 pp. 375-382.

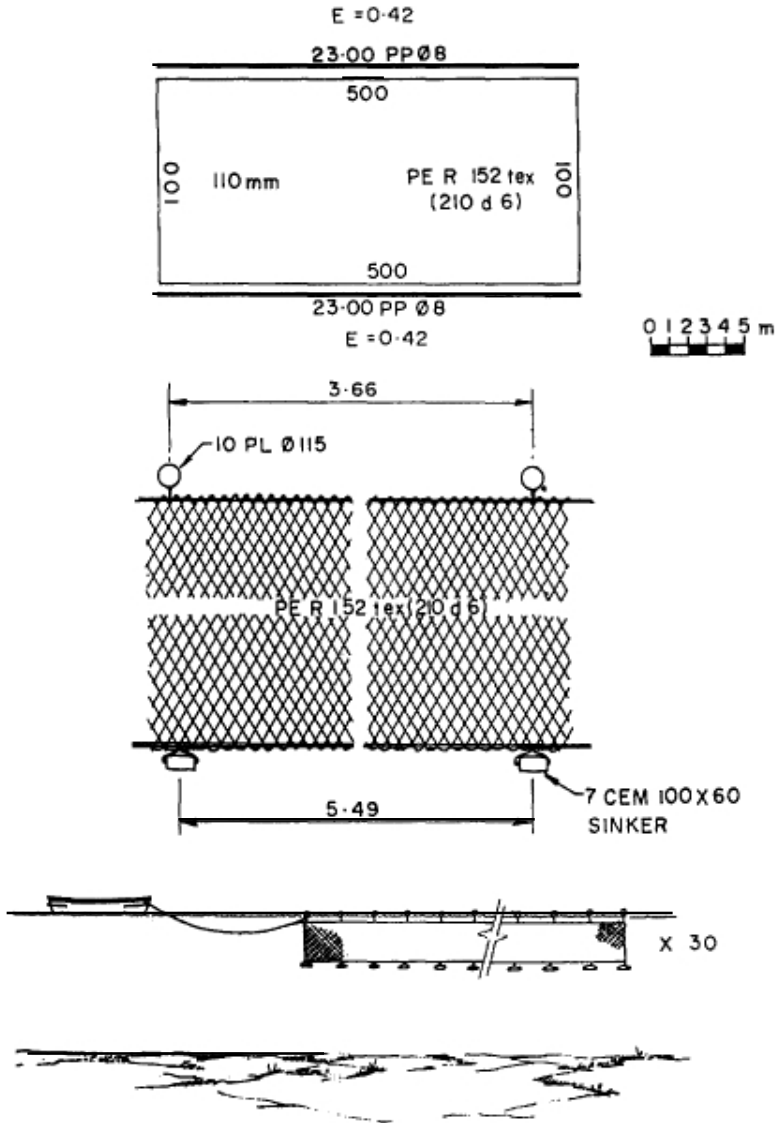
29. Ross, A.D.
1973. The Hindu family in its urban setting. Delhi
30. Russel, R.V. and Hiralal
1916. Kaibatta (Kewat). In The Tribes and Castes of the Central Province of India. Vol 1. p 370 : Vol III, p 422.
31. Suryanarayana, M.
1977. Marine tisherfolk of north-east coastal Andhra Pradesh. Calcutta : Anthropological Survey of India. Memior Nc.47.
32. Thompson, W.H.
1923. Chasi Kaibarta (Mahisya). In Census of India 1921. Vol 5 : Bengal. Pt 1. New Delhi : Registrar General of India.
33. Thurston, E.
1909. Castes and Tribes of South India. Volume II and VII. Madras : Government Press.
34. Venkatasamy Nattar
1927. Thirvilaiyardarpuranam by Paranjothimunivar. Thirunelveli : Thenindiya Saiva Siddanta Noorpudhippu Kazhagam.

ANNEXURES

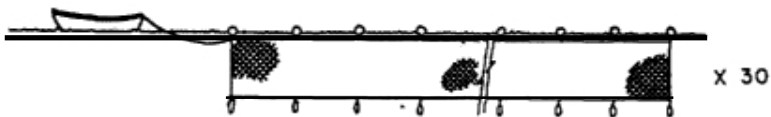
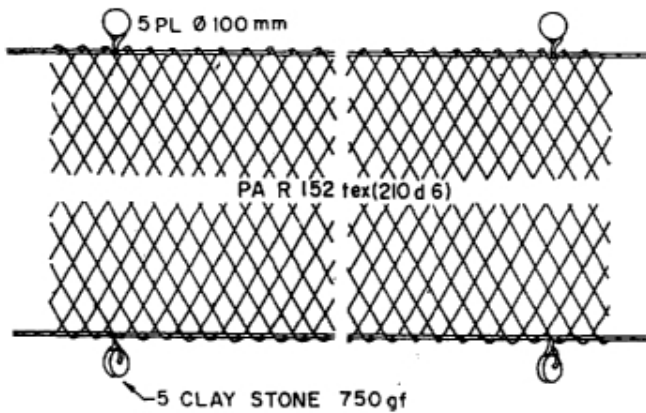
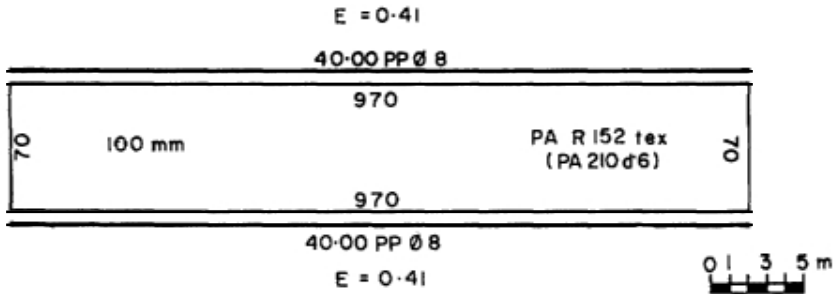
2. Design of Artisanal Marine Fishing Gear*

* The following designs refer to samples of fishing gear as observed during the study. Specifications may vary from location to location as is generally the case with artisanal production technology. This applies to fishing craft too shown under annexure 3.

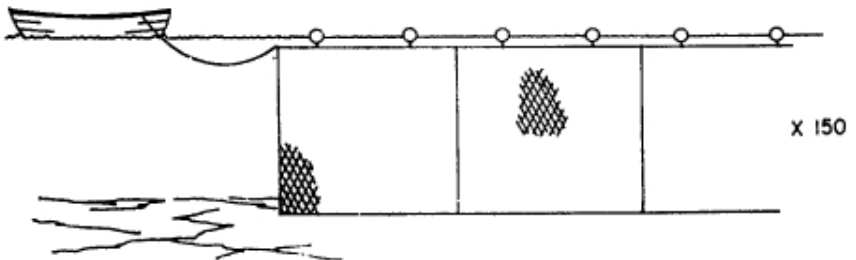
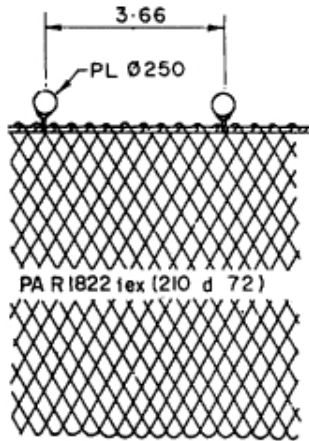
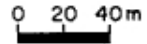
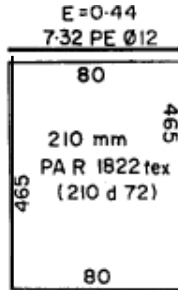
2.1 DESIGN OF SHAD DRIFTNET(PHASI JALO)



2.2 DESIGN OF SHAD DRIFTNET(ILISHI JALO)

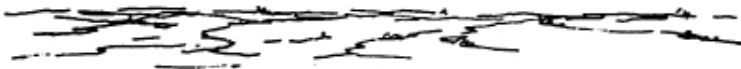
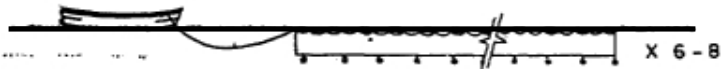
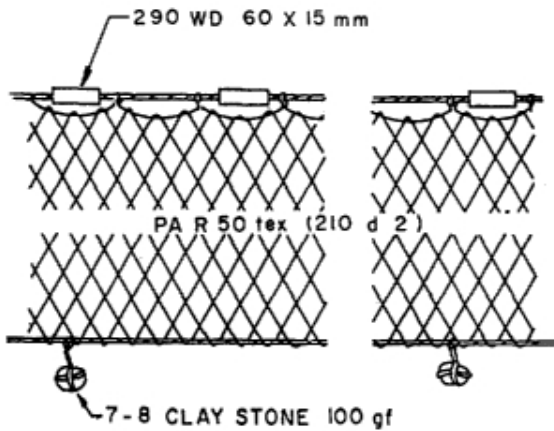
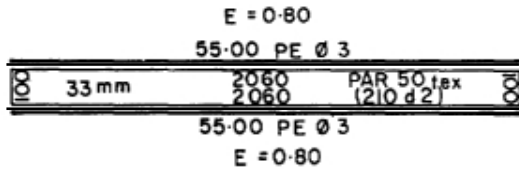


2.3 DESIGN OF LARGE MESHED SHALLOW WATER GILLNET (NAKUDA-JALO)

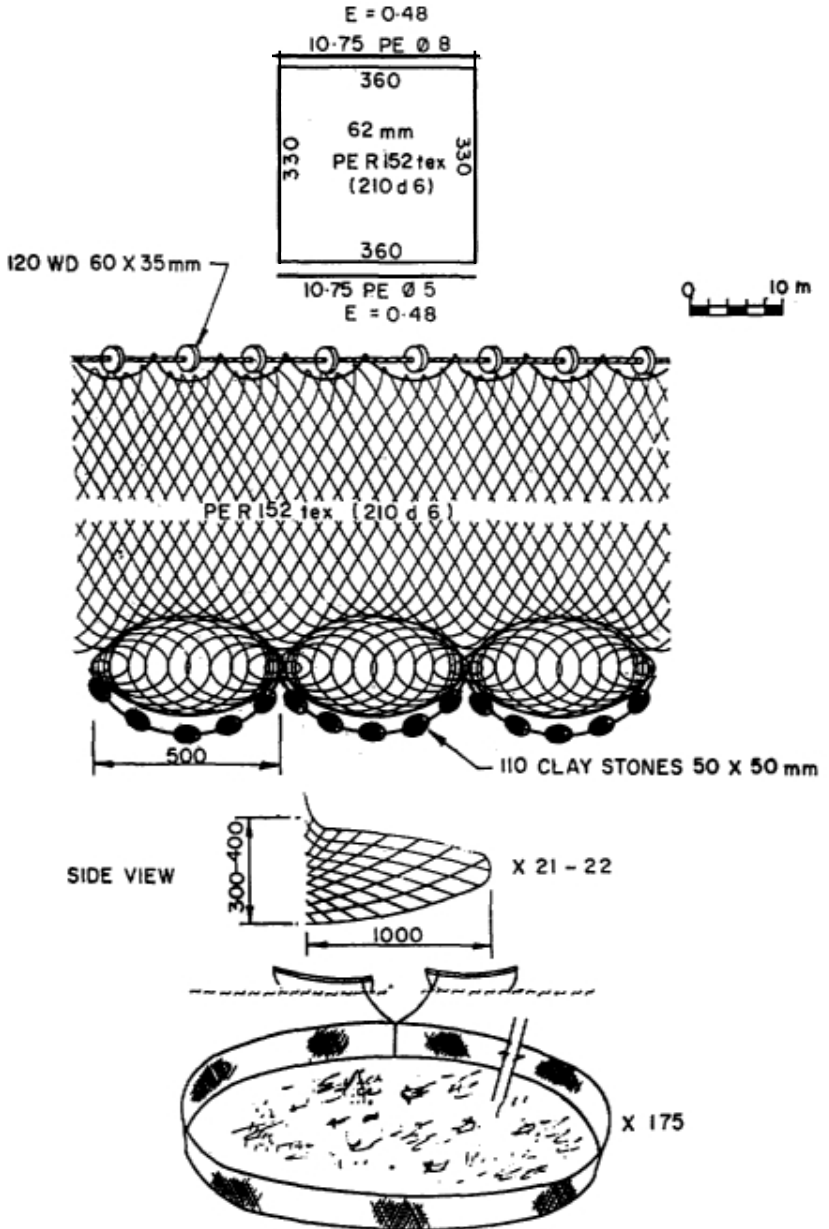


Artisanal Marine Fishing Gear

2.4 DESIGN OF SMALL MESH GILLNET (BHASANI JALO)

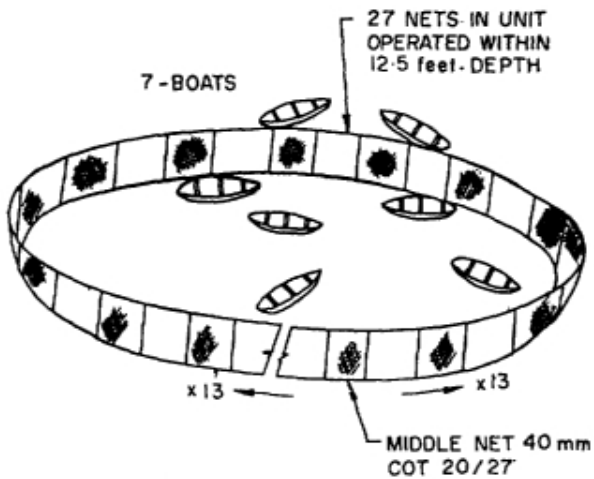
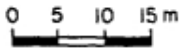
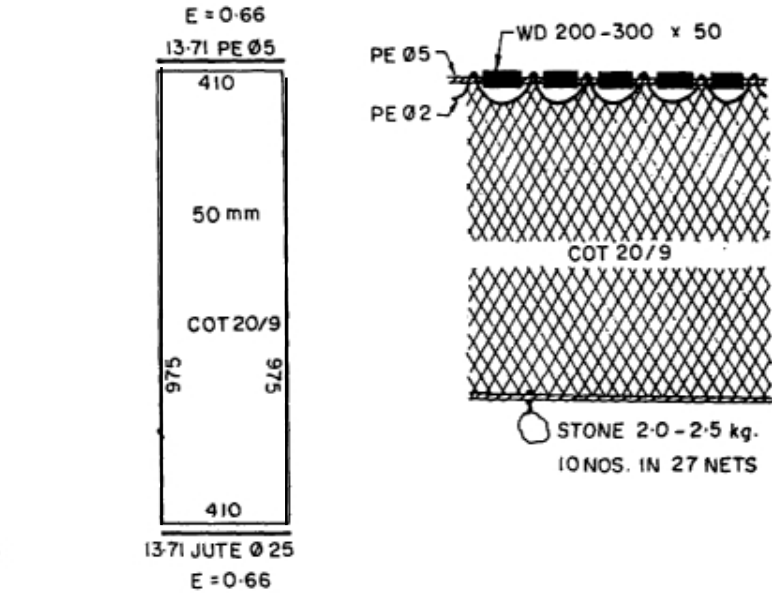


2.5.DESIGNOF ENCIRCLING GILLNET (JANGAL JALO)

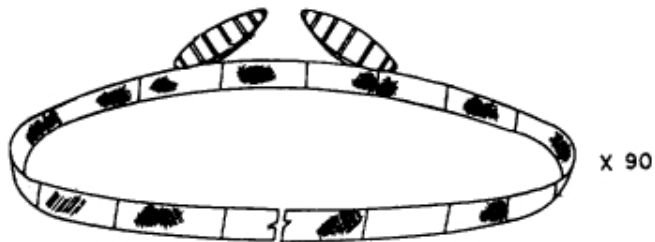
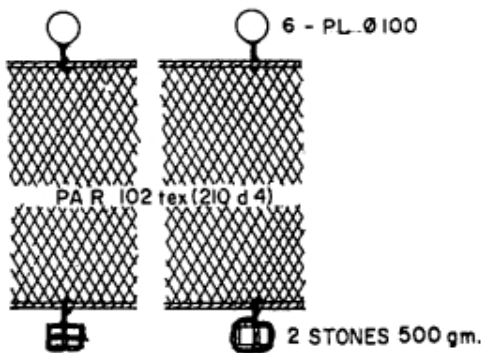
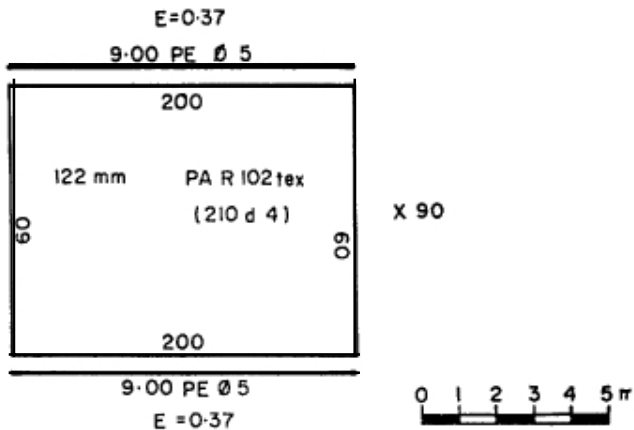


2.6 DESIGN OF AN INSHORE ENCIRCLING NET

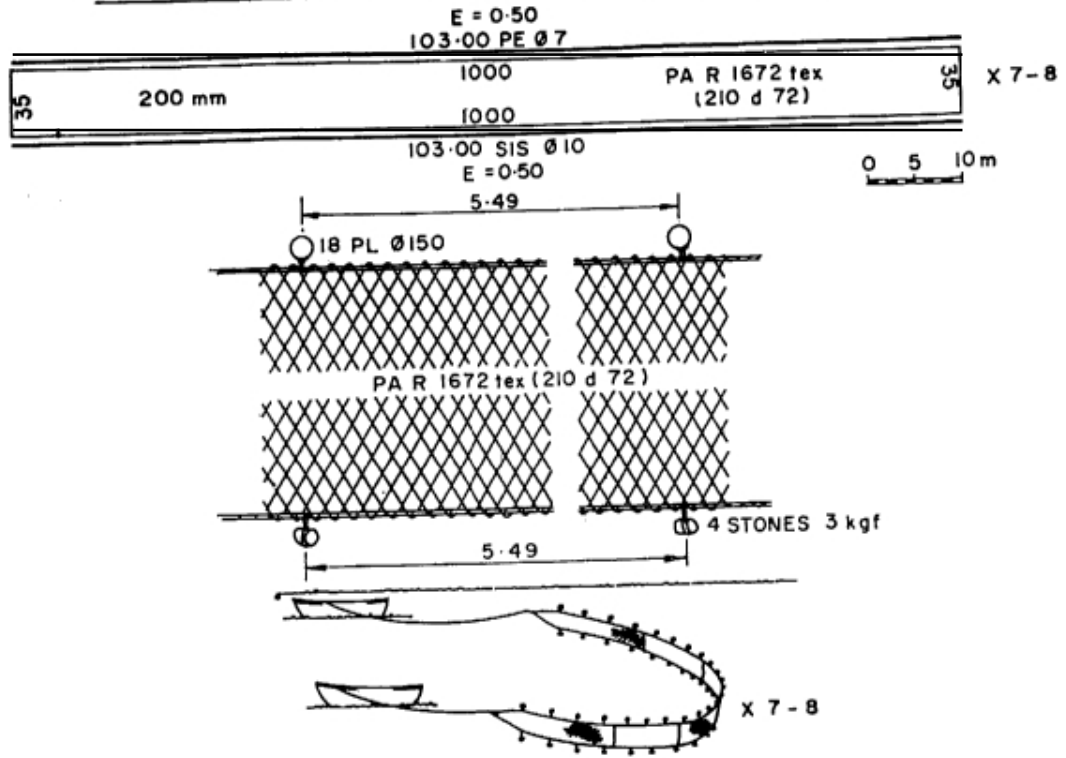
(SABADO JALO)

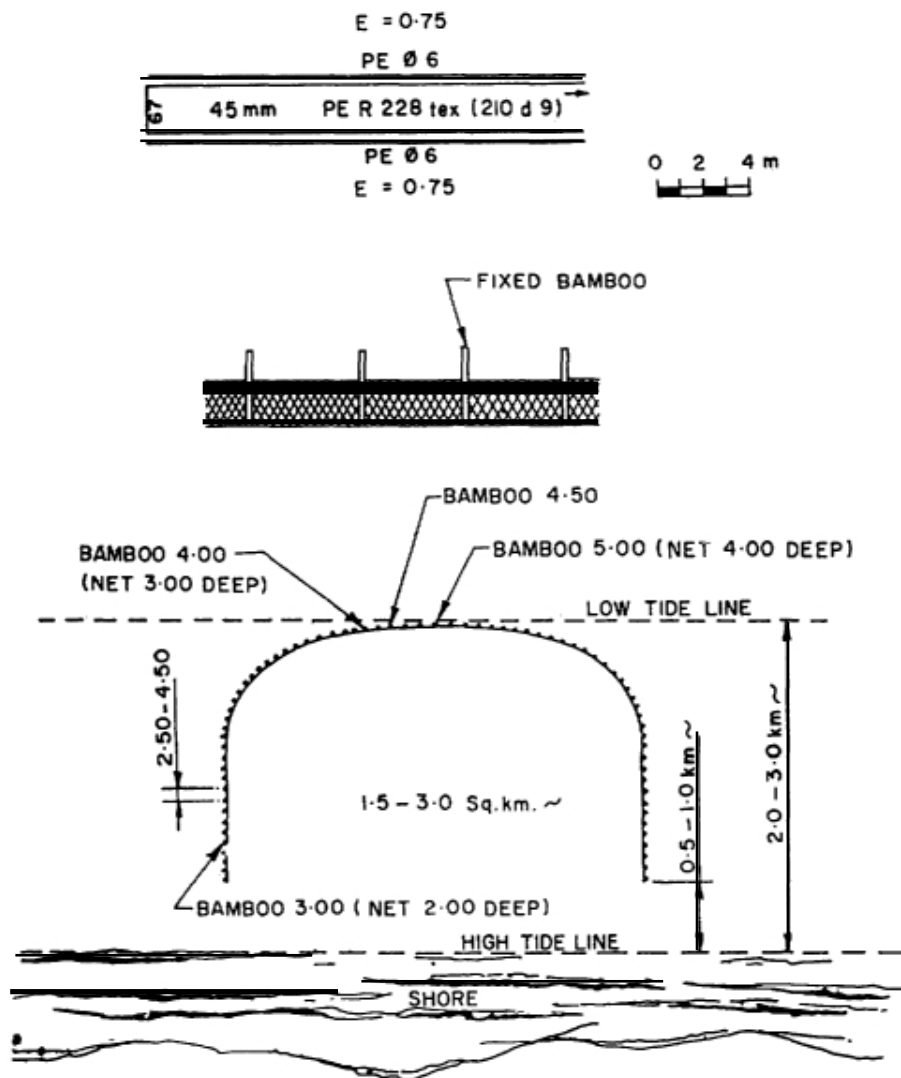


2.7 DESIGN OF SURROUNDING GILLNET 'KHIA BADIA JALO

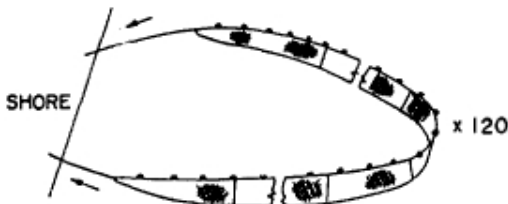
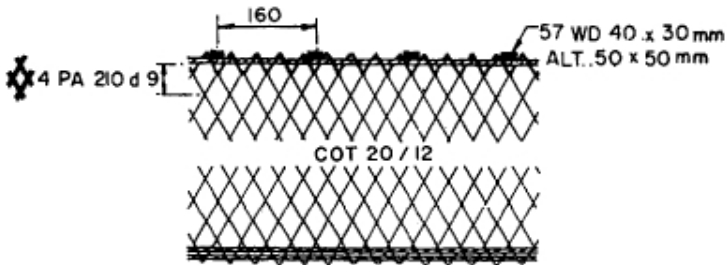
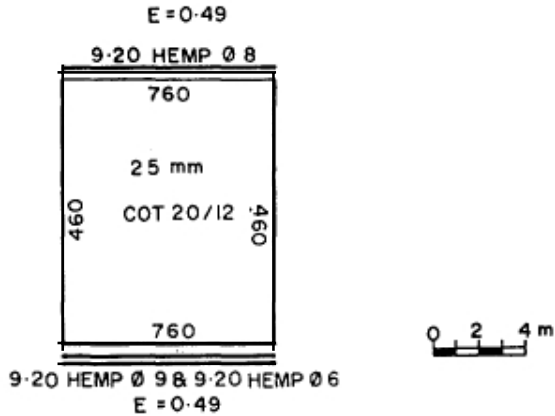


2.8 DESIGN OF SURROUNDING GILLNET (GHERI JALO)



2.9 DESIGN OF MALO JALO, TIDAL WALL NET

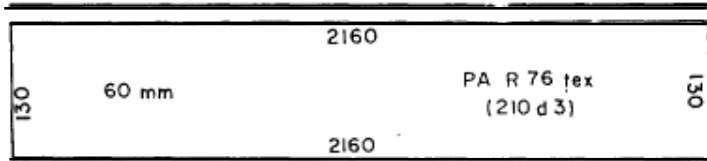
2.10 DESIGN OF SHORE SEINE FOR SARDINE
(SARINI JALO-USED IN NORTH BALASORE)



2.11 DESIGN OF DEtP BOTTOM DRIFTNET FOR SHRIMP (JAGAWALA)

$E = 0.42$

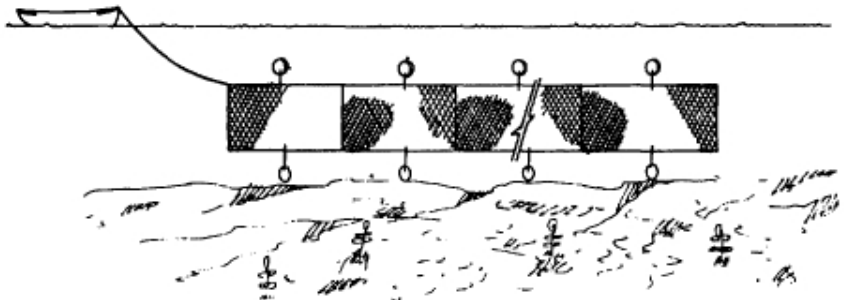
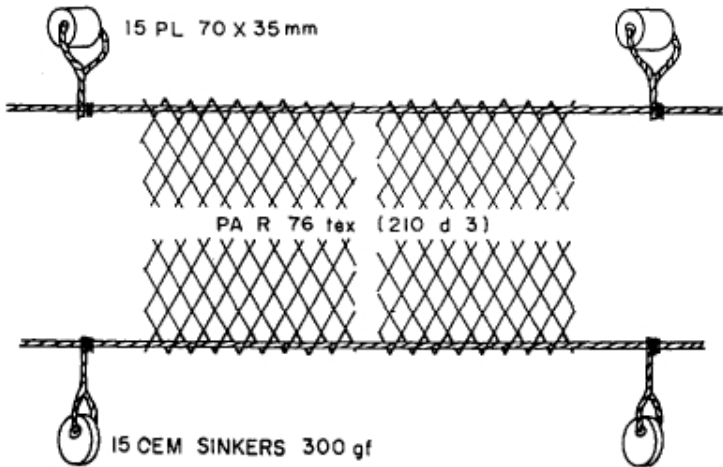
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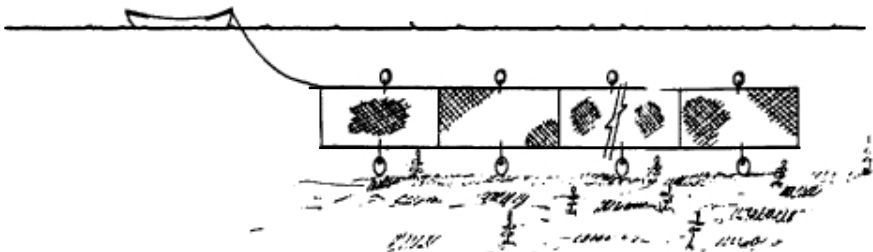
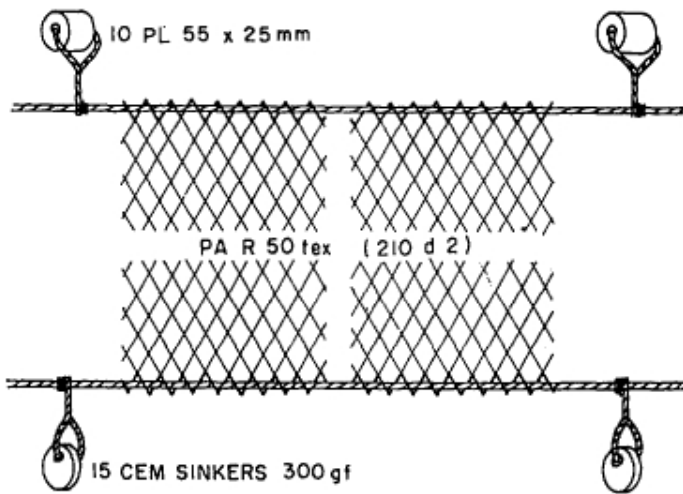
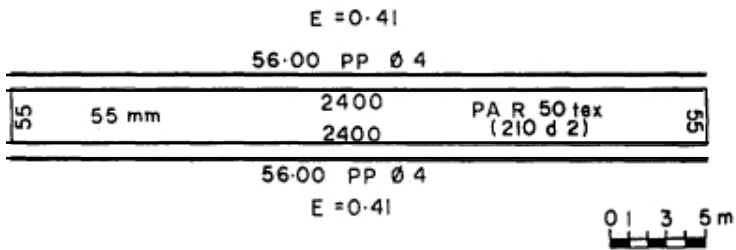
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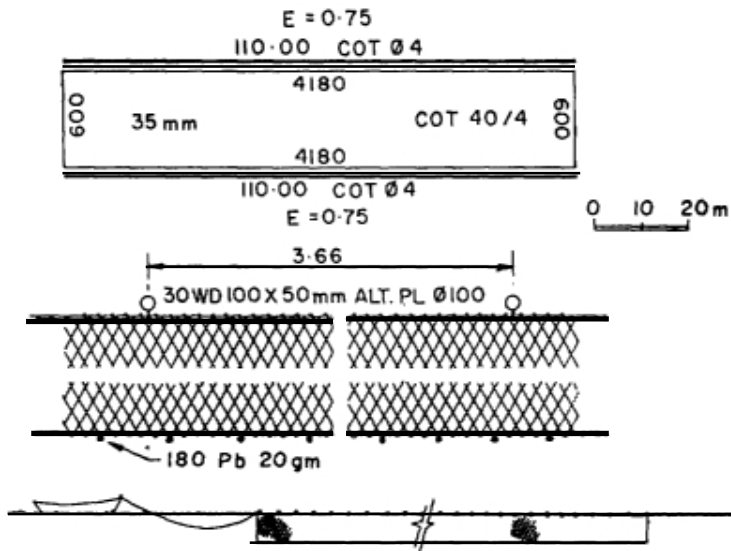
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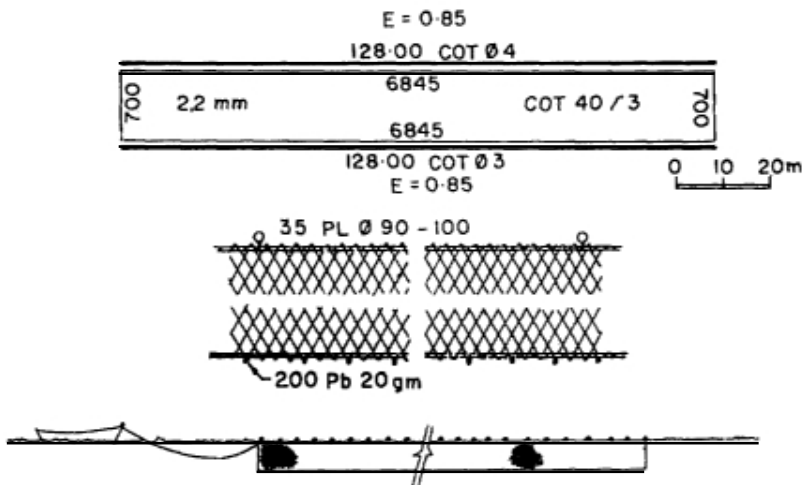
.12 DESIGN OF BOTTOM DRIFTNET FOR SHRIMP (KILUMALA)

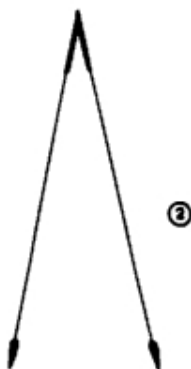
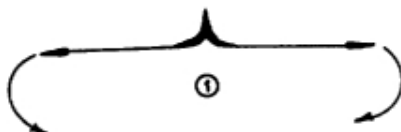
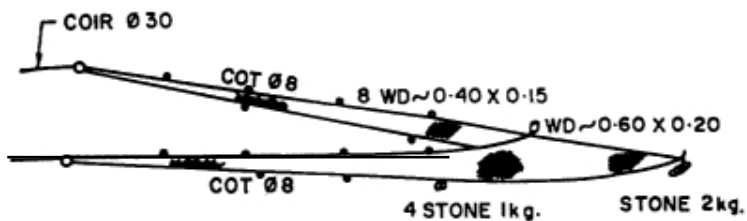


2.13 DESIGN OF SARDINE GILLNET(KATLALA)

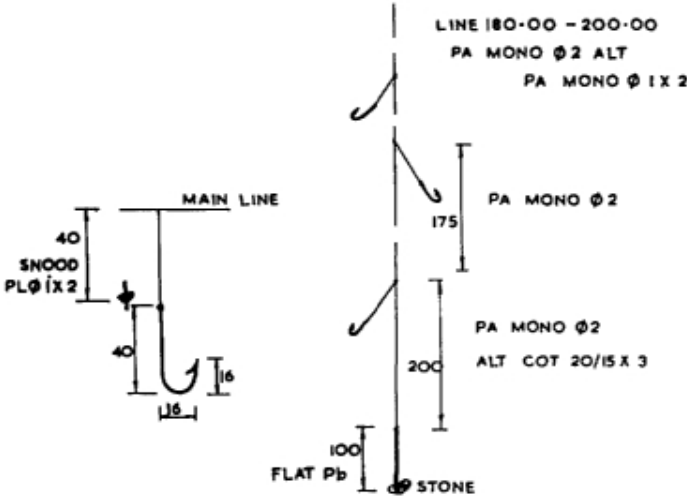


2.14 DESIGN OF ANCHOVY GILLNET (KATLALA)

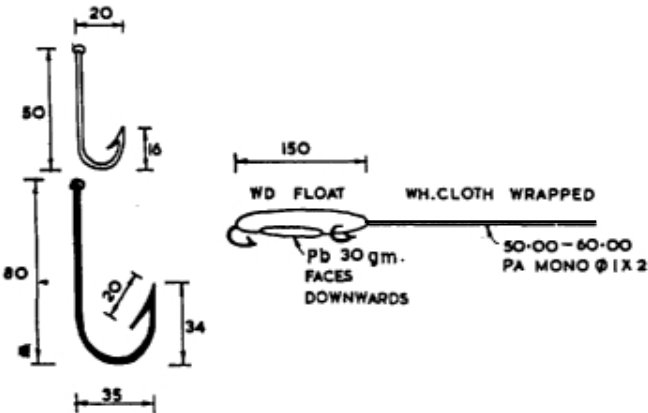


2.16 DESIGN OF A BOAT SIENE 'IRGALI

2.19 A LEAD-WEIGHT HAND LINE 'BURDU'



2.20 SURFACE HAND LINE WITH LURE 'KATA'



3 Designs of Artisanal Marine Fishing Craft

3.1 DISPLACEMENT CRAFTS OF NORTH ORISSA

3.1.1 Chhoat

Wood material	:	Shorea robusta, sal
LOA range	:	10 to 11m
Dimensions	:	10.4m x 2.41m x 1.51m
Construction	:	Carvel, raked more aft
Planking	:	35 mm, 12 each side of keel, keel 35 mm deep
Fender	:	30 mm x 50 mm deep
Frames	:	16, 50 x 80mm deep
Floor timbers	:	16, 55mm x 80mm deep, each 50mm in front of frames, stepping back between 8th and 9th plank
Thwarts	:	5, 160mm x 50mm thick, ends slotted through planking
Decks	:	Fore deck 800mm from stem, deck planking 25mm with 110mm x 40mm deep beam below. Aft deck 2.26m from stern deck, planking similar to foredeck. Space between 4th and aft deck covered as temporary removable decks.
Sheer and Bilge clamps	:	Sheer clamp 20mm x 85mm deep. Bilge stringer 20mm x 5 mm deep, 500mm below sheer clamp
Mooring bits and thole pins	:	4th frame extended 360mm above sheer as mooring bit, 760mm x 50mm thick thole pins 190mm above sheer, 2 on either side

Rowing oars	:	Blade 900mm x 140mm x 25mm, bamboo shaft 3.66m x 50mm dia
Steering oars	:	Blade 2.30m x 150mm x 50mm, shaft 4m x 180mm
Mast	:	8.6m x 200mm dia, wood
Preservation	:	Coal tar
Sail	:	Rectangular cloth, 6.4m X 6m

3.1.2 Patia

Wood material	:	Shorea robusta, sal
LOA Range	:	8.5m to 10.5m
Dimensions	:	8.95m x 1.81m x 1.32m
Construction	:	Clinker, chine type, stem and stern nearly vertical
Planking	:	23 mm, 4 upper nearly vertical on 130mm to 140mm width, 12 lower from chine decreasing to 35mm width at lowest. Plank overlaps by 60 to 70mm, 2 top upper planks, carvel inside. Keel 25mm deep, 40mm in middle, width 100mm
Frames	:	3, natural crook, 85mm x 120mm deep from 4th to 12th lower planks. Two below 6th and 7th thwarts supported by 3 vertical pieces.
Thwarts	:	9, 70mm to 115mm wide x 25mm to 50mm thick, excepting ninth 270mm wide
Thole pins and mooring bits	:	Thole pins 4 on each side, 80mm x 80mm protruding 250mm above sheer. One mooring bit 100mm x 80mm and 200mm above sheer
Rowing oars	:	Blade 2.2m x 130mm x 25mm, convex on one side, bamboo shaft 3.60mx50mm dia
Steering oar	:	Blade 2.20m x 150mm x 50mm, shaft 3.80m x 175mm dia

Mast	: 8m x 200mm dia
Preservation	: Coal tar
Sail	: Rectangular cloth 6.4m x 6m

3.1.3 Dhi ngy

Wood material	Shorea robusta, sal
LOA Range	6m to 7m
Dimension	: 6.5m x 1.63m x 0.97m
Construction	: Carvel, ends close to vertical
Planking	17mm, 9 each side of keel, keel 80mm wide, 80mm deep decreasing to 20mm at sides
Gunwale	110mm x 30mm thick stem and stem ends as small platform
Sheer clamp	: 120mm deep x 20mm thick
Frames	: 16, 60mm x 60 to 80mm deep
Floor timbers	: 14, 65mm x 70mm, adjoin lower ends of frames to 15
Thwarts	5, 100m to 175mm wide x 25mm to 35mm thick, excepting 3rd, 230mm wide with mast hole
Thole pins	2 on either side 15mm above sheer
Rowing oars	Blade 1.01m x 200mm X 10mm, shaft 4m to 4.5m x 160mm dia
Steering oar	: Blade 780mm x 210mm x 10mm, shaft 4.5m x 45mm dia
Mast	: 4.57m x 50mm dia
Preservation	: Coal tar
Sail	: Rectangular cloth 6.4m x 5.9m, bamboo for hoisting 6.4m x 30mm dia

3.1.4 Danga

Wood material	Shorea robusta, sal
---------------	---------------------

LOA Range	:	7.5m to 9m
Dimensions	:	8.3m x 1.91m x 1.26m
Construction	:	Clinker, chine type, near vertical stem and stern, maximum beam forward of midship
Planking	:	25mm, 5 upper 100--190mm wide, nearly vertical upto chine, 9 lower from chine decreasing to 30 mm at lowest. Planks overlap by 60-70mm. Keel 150mm wide, 25mm deep and 45 mm in middle.
Fender	:	25mm x 25mm
Frames	:	2 below 5th and 6th thwarts, sawn dog-leg shape, 80mm x 135mm deep, fixed. from 3rd lower plank
Thwarts	:	8, fixed below sheer 116mm-140mm wide x 30mm deep, first and eight are smaller and larger respectively. Thwarts protrude outside planking
Thole pins and mooring	:	4 pins on either side 200mm above sheer and extending upto one plank below chine. 1 mooring bit 250mm from sheer on port side
Rowing oars	:	Blade 750mm x 120mm x 25mm convex on one side, shaft 2.75m x 50mm dia
Steering oar	:	Blade 750mm x 150mm x 37mm, shaft 2.75m x 160mm dia
Mast	:	7m x 200mm dia bamboo
Preservation	:	Coal tar
Sail	:	Rectangular cloth 5.5m x 5m, sides reinforced with 4 to 6 mm dia PA rope

3.1.5 Salti

Wood material	:	Shorea robusta, sal
LOA Range	:	7m to 10m

Dimensions	:	9.78m x 2.08m x 1m
Construction	:	Carvel, ends extended and raised
Planking	:	25mm, 10 on each side 130-140mm deep. Keel 100mm wide, 25mm thick, 60mm in middle
Wash strake	:	150mm above gunwale
Fender and sheer clamp	:	15mm x 50mm on both sides of wash strake and planking
Frames	:	19, 50mm x 50mm, from 1st to 7th plank
Floor timbers	:	19, 50mm x 65mm thick, 80mm at centre, adjoin fare-edge of frames. Stepping block between 7th and 8th timbers.
Thwarts	:	9, 130-140mm x 25mm thick, excepting no. 4: 170mm x 60mm with mast hole
Decks	:	Fore deck 1.07m from stem with transverse support, aft deck 1.95m from stern with similar support
Thole pins and mooring	:	200mm above sheer, 4 on either side, abaft pair for mooring
Rowing oars	:	6, one piece wood 2.96m long x 68mm thick x 175mm wide but 75 mm at upper end, shaft 100mm dia extends 1m beyond blade
Steering oar	:	One piece wood, 3m long x 75mm thick x 225 mm wide
Mast	:	5.19m length x 90mm dia bamboo
Preservation	:	Coal tar
Sail	:	4. 1m top x 4m bottom x 5.09m luff x 2.8m leech, sides reinforced with 6mm PA rope; corners with extra 8mm PA rope

3.1.6 Sabado

Wood material	:	Shorea robusta, sal
LOA Range	:	9.75m to 13.5m
Dimensions	:	13.41m x 2.41m x 0.97m
Construction	:	Carvel. aft end more extended and raised than abaft
Planking	:	67mm, 15 each side of keel, keel 200mm wide, 67mm thick, 75mm in middle
Fender and sheer clamp	:	2.25mm x 75mm
Frames	:	16, 62mm x 62mm, from 1st to 10th plank
Floor timbers	:	16, 62mm x 75mm thick, 100mm at centre, adjoin fore-edge of frames. Stepping block between 6th and 7th timbers.
Thwarts	:	15, 130-150mm x 30mm thick
Thole pins and mooring	:	200mm above sheer, 4 on either side, abaft pair for mooring
Rowing oars	:	6, one piece wood, 3.20m x 70mm thick x 200mm width but 75mm at upper end, shaft 120mm dia bamboo, extends 1m beyond blade
Steering oar	:	One piece wood, 3.50m x 75mm thick and 250 mm wide
Mast	:	5.75m x 160mm dia bamboo
Preservation	:	Coal tar
Sail	:	4.5m top x 4.3m bottom x 5.5m luff x 3m leech, sides reinforced with 6mm PA rope; corners with extra 8mm PA rope

3.1.7 Flat bottom Danga

Wood material	:	Shorea robusta, sal
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LOA Range	:	10m to-11m
Dimensions	:	10.67m x 1.05m x 1.07m
Construction	:	Clinker, flat stem and stern, latter more extended
Planking	:	25mm, 3 side planks, 200mm-290mm vertical, 4 bottom planks, 137mm-250mm at right angles. Keel plank 100mm thick.
Fender	:	20mm x 20mm
Thwarts	:	8, 200mm x 40-50mm thick, below gunwale ends slotted through planking. Each thwart supported by 2 vertical pieces above floor timber and another transverse piece. Also 2 additional transverse pieces below thwart level.
Gunwale	:	125mm wide x 60mm deep, forms platform at aft
Thole pins	:	4 to 6 places on both sides
Rowing oar	:	Blade 1.60m x 130mm x 50mm thick in middle and 12mm at sides. Shaft 1.70m x 68mm dia
Steering oar	:	Blade 1.30m x 350mm x 30mm thick. Shaft 3.20m x 350mm dia
Mast	:	5m x 200m dia
Sail	:	Thick cloth, rectangular 4m x 3m

3.1.8 South Balasore Danga

Wood material	:	Shorea robusta, sal
LOA Range	:	9m to 10m
Dimensions	:	9.45m x 2.03m x 0.75m
Construction	:	Carvel
Planking	:	33mm , keel 75mm x 75mm
Frames	:	13, 40-45mm

Floor timbers	:	12, 40mm x 100mm deep, 50mm behind frames
<i>Gunwale</i>	:	275mm fixed with sawn frames 550mm x 75mm x 50mm thick, low deck
Wash strake	:	200mm above planking
Other particulars	:	Thole pins, mooring bits
Sail	:	Triangular
Mast	:	5.19m x 90mm dia bamboo

3.1.9 North Cuttack Dhingy

Wood material	:	Shorea robusta, sal
LOA Range	:	6m to 7m
Dimensions	:	6.85m x 1.54m x 0.48m
Construction	:	Carvel
Planking	:	25mm, 6 on either side, 150mm deep, keel : 90 mm width
Fender	:	25mm x 25m
Frames	:	9 , 50mm x 37mm deep
Floor timbers	:	7, 50mm x 37mm deep, thicker in middle
Thwarts	:	9 , 300-400mm x 30mm, hole for mast in no. 4
Decks	:	Fore deck, aft deck
Wash strake	:	150mm above sheer
Bilge clamp	:	18mm X 75mm deep
Sail	:	Triangular, 7m x 5m x 5m

3.2 LOG RAFTS, BAR BOATS AND NAVAS OF THE SOUTH

3.2.1 2 Section Boat Kattumaram or Teppa (four logs)

Wood material	:	Albizzia Stipulata
LOA Range	:	6m to 8.5m

Dimensions	:	8.3m x 1.5m x 0.54m
Construction	:	Each half has 2 logs, one thicker inner, one outer. A vertical wash strake is attached which is 30mm thick x 90mm high. Rockered bottom. Depth of inner log 540mm at midlength. 100mm at fore end and 260mm at aft, breadth of inner log 1. 1m, maximum near midship. Both halves firmly lashed. Cross pieces at times. Mast joint aft of forward lashing.
Rowing oars	:	2.5m x 90mm x 50mm, 30mm at sides
Steering oar	:	Slightly larger
Mast	:	8m x 75mm dia bamboo, beam 4.2m x 50mm dia
Sail	:	Triangular 7.5m luff x 6m x 6.25m. 7mm dia PA rope, reinforcement at sides.

3.2.2 3 Log Kattumaram

Wood material	:	Erythryna Indica (alt Albizzia Stipulata)
LOA Range	:	4.2m to 5m
Dimensions	:	4.2 x 0.76m x 0.42m
Construction	:	Two outer and one larger median log. Median 0.26m breadth:, 0.3m depth. at midlength (sometimes 2 to 3 pieces pegged together). Outer logs (each 3 pieces pegged) 0.25m breadth, peripheral piece being higher and curved to give line of sheer, log pieces lashed firmly, aft and abaft with sub-hemp ropes. Accessory stern pieces optional and not given when log fore ends are normally extended and raised. No wash strake.

Rowing oars	:	1.7m x 70mm (40 mm at the edges) x 25mm thick
Steering oars	:	Slightly larger
Mast	:	4m x 30mm dia bamboo
Sail	:	Triangular 4m luff x 2.8m lower angular side. 5mm dia PA rope reinforcement at sides

3.2.3 4 **Log** Kattumaram

Wood material	:	Erythryna Indica (alt Albizzia Stipulata)
LOA Range	:	4.5m to 5.5m
Dimensions	:	4.8m x 0.75m x 0.40m
Construction	:	Two outer and two inner logs. Each in the particular craft made up of 6 pieces pegged together (mostly used pieces from old craft). Pegged pieces usually fewer in newer crafts. Inner logs 4.65m x 0.14m wide x 0.34m deep at midlength, fore and aft less deep. Sheer of log at ends 0.4m. Outer logs 4.8m, fore end curved to make a slightly sharp-topped stem, depth 0.47m, log width in middle 0.23m. Wash strake piece 90mm high x 50mm broad pegged to outer log. Logs firmly lashed at both ends (in some accessory stem pieces fixed). Aft end square.
Rowing oars	:	1.8m x 70mm (35mm at the edges) x 25mm thick
Steering oar	:	Slightly larger
Mast	:	4.5m X 35mm dia bamboo
Sail	:	Triangular 4.5m luff x 3m at Lower angular side. 5 mm dia PA rope reinforcement at sides.

3.2.4 Barboat/Padhua

Wood material	:	Mangi fera India
LOA Range	:	7m to 8.3m
Dimensions	:	7.42m x 2.2m x 1.14m
Construction	:	Non rigid without frames. All planks and wooden pieces served by coir ropes with straw packing.
Planking	:	25mm, 2 on each side (or 3), wooden gunwale piece 60mm x 60mm at sheer, upper plank 110 mm deep, lower widest 0.72m to 0.87m. Planks well, curved fore and aft to give required hull shape and joined at edges to stem and stern pieces. Lower edges of 2nd plank (or 3rd where present) are stitched to outer edge of outer bottom plank.
Bottom	:	Nearly flat, 1.5m broad amidship, formed of 2 planks on either side of keel wood, narrowing fore and aft ending near the junction of the bottom keel pieces to the corresponding stem and stern pieces. Keel formed of 3 wooden pieces from bow to stem, the round 150mm bottom keel pieces and the two others bent.
Thwarts		6.,1m to 2.2m, the 4th largest
Deck	:	Platform 1.8m from aft. Another 600 mm x 210mm x 25mm piece behind stem
Rowing oars	:	3. shaft 3.65m to 4.75m, blades 0.09 to 0.14 sq.m. area. 3 oar pegs 500mm, 250mm above sheer

Mast	:	2.55m length x 70mm dia with accessory wood
Preservation	:	Coal tar, with a further coating of white/coloured varnish
Sail	:	Triangular, 8.26m x 5.6m x 4.9m (with boom 8.26m)
Variation	:	Bar boat type used at Paradeep Port (procured from Andhra Pradesh) are generally smaller with less beam and depth, but have more side planks

3.2.5 Nava

Wood material	:	Teak
LOA Range	:	8.5m to 10.1m
Dimensions	:	8.7m x 1.92m x 0.92m
Construction	:	Carvel, rockered bottom
Planking	:	25mm, 6 on each side, 140-160mm deep, upper close to vertical, keel 100mm wide, 40mm thick, 25mm at edges
Stem and stern	:	Stem nearly straight for 330mm, thin curved for 340mm. Stem 60mm x 100 mm. Stern block length 500mm, upper side with hole for tiller, 440mm deep. Breadth 240mm at top and 50mm below.
Frames	:	25, 70mm x 90mm deep, each made up of 5 portions, side portions from gunwale to chine or turn of bilge, next lower portions behind, at the bilges and centre portions fixed abaft
Clamp	:	200mm x 25mm thick, longitudinal

Thwart	:	5, 0.2m to 0.27m wide x 40mm to 50mm thick. Mast hole in 2nd thwart. Stepping block between frames 10 and 11.
Decks	:	Aft deck from stern to frame 21. Fore-deck from stem to frame 3.
Rowing oars	:	3.8m with triangular blade
Steering oar	:	5.5m with blade
Mast	:	5.5 x 125mm dia, wooden
Preservation	:	Coal tar
Sail	:	Triangular 8m x 7m x 7m

Artisanal Marine Fisheries in India : an Annotated Bibliography

By V. **BHAVANI**

1 Social Organization

1.1. Anthropological Studies

Andhra Pradesh

RAZEQ, K.A.: Marine fisherfolk of Andhra : a preliminary exploration. pp 46-54. In Research Programme on cultural anthropology and allied disciplines, edited by S.C. Sinha. Calcutta : Anthropological Survey of India, 1970.

Presents the basic information on the technology, social organization and economy of the fishing communities of Andhra Pradesh (Vada Balija and Jalari) gathered during the exploratory field studies as a preliminary survey under the Programme of Research on the coastal fisherfolk of Andhra Pradesh.

The survey was carried out in the districts of Srikakulam and Visakhapatnam during 1967.

Gujarat

HAJRA, D. : Marine fisherfolk of Gujarata : preliminary exploration pp 55-81. In Research Programme on cultural anthropology and allied disciplines, edited by S.C. Sinha. Calcutta : Anthropological Survey of India 1970.

Presents the basic information on the technology, social organization and economy of the fishing communities of Gujarat (Kharwa, Koli or Moyal and Machbira) gathered during the exploratory field studies as a preliminary survey under the Programme of Research on the coastal fisherfolk of Gujarat.

The investigation was carried out in the Veraval Coast of Junagadh district of Gujarat.

Kerala

MATHUR, P.R.G. : Mappila fisherfolk of Kerala : a study in inter-relationship between habitat, technology, economy, society and culture, Trivandrum : Kerala Historical Society, 1978.

Presents a description of the fishing organization, technology, kinship structure, socio-religious institutions and-rituals and belief-systems, especially those associated with fishing activities among the Mappila fisherfolk of Malabar who inhabit the coastal region of the Ma lappuram district of Kerala. Part 1 discusses their knowledge of oceanography, fishing grounds, habitat and behaviour of fishes, and climatic conditions such as wave, current, lunar and tidal influences On catches etc. Part 2 deals with their technology-fishing craft, fishing gear and methods, technology and socialization and the attempts made in technology change. Part 3 studies their economic organization-ownership of assets, labour and credit, and trade and marketing. Part 4 is on the rituals and supernatural beliefs of the community.

Maharashtra

PUNEKAR, V.B. : The Son Kolis of Bombay. Bombay : Popular Book Depot, 1959.

The socio-cultural study of Son Kolis, a fishing community inhabiting the Bombay region covers the following aspects-social organization of Son Kolis and its sub-groups; their life at home and daily routine; the social/religious customs and rites related to birth, marriage and death ; training and education of children; knowledge and tradition of the Son Kolis; kinship pattern ; religious practices; occupational pattern and economy.

TRIVEDI, R.K. : Sutrapada fishing hamlet, Junagadh district, Patan Veraval taluk, New Delhi : Registrar General of India, 1964. (Census of India 1961, Vol 5. pt 6. Village survey monograph series ; 9).

Studies the socio-cultural and socio-economic structure of the fishing community, Kharva-Ghogalia Kharva, Vanakiya Kharva and Koil Kharva-settled in the Sutrapada village after their migration from the former Portuguese enclave of Diu. Presents a brief physical description of the village followed by a description of the people-the social structure, housing pattern, dress, ornaments, beliefs and practices connected with birth, marriage and death. Next section discusses their economic activity-fishing operations, fishing assets, cooperatives, income, expenditure, indebtedness etc. This is followed by a description of their social and cultural life-family structure, religious institutions and practices festivals and celebrations, leisure and recreation, village organization and castepanchayat. The text is supplemented with tables and illustrations.

Orissa

AHMED, M. : A monograph on village Nuagolabandh, Berhampur sub-division, Ganjam district. New Delhi : Registrar General of India, 1962. (Census of India 1961. Vol. 12. pt 6 : Orissa. Village survey monograph series ; 5)

A study of the socio-cultural structure of Nolias, a fishing community dominating the village Nuagolabandh. Gives a physical description of the village, followed by a description of the people-their religion, caste and community structure, size and composition of households, house types, ornaments etc. Next section discusses their economy- fishing practices, occupational mobility, income, expenditure, indebtedness, marketing facilities and village organization. This is followed by a presentation of their social and cultural life-birth and puberty rites, marital status, marriage and death customs, literacy and education, religious institutions, beliefs and practices, community festivals, leisure and recreation. The text is supplemented with tables, sketches; and photographs.

KALAVATHY, M.H. Artisanal marine fisheries of Orissa : a
and TIETZE, U. : technodemographic study. Madras BOBP,
1985 (BOBP/ WP/29,)

This paper describes the methodology and results of a census of marine fishing villages in the four coastal districts of Orissa. The paper describes the states' marine-resources and the infrastructure in the four coastal districts. It discusses the **assets** owned by the fisherfolk and assesses the balance between labour, craft and gear-a balanced relationship means that all capacities are utilized to the maximum.

RAYCHAUDHURI, B. : The fishing communities of Chilka : a study in their ecosystem. **J. Indian Anthropol. Soc.** 12 ; 1977 : pp 101-112

Analyses how the caste system among the fishing communities of Chilka lake region operates in relation to its total ecosystem. (See also entry under West Bengal-Mukherjee, B.)

Tamilnadu

KAUFFMANN, S.B. : A Christian caste in Hindu society : religious leadership and social conflict among the Paravas of Southern Tdmilnadu. **Modern Asian Studies** 1981.

The study of the Paravas, the marine fishing community of South India, describes the operation of caste and Christian identity in Colonial South India, and the relationship between the institutions of economics and religion.

MOSES, S. C. : The Valayans of Pamban. **Man in India**; 1929: pp 149-156.

A socio-cultural study of the Valayan community of the Pamban area. The following aspects are studied-settlement and housing, characteristics of the community, their social status, religious institutions and practices, customs relating to marriage and death, food habits.

West Bengal

MUKHERJEE, B. : Comparative study of the fisherfolk : coastal West Bengal and Orissa. In Research Programmes on Cultural Anthropology and Allied Disciplines, edited by S. C. Sinha. Calcutta: Anthropological Survey of India, 1970. pp 32-45

Presents the basic information on the technology, social organization and economy of the fishing communities of West Bengal (Jaladas or Kaibarta, Malo, Rajbansi, Dhibar and Bagdi) and Puri (Telugu Nolias) gathered during the exploratory field studies as a preliminary survey under the Programme of Research on the coastal fisherfolk of West Bengal and Orissa.

MUKHERJEE, B. and others. : The fisherfolk of Phuleswar and their seagoing fishing organization: report of a preliminary survey. **Bull. Anthropol. Survey, India** 18 (1); 1969 pp. 45-93

The ethnography and marine fishing economy of Rajbansi, Dhibar and Bagdi communities (fishing castes) in phuleswar are presented. The following aspects are studied-social organization, marriage, panchayat and land, indebtedness, inter-caste relations, migration, working system, division of labour, socialization of children occupation, the gear, craft and fishing operation.

RAYCHAUDHURI, B. : Caste and occupational drift **J. Indian Anthropol. Soc.** 5; 1980: pp 15-21

Delineates the process, mechanism and pattern of occupational drift of the various caste groups among the marine fisherfolk of Jambudwip and Chinsura. These have been viewed in terms of the changing situation emerging from the increase in population, industrialisation and urbanisation.

RAYCHAUDHURI, B. : Fishing rituals of the marine fisherfolk of Jambudwip : a socio-cultural study. **Bull. Anthropol. Survey, India** 17 (2); 1967: pp. 83-1 10.

Studies the rituals, connected with their day-to-day occupational operations viz. with the preparation of fishing gear and craft; starting of the fishing operation; establishing their migrating settlements on the island during the fishing season, first setting of the net; the first catch; first consignment; winding up of the temporary settlement etc.

RAYCHAUDHURI, B. : Moon and Net : study of a transient community of fishermen at Jambudwip-Calcutta : Anthropological Survey of India, 1980.

A socio-cultural study of the fisherfolk of Jambudwip (island). The following aspects are studied—the establishment and general features of the temporary settlements on the island during the fishing season ; organization of the operating units (crews), fishermen's knowledge of their immediate environment; the craft, gear, fishing methods and fish handling; supernaturalism and rituals in fishing; money and marketing network ; cooperation and conflict among the crew.

RAYCHAUDHURI, B : Some fishing communities of West Bengal. **Man in India 49 (43); 1969:** pp 241-246.

Presents some basic facts about marine fishermen and fish traders in a southern district of West Bengal, mainly the Rajbansi, Dhibar, Bagdi, Malo and Kaibarta.

1.2 Socio-Economic Studies

General

KURIEN, J. : Social factors and economic organisation of the traditional small-scale fishermen of India. Paper presented at the CMFRI Seminar on the Role of Small-Scale Fisheries and Coastal Aquaculture in Integrated Rural Development, Madras, December 1978. Trivandrum : The Author, CDS, 1979.

Using **data** from several empirical studies, makes a critical analysis of the social and economic conditions of these traditional fishermen who are poor, unorganized and politically powerless. Inequality in asset distribution and the process of market exploitation are identified as the major causative factors responsible for their existing conditions. These two aspects are discussed in detail. Finally, the paper **focuses** on the fishermen's real contribution to the development of the modern fishing industry.

ROY, R. N. : Integration, application, and management of energy activities at the community level : technology transfer

and communication. In *Appropriate technology for alternative energy sources in fisheries*, edited by R. C. May and others, Manila : ICLARM and ADB, 1982. (ICLARM Conference Proceedings ; 8).

The status of the fishing economy of India in general and of the traditional fishing economy in particular is studied to identify the causative factors contributing to the predicament of fishermen. The causes are identified as inequality of asset holding and exploitation by middlemen in the market process. On this assumption in the long run the development of small fishermen would have to involve people's efforts to organize themselves to institute fundamental and institutional changes in the socio-economic system. In the short run, however, technology based on renewable energy may enable better exploitation of marine resources and improve the quality of life of the fisherfolk. Energy needs of such fishermen are studied and a case is made for the integration of appropriate technologies and renewable energy sources into the professional and domestic life-styles of those communities to enable them to improve their quality of life at less cost and with reduced use of hard energy (author's abstract).

Andhra Pradesh

AGRICULTURE FINANCE CORPORATION, Bombay : Socio-economic survey of twenty-two fishing villages in Konaseema, East Godavari District, Andhra Pradesh, Bombay : The Corporation, 1979.

Chapter 1 gives a general background i.e. physical features and infrastructure of the Konaseema area. Chapter 2 describes the methodology of the study. Chapter 3 deals with the people of the area-demography, credit structure and fishing infrastructure. Chapter 4 deals with the fishing resources and fishing practices. Chapter 5 describes the socio-economic conditions of fishermen. Chapter 6 deals with marketing. Chapter 7 discusses the problems and gives suggestions relating to the general infrastructure like health, education, transport, communication etc ; fishing ; and marketing.

ANDHRA UNIVERSITY TECHNICAL CELL : Study of fisheries development in the coastal districts of Andhra Pradesh. Waltair : Andhra University, 1978.

The study attempts to examine the socio-economic conditions of the traditional fishermen of Andhra Pradesh. The sample studied includes 350 fishing households in 7 fishing villages. The first chapter deals with the importance of fishing industry in India and Andhra Pradesh. Second chapter describes briefly the seven fishing villages surveyed. Third chapter deals with the socio-economic conditions of the sample fishing households. Chapter 4 examines the indebtedness pattern. Chapter 5 discusses the traditional craft and gear in use. Chapter 6 deals with fish catch and utilization. Also examines the variations in income from fishing. Chapter 7 attempts to identify the costs and returns of mechanized craft. Chapter 8 discusses the problems associated with fish marketing. Chapter 9 gives a brief summary of findings and a policy guideline for the overall development of the fishing industry.

HARTMANN, W. D. : Bandaravanipeta : a marine fishing village, Colombo : FAO/UNDP. Small-Scale Fisheries Promotion in South Asia, 1977 (RAS/77/ 044/WP/16).

The socio-economic aspects and problems of the fishermen community in Bandaravanipeta in northern Andhra Pradesh are studied in order to assess how these factors influence the process of change—both negatively and positively. The following factors are studied—the people (ethnic group, language, religion, caste history) ; occupational categories, income and expenditure, ownership pattern ; craft, gear, fishing seasons, production, marketing ; the social life ; politics; infrastructure facilities etc.

HARTMANN, W. D. : Mobilization and Stagnation in a Fishing Community: The Case of Bandaravanipeta, Andhra Pradesh. Madras : FAC/UNDP. Small-Scale Fisheries Promotion in South Asia, 1978 (RAS/77/044/WP/20).

Attempts to analyse the various factors that contribute to the stagnant state of efforts aimed at the socio-economic uplift of fishing

communities and involvement of fisherfolk. in the process of social transformation and social change.

VENKATARAMAN, G and ALAGARAJA, K. : Cyclones and Fisheries : aftermath of four cyclones in Andhra Pradesh during **1976-1979. Mar. Fish. Infor. Service. T &E Ser., Na. 16 ; 1980** pp 1-11.

Gives an account of the damage caused by the cyclones in the heavily affected coastal districts of Nellore, Prakasam, Guntur and Krishna ; and the relief and rehabilitation measures taken.

Gujarat

RAO, G.S. and DATTA, KK. : Cyclone devastation along Saurashtra coast of Gujarat in November **1982. Mar. Fish. Infor. Serv. T & E. Ser. No.44 ; 1982** pp 1-7.

A severe cyclonic storm hit the coastal districts of Jungadh, Amreli and Bharnagar of Saurashtra in November 1982. This paper describes the damages caused to the fishing villages and relief measures undertaken.

Karnataka

DHARMATAJA, S.K. and JACOB, T. : Impact of the introduction of commercial purse-seine operations on the traditional fisheries of the Karnataka coast in India. Rome : FAO, 1980 (IPFC/80/SYMP/EXP/1 1)

The large-scale operation of purse-seines for mackerel and sardines since 1977 along the coast of Karnataka has adversely affected the traditional Rampari fishing for the same species. The number of operations, the catch per operation and the total landings by Rampari nets have declined steadily, thus displacing a number of active fishermen. Financial assistance preparing the Rampari fishermen to buy and use purse-seiners on cooperative basis and inducing them to take up mariculture are suggested as speedy rehabilitation measures.

Kerala

RALASUBRAMANIAM, S. : Survey report of Kandakkadavu : a fishing village in Kerala state. Cochin : CIFT, 1981 Spl. Bull. **Cent. Fish. Technol. Cochin ; 10.**

The survey was undertaken in July-September 1979 at Kandakkadavu, Kerala in order to study the problems of a fishing village and its development. The human and technological resources are described and various suggestions related to the problems are presented.

GULATI, LEELA. : Profile in poverty : a study of five poor working women-Trivandrum : Centre for Development Studies, 1979 (CDS Working Paper 99)

Focuses on the lives and problems of five poor working women living in the outskirts of the city of Trivandrum, Kerala. One case study is about a fisherwoman.

GULATI, LEELA. : Women in fishing villages on the Kerala Coast : demographic and socio-economic impacts of a fisheries development project: Geneva : ILO, 1983 (Population and Labour Policies Programme. WP. 128) (Reproduction of : Fishing Technology and Women/L. Gulati-Trivandrum : Centre for Development Studies, 1983. CDS Working Paper 155)

Analyses the impact of the Indo-Norwegian Fisheries Project on the fisherwomen of the project area, namely, Neendakara, Sakthikulangara and Puthenthura villages in Kerala. Chapter 1 gives the background information of **the** project that attempted to introduce technological change and its aftermath. Chapter 2 deals with the demographic profile of Kerala state as a whole. Chapter 3 is a profile of the project villages. This is followed by 10 case studies of fisherwomen selected from these 3 villages. The concluding part discusses the broad inferences drawn from the cases in the light of the profile of the project villages as a whole. Highlights the technological,

economic and demographic changes in the project area in general, and specifically the changes in the role and status of women.

KURIEN, J. : Towards understanding of the fish economy of Kerala state : a preliminary study of the current situation and trends in organization, technology, production and distribution of income. Trivandrum : CDS, 1978. (CDS working paper 68).

Examines in detail the production activity and the essential differences in the nature of the production in the traditional and modern sectors of the fish economy, in the first chapter. Chapter 2 describes the technology, ownership patterns and spatial dispersion of the production activity in the traditional (non-mechanized) and modern sectors. Chapter 3 reviews the trends in production during 1956-1976. The production trend in the mechanized and non-mechanized sector is compared and reviewed in Chapter 4. The major conclusions of the study are summed up in the last chapter.

KURIEN, J. and WILLMANN, R. : Economics of artisanal and mechanized fisheries in Kerala. Madras : BOBP, 1982 (GCP/RAS/77/044/WP/34).

This comparative study surveyed 242 selected fishing units operating from 15 different villages along five districts of Kerala coast. Statistics of over 20000 fishing trips were collected over the Year of study. The analysis indicates that the productivity, profitability and objective contributions to the national economy by the artisanal fishing units are more significant than those of the mechanized craft. The paper tries to justify the need for greater attention and support to the artisanal sector.

KLAUSEN, A.M. : Kerala Fishermen and the Indo-Norwegian Pilot Project. Oslo : Universitetsforlaget, 1968.

It is a social anthropological analysis of the villages where the Indo-Norwegian Project has been launched. Chapter 1 briefly sketches the important aspects of the donor and receiver and the theoretical framework. Chapter 2 gives an ethnographical sketch of the whole project area. Chapter 3 is a broad description of the

Christian Fishing Community in the project area, namely Latin, Catholics. Chapter 4 is a corresponding description of the Hindu fishing population called Araya community. Chapter 5 discusses the traditional forms of organization in the fisheries in relation to the new ones which are launched by the Indo-Norwegian Project, and the reactions to the new ones. Also includes the description of stimuli and reaction outside the fishing sector such as health etc. Chapter 6 presents the actual analysis of the different reactions and Chapter 7 gives the conclusions of the study.

NOBLE, A and NARAYANAN KUTTY, V. A. : Economics of the indigenous fishing units at Cochin : a case study. Cochin : CMFRJ, 1978. (CMFRI special publication. 4)

Thanguvala (boat seine)/ayila vala (gillnet) and dugout canoes are the most popular traditional fishing units of the Cochin region, mainly operated to catch mackerel and oil sardines. This paper studies the economics of operation of the unit, using catch-effort data collected for 10 years.

PANIKKAR, K.K.P and ALAGARAJA, K. : Socio-economic status of fishermen community of Calicut area. Mar. Fish. Infor. Serv. T & E Ser. NO. 33 ; 1981 : pp I-12.

Studies the impact of introduction of meechanized boats on the socio-economic condition of traditional fishermen. The study covers the Calicut region where the Agricultural Refinance Development Corporation has supplied mechanized boats to families involving 350 fishermen. These fishermen were compared to the ones in a neighbouring village where only traditional fishing is done.

SATHJADAS, R and VENKATRAMAN. : Impact on mechanized fishing on the socio-economic conditions of the fishermen of Sakthikulangara, Neendakara, Kerala. Mar. Fish. Infor. Serv. T.& E. Ser. No. 29 ; 1981.

Studies the impact of mechanized fishing on a traditional fishing community in Kerala.

THANGAPPAN ACHART, T. R. and MENON, M.D. : A report of the assessment of the impact of the Indo-Norwegian Project on the socio-economic conditions of the fishermen of the Tndo-Norwegian Project area.

The project was implemented in Sakthikulangara and Neendakara of **Kerala** with the objective of bringing about an increase in return on the fishermen's activity ; to introduce an efficient distribution of fresh fish and improvement of fish products ; to improve the health and sanitary conditions of the fishing population ; and to raise the standard of living of the community in the project area through development of fishing craft, development of new resources, introduction of an efficient distribution of fishermen cooperatives, and establishment of health centres with free medical aid. The paper attests that there had been a positive impact on the community which can be seen from the following factors- growing importance assumed by mechanized fishing ; improvement in the general standard of living of the fisherfolk ; greater dispersion in the ownership of fishing capital ; increased export ; faster industrialisation ; and increase in employment opportunities in the area.

Orissa

VIJAYAN, A. J. : Migrant Fishermen in Paradeep, Orissa. ICSSR/FRC Study. Trivandrum : Programme for Community Organization, 1980.

Analyses the socio-economic factors related to the migrant labour force, mainly from Kerala at Paradeep in Orissa. The following aspects are studied-the history and process of migration ; the working conditions of the migrants viz., the wage systems (sharing/salary systems), income pattern, and exploitation by the boat owners; important characteristics of the skilled and the characteristics of supervisory cadre in the migrant labour force; the living conditions of other sections of migrant labour such as hoteliers, shopkeepers, tailors, mechanics etc ; the workers' organizations and the future trend envisaged in the fishery development of Orissa, specially Paradeep, and the impact on the migrant labour force.

Tamilnadu

ANUGRAHAM, D.D. : The fisherfolk of Madras : An economic survey. Thesis submitted for the Degree of Master of Letters of the University of Madras. 1940.

A study of the socio-economic conditions of the fisherfolk in the city of Madras. It covers five fishing hamlets in the city (of which one is a river-fishing kuppam) and the following aspects--ethnology of the community in the region; description of the hamlets; the fishing operation including the labour pattern; number of working days, fishing gear, season, and crafts; wage pattern, subsidiary occupation such as net making, fish curing and basket making ; economic aspects like income, indebtedness etc ; sanitation and health; housing ; village organization and administration ; production ; transport and marketing ; religious customs and practices.

BLAKE, B. A. : Technological change among the coastal marine fishermen of Madras state. M. Phil dissertation. Madison : University of Wisconsin, Anthropology Dept, 1970.

The study covers the following regions of Tamilnadu-Madras and Chingleput districts and Pulicat Lake area-trying to identify the attempts made to improve the technological proficiency and socio-economic position of the fishing communities of the project area. Also studies how effective are the agents of change in accomplishing their goals.

DREWES, E. : Three fishing villages in Tamilnadu : a socio-economic study with special reference to the role and status of women. Madras : BOBP, 1982 (BOBP/WP/14).

The study examines the socio-economic conditions of marine fisherwomen, their involvement in productive activities and the scope for new income generating activities in 3 fishing villages, viz. Peria Neelangarai, Chemman Cheri and Pattipulam, south of Madras. It also attempts to describe the organization and economics of traditional fishing communities. Chapter 1 gives the summary and

conclusion of the study. Chapter 2 details the background and methodology of the survey. Chapter 3 gives the background information and geographic locations and infrastructure facilities, population, housing, cultural and religious attitudes of the communities, political leadership, assets and their distribution in the three villages. Chapter 4 deals with the data analyses and interpretations.

NORR, K. L. F. : A South Indian fishing village in comparative perspective. Ph. D dissertation. Michigan : University of Michigan, 1972.

A fishing village closer to the southern border of Madras city has been studied to be compared with agricultural villages in India. The comparisons are made on the following aspects : the economic organisation ; changes in work organisations, mobility and the role of the family ; and the degree to which the village is integrated into the larger society.

SATHIADAS, R. Mechanization of indigenous craft with out-board motors in Tamilnadu : an impact study. Mar. Fish. Infor. Serv. T & E Ser. No.38 : pp 17-19

Studies the extent of mechanization of kattumarams in the districts of Kanyakumari and Tutunelveli of Tamilnadu.

A comparison has been made between the non-mechanized and mechanized boat operations.

SELVARAJ, C. : Small fishermen in Tamilnadu. Madras : Sangam Publishers, 1975.

Analyses the socio-economic status of small fishermen of both mechanized and non-mechanized sectors in Tamilnadu in general and the problems of marketing in particular. Also summarises the main conclusions in the areas of production, income and distribution. In addition, gives recommendation for action by the government.

SLVAKUMAR, S.S. and others. : From Toori to Thirty Footer: a preliminary study of the political economy of fishing in Tamilnadu. Madras Inst. Deve. Stud.Bull. 9 (12); December 1979: pp 582-596.

Discusses the results of a survey done in fishing kuppams around Madras. Describes the technology of traditional fishermen such as fishing methods, nature of means of production, labour and capital intensity and production relations. Also describes the changes that have occurred in technology and production related to the introduction of mechanized fishing. Considers the political economy of mechanization. Briefly analyses the ecological nuances of mechanization.

WARRIAR, K. M. : Socio-economic survey of fishermen in Madras city, Doctoral dissertation. Madras : Loyola College, Economic Research Centre, 1967.

The following aspects are studied-pattern of income and expenditure ; indebtedness and sources of credit: the marketing system; the nature of assistance offered by the cooperative societies; the nature and type of government assistance and their effect on the fisherfolk; the attitudes of fishermen towards modern techniques in fishing and their social awareness; and the major social and economic disabilities of fishermen.

I.3 Cooperatives

KURIEN, J. : Fishermen Cooperatives in Kerala : a Critique. Madras : BOBP, 1980. (BOBP/MIS/1).

Briefly analyses the history and rationale of fishermen's cooperatives in Kerala and highlights the main reasons for their failure. Presents a theory about the mode of operation of a cooperative organisation for the small fishermen of the state-particularly the selfemployed fishermen. The practical application of this theory examined in the last part, with a case study of a successful small-scale fishermen's cooperative in Trivandrum district.

NATIONAL FISHERIES COOPERATIVE CONGRESS: Souvenir, New Delhi : National Federation of Cooperative Ltd, 1982.

The souvenir includes articles on the following topics : role of fisheries cooperatives in the 6th Five-Year Plan : fisheries cooperatives in Gujarat and Bihar; role of cooperative education and training

institutions; composite development of fishery cooperatives; revitalization of cooperatives for efficient fish marketing of marine fishermen cooperatives and suggestions for accelerated development ; review of performance, problems and prospects of fishery cooperatives.

2 Economy

2.1 Production

CMFRI, Fishery Resource Assessment Division. Trends in total marine fish production in India : 1979. Mar. **Fish. Infor. Serv. T & E Ser. No. 22 ; 1980 :** pp 1-19

Statewise and specieswise data on fish production are presented. The numerical data is supplemented with bar diagrams.

CMFRI, Fishery Resources Assessment Division. Trends in total marine fish production in India : 1981. Mar. **Fish. Infor. Serv. T & E Ser. No. 41 : 1982 :** pp 1-33

Analyses the landings of oil sardines, penaeid prawns, harpodon nehercus, sciaenids, lesser sardines, ribbon fish, non-penaeid prawns, mackerel, elasmobranchs and silver bellies in the different maritime states for the year 1981. This is compared to the landings of the previous years since 1971.

DESHMIJKH, V. M. and KURIAN, A. : The Bombay Duck. **Mar. Fish. Infor. Serv. T & E Ser. No. 20;** June 1980 : pp 1-8

Bombay Duck is exploited by indigenous craft and gear, the most important gear is dol net (bag net) operated up to 40 m depth and the majority of the catch is along the coast of Maharashtra and Gujarat. This paper describes the Bombay Duck fishery-seasonal distribution, catch per haul, growth, age composition, maturation and sex composition, feeding habits, etc.

GEORGE, M. J. and SUSEELAN, G. : Changing pattern of prawn production in small-scale fisheries in India. Rome : FAO, 1980. (IPFC/80/SYMP/EXP/10).

Almost the entire production of prawns in India comes from the small-scale fisheries sector. The paper projects this by presenting the gearwise/regionwise analysis of the 1978 catch. Major gear operated are trawlnets, fixed bag nets, boat seines, shore seines and gillnets operated by both non-mechanized country craft and small mechanized craft. Concludes by emphasising the need for certain regulations for conservation and to protect the small fishermen from the trawler operators.

GEORGE, M.J, SUSEELAN, G and BALAN, K. By-catch of the shrimp fishery in India. **Mar. Fish. Infor. Serv. T & E Ser. No.28 ; 1981 : pp 1-13.**

Elasmobranchs, cat fishes, perches, sciaenids, soles, ribbon fishes, silver bellies, eels, cephalopods etc. are the by-catches of shrimp fishery. This paper reviews the statewide seasonal composition of the by-catch and their utilization. Also describes the gear and craft used in the shrimp fishery.

JACOB, T and others. : Impact on purse-seine operations OF traditional fishery with special reference to Oil Sardine in Kerala during 1980 and 1981. **Mar. Fish. Infor. Serv. T & E Ser. No.40 ; 1982 : pp 8-11.**

Presents the results of the study undertaken to examine the reasons for the decline in the landings of Oil Sardine in 1980 and to determine whether the purse seine Operations started in 1979 have any influence on the traditional fishery. The data on catch, effort, age and length composition of oil sardines for the years 1978, 1979, 1980 and 1981 pertaining to indigenous gear and purse seines and data on socio-economic aspects of the fishery in the coastal villages of Kerala are analysed.

LUTHER, G. : Anchovy fishery of Southwest Coast of India with notes on characteristics of the resources. **Indian J. Fish 26 (I & 2); 1976 : pp 23-39.**

Analyses the catch data for anchovy from eleven fishery survey zones along Cape Comorin and the northern border of Kerala Coast

during the years 1969-71. The annual landings, species composition, utilization of catch and marketing are discussed.

MANISSERI, M.K. : On the fishery of Juveniles of *Penaeus Semisulcatus* along the Tirunelveli Coast, Tamilnadu. **Indian J. Fish.** 29 (1 & 2); 1982 : pp 20-29.

Penaeus semisulcatus de Haan contributes to considerable fishery on the southeast coast of India, particularly in the Gulf of Manner. These are fished throughout the year by an indigenous gear known as 'Ola Valai' operated in the waters within 2 m depth. The peak abundance is during November-January and June-July. This paper discusses the fishing ground, craft and gear used and trends in production.

NAIR, A.K.K. and G. BALAKRISHNAN : The Bombay Duck (*Harpodon Nehereus*) fishery during 1950-72. **Indian J. Fish.** 22 (1 & 2); 1975 : pp 198-204.

The Bombay Duck catch forms about 7% of the total Indian landings. 97% of the catches of this fish comes from the coast of Maharashtra and Gujarat. This paper analyses the seasonal and annual variation of catches during the period studied.

NOBLE, A. : The Indian Mackerel in 1978. **Mar. Fish. Infor. Serv.** T & ESer. No. 8 ; 1979 : pp 1-11.

The Indian Mackerel occurs all along the coast, but over 90% is caught from the west coast of Quilon-Ratnagiri region. The season is during August-April, while the peak season is October-December. This paper reviews the statewide/gearwise production of the species.

RAJAN, K.N, K.K. SUKUMARAN and KRISHNA PILLAI, S. : On Dol net prawn fishery of Bombay during 1966-76. **Indian J. Fish.** 29 (1 & 2) 1982 : pp 30-36.

Discusses results of investigations conducted on the resources of prawns in the Bombay waters from 1966-67 through 1975-76. Analyses the data on catch per unit effort, the species composition and seasonal variations in catches.

RAMAMURTHY, S. : Observations on the prawn fishery of the Mangalore estuary on the south-west coast of India. **Indian J. Fish.** 19 (1 & 2) ; 1972 : pp 143-1 55.

Fishing for prawn is carried out at 3 or 4 centres in the estuary. This study covers the centre near Bengre, during 1963-68, Here shore seines (Kairampanis) are operated almost throughout the year in depths of 1-4 metres. Discusses the catch composition and seasonal variation.

RAO, G. S. : Observations on the marine prawn fishery by shore seine at Kakinada. **Indian J. Fish.** 26 (1 & 2); 1979 : pp 52.

Describes briefly the prawn fishery by shore seines in the inshore waters with notes on some aspects of the biology of a few commercially important species. The data covers the period 1966 to 1971 at Kakinada, an important fishing centre of the Andhra coast.

RAO P. V. : Penaeid prawn seed resource in the estuaries and backwaters of Karnataka and Kerala. **Mar. Fish. Infor. Ser. T & E. Ser. No.20** ; 1980 : pp 9-11.

Briefly presents information on prawn seed resource viz., distribution pattern, seasonal abundance, fluctuations and behavioural pattern.

2.2 Marketing

JNDJAN INSTITUTE OF MANAGEMENT (Ahmedabad). :
Marine fish marketing in India. Ahmedabad : IJM. Centre for Management in Agriculture, 1981.

Examines comprehensively the current and projected (1985) demand and supply situation, marketing practices and system, and recommends improvements in the marketing system to increase the welfare of the individuals/organizations in the system. The following areas are studied-demand for marine fish, supply situation, infrastructure facilities for marketing, mode of fish marketing, economics of fish marketing operations.

SRIVASTAVA, U.K. and others. : Managing marine fishing industry : an analysis of problems in harvesting and processing. A micro study in Gujarat. Ahmedabad : UM, 1979.

The following aspects are studied : the opportunities and problems in exploiting the marine fisheries resources in India's EEZ; the profile of the sample area viz., Veraval zone in particular and Gujarat in general; the economics of fishing operations-catches, unit value realization, inter-seasonal fluctuations in catches, overall, economics of various types of boats and incomes of fishermen ; the problems of fishermen with respect to working capital requirements, prices and income supports ; the operations of agents and merchants with a view to determining their marketing margins, modes of operations and returns on investment; processing units including their marketing margins and problems. Findings and recommendations of the study are presented at the end.

2.3 Credit and Finance

MURICKAN, J and others : A study on credit and indebtedness among the marine fishermen of south Kerala : preliminary report in 2 parts. Trivandrum : Loyola College of Social Sciences.

Reports the results of the study (1) to understand how the credit system works among the fishermen communities of Southern Kerala and how the characteristics and the functioning of this system vary according to the degree of participation of those communities in mechanization ; (2) to estimate the level of indebtedness of the same communities and to determine how it varies according to the level of their fishing technology and extent of their involvement in mechanization. As a comparison three fishing villages with different levels of involvement in mechanization have been studied.

PANIKKAR, K.K.P. : Coastal rural indebtedness : **a case study.** **Mar. Fish. Infor. Serv. T & E Ser. No. 18,** 1980 : pp 8-12

Attempts to identify the extent of indebtedness of fishermen in **Vizhinjam** in Kerala and the credit system prevailing in the area.

RAO, P .V. : Credit facilities for the development of small-scale fisheries in India. Rome : FAO, 1980 (IPFC/80/SYMP/EXP/2d.)

Describes the credit facilities extended in the form of loans and subsidies for development of small-scale fisheries in India by the central and state governments, through their development projects, fisheries cooperative societies, special programmes such as the integrated rural development programme, small farmers development agency, fish farmers' development agency and commercial banks.

3 Technology

3.1 Craft, Gear, Fishing Methods

General

CMFRI, Waltair Research Centre : Small-scale Fisheries at Lawson's Bay, Waltair. **Mar. Fish. Infor. Serv.T & E Ser. No. 6** ; 1979 : pp 10-13.

Fishermen from villages around Lawson's Bay do fishing with their traditional kattumaram and Masula boats and gear like boat seine, gill nets, shore seines, bottom-set gillnets, and hook and line. The catch. is generally disposed **off** in the local markets. This paper reviews the traditional fishery of this region by analysing the production by gear type/species etc. during the years 1970-78.

LUTHER, G. and others. : Adventurous launching of kattumarams for monsoon fishery at Valiathura, Trivandrum. **Mar. Fish. Infor. Serv. T & E Ser. No. 40** ; **1982** : pp 1-5.

The traditional fishermen of Valiathura and **adjacent villages** use the Valiathura pier for launching their kattumarams during the rough weather (off season). This paper presents the details of the operations and fish landing.

LUTHER, G and others. : Present status of small-scale traditional fishery at Vizhinjam. **Mar. Fish. Infor. Serv. T & E Ser. No.38** ; **1982** : pp 1-17.

Fishing is a year-round activity in Vizhinjam area, due to the **good** marketing outlets and facilities for launching traditional boats even during monsoon. This paper analyses the annual production: craftwise/ gearwise, catch composition in the past 12 years from 1968 to 1979 in this region.

MADAN MOHAN. : Kalara Fisheries of Pulluvila Village. **Indian J.Fish.** 30 (1) ; 1983 : pp 13.5142.

An account of the Kalara fishery of Pulluvila village, south of Trivandrum in Kerala state during 80 and 81 is given. The gear and craft used, the fishing operations, fishing grounds, species composition of the catches and the economics of the fishery are discussed.

Craft

BALAN, R. : Investment reduction and increase in service life of kattumaram logs. Madras : BOBP, 1980 (BOBP/WP/1).

Identifies and evaluates methods to increase the service life of kattumarams, the traditional fishing craft used along the east coast of India. The methods involve both chemical treatment and physical protection. Also examines ways to reduce the initial investments on kattumaram **logs** by examining alternative and less expensive species of suitable timber for the logs.

HORNELL J. : Origins and ethnological significance of Indian boat designs : read in abstract at the Lahore Meeting of Indian Science Congress, January 1918. Publisher not known. Madras : The author. Dept. of Fisheries.

It is in 5 parts. Part 1 is on existing boat types in India including Pakistan, Sri Lanka and Maldives. Different categories of boats of the various regions are described--(1) North-west coast, (2) Bombay coast down to Mangalore, (3) Malabar and Travancore, (4) Gulf of Mannar, (5) Palk Bay and Strait, (6) the east coast north of Point Calimere, (7) The Maldives and Laccadive Islands, (8) Andaman and Nicobar Islands. Part 2 analyses information from ancient scriptures, classics and writing of medieval writers on ancient sea-trade by countries like Egypt, Persia, Greece, Arabia and China with

India. Part 3 discusses the naval and mercantile society of India in the medieval period. Part 4 describes the vessels used by the ancient Indians i.e. before the 15th century. The last part studies the influence of other countries on the boat design and in particular the Polynesian element in the fishing communities of India. The whole text is supplemented with a number of drawings and photographs.

KURIEN, J and JAYAKUMAR S. R. : Motorization of traditional canoes : the Purakad experiment. Trivandrum : Propamme for Community Organization, 1980.

Presents the results of the analysis of the performance of motorized canoes in Purakad, Kerala as a broad guideline on the economic viability and social consequences.

MATSYASAGAR CONSULTANCY SERVICES :: Boat-building materials for small-scale fisheries in India. Madras : BOBP 1980 (BOBP/WP/9).

Studies the trends in prices and availability of boat-building materials and the possibilities of alternative materials. Covers the following boat-building materials-timber, fibre-reinforced plastics, ferrocement, steel and aluminium.

MENON T. R. : Inventory of kattumarains and their fishing gear in Andhra Pradesh and Tamilnadu. Madras : BOBP 1980 (BOBP/WP/2).

Presents the results of the survey carried out in some fishing villages of Andhra Pradesh and Tamilnadu to gather information on the types of kattumarams used in the region, the kinds of gear used with them, the methods of operation, catches and costs. A brief summary of kattumaram types and their economic importance is given. Individual profile of each craft includes the following details-region/area of operation, timber used, size, cost, cost of accessories, repair and replacement cost, sail particulars (rig cost), fishing gear used (design details and cost), fishing season, fishes caught, crew, distance to fishing ground, fishing time, average catch, surf crossing ability, Similarly a profile of the

types of gear used, is also given. The descriptions of the craft and gear are supplemented with technical drawings and photographs.

Gear/Fishing Methods

GOKHALE, S. V. : Operation of the Dol net off the Saurashtra Coast. **J. Bombay Nat. Hist. Soc. 54 (3) ; 1954 : pp 714-725.**

Gives a full description of the net and the ropes attached to it, the craft, and describes the precise method of shooting and hauling the net as practised in Saurashtra waters exclusive of Kodinar. The method of operating the net in the Saurashtra waters is different from the methods employed off the Bombay coast. It is used mainly in Bombay Duck fishery.

HORNELL, J. : Fishing methods of the Madras Presidency. Pt 1 : Coromandel Coast. Madras : Department of Fisheries, 1927 (Madras Fisheries Department Bulletin; 18, pp 62-110).

Describes the nets employed in marine and backwater fisheries in the Coromandel Coast i.e. the shore-line stretching from Point Calimere to 100 miles north of Madras. For each net the following information is given—design and mesh size, area and method of operation and the type of fish caught.

JAMES, D. S. B. R. : Note on the torch (Soonthu) fishing for White Bait off Rameshwaram in Palk Bay. **J. Bombay Nat. Hist. Soc. 64 (1); 1967 : pp 123-125**

Soonthu fishing is carried out at Rameshwaram usually between April and September. This appears to be the most successful method for white bait fishing.

MUTHIA, C. : Driftnet fishery of the Dakshina Kannada Coast. **Mar. Fish. Infor. Serv. T & E Ser. No. 37 ; 1982 : pp 8-15.**

Odubale (drift gillnet) is operated from Thoni or Vallam in the southern coast of Karnataka during March/April by immigrant fishermen from Kanyakumari and Trivandrum. This paper analyses the annual production of this fishery during 1979-81.

PANICKER, P. A. and others: A new fishing gear for traditional craft. Paper presented at the symposium on harvest and post-harvest technology of fish, 24-27 November 1982, Cochin. Cochin: Society of Fisheries Technologists, 1982.

Results of experimental fishing conducted with a low-cost two-boat purse seine of 250 x 33 m size, from 2 non-mechanized traditional fishing craft (Thanguvallam) at 10-20 m depth off Chellanam are presented.

PILLAI, S. K. : Some observations on Dol net fishery at Sassoon Dock, Bombay. *J. Bombay Nat. His. Soc.* **80** (2); 1983.

Describes the species composition of the Dol net catches during 1971 at Sassoon Dock, a major landing centre in Bombay, grouping them into 2 main categories, those occurring throughout the year and those having seasonal occurrence. Also describes them according to market categories. The estimated dol net catches fluctuated between 275 and 1485 tonnes during the year. The monthly average catch formed 41.6% of the total landings. A list of 33 species caught and their percentage composition is given.

SATYANARAYANA, A.V.V. and SADANANDAN, K. A. : Chala Vala encircling gillnets for Sardine and Mackerels of the Kerala coast with special reference to their design and construction. *Indian J. Fish.* **9** (2) ; 1962 : pp 145-155

Two varieties of Chala Vala, namely Mathi Chala Vali for sardines and Aila Chala Vala for mackerels, are in operation in Kerala. This paper gives a detailed account of the design, construction, preservation and method of operation. Details of specifications and material used for webbing, ropes attached to the net fabric, buoyant materials on the head rope and types of sinkers in the foot rope are given. Constructional details including lacing and joining of different parts of webbing, method of rigging the

ropes to the net and distribution of floats and sinkers on the respective ropes are presented.

3.2 Fish Culture

'KURJAN, C.V. and others (Ed.). Symposium on Coastal Aquaculture, Cochin, 12-18 January 1980. Abstracts of papers presented. Cochin : Marine Biological Association of India, 1980.

The papers are on various aspects of fresh and brackishwater -aquaculture. Though the coverage is international, the majority of the papers are on brackishwater culture in India. The following topics are covered-culture technology, production and economics of finfish culture. crustacean culture, molluscan culture, seaweed culture, polyculture and integrated farming, culture of live 'food organisms; nutrition and physiology: environmental management ; postharvest technology and management ; socio-economic and legal aspects of coastal aquaculture; manpower, training and extension ; strategies for coastal aquaculture development.

'SILAS, E.G. and others (Ed). Proceedings of the Symposium on Coastal Aquaculture, Cochin, India, 12-18 January 1980. Part I : Prawn Culture. Cochin : Marine Biological Association of India, 1982. (Symposium Series 6.)

Presented are papers on various aspects of prawn culture (both 'fresh and brackishwater), which include topics like technologies of the culture of various organisms ; production intensification by integrated crop-livestock-fish farming technologies ; assessment of social, economic and legal aspects of culture.

4 Development Work

'BLASE, F.W. Coastal village development in four fishing communities of Adiramapattinam, Tamilnadu. Madras: BOBP, 1982. (BOBP/WP/19).

Describes the four fishing communities of Adiramapattinam, a town about 350 km from Madras, and analyses their social structure. Also details the strategy adopted by the Bay of Bengal, Programme to bring about social change in these communities and the experimental work undertaken in this direction.

5 General

India

CMFRI. All India Marine Fisheries Census : Frame survey 1973-77.
Mar. Fish. Infor. Serv. T &E Ser No. 3, 1978: RP 2-p

Presents data on fishing villages, landing centres, fishermen population, active/fisherwomen, mechanized and non-mechanized boats and different types of indigenous gear in each maritime state. Similarly descriptive information for each state is also presented.

CMFRI. Present status of small-scale fisheries in India and a few neighbouring countries. Papers released to furnish background information at the Seminar on the Role of Small-Scale Fisheries and Coastal Aquaculture in Integrated Rural Development, Madras, 6-9 December 1978. Cochin : CMFRI 1981. (CMFRI Bulletin. 30 B.).

Includes papers; on coastal states of India under the following titles—Role of small-scale fisheries in Karnataka and its impacts on rural economy; Status of traditional fisheries in Kerala: Small-scale marine fisheries of Tamilnadu; Present status of small scale fisheries in Pondicherry ; Present status of small-scale marine fisheries in Andhra Pradesh ; Marine fisheries of Orissa ; Status of small-scale fisheries in Andaman and Nicobar Islands ; Present status of small-scale fisheries in Lakshadweep ; Present status of small-scale fisheries and aquaculture and scope of their development under the rural development programmes in Gujarat ; Present status of small-scale fisheries of Maharashtra with a note on the socio-economic survey of Thana District.

CMFRI. Proceedings of the Seminar on the Role of Small-scale Fisheries and Coastal Aquaculture in Integrated Rural Development, Madras, 6-9 December 1978. Cochin : CMFRI 1981. (CMFRI Bulletin '30-A.)

Includes papers presented at the seminar under the following titles—Present status and role of small-scale fisheries in India ; Operational constraints of artisanal fishermen ; Traditional practices of coastal aquaculture and sustenance fishery in India ; Socio-economic

conditions of the traditional fishermen ; Community development and infrastructure facilities for improving the socio-economic condition of fishermen ; Poonthura, a case study of socio-economic conditions of fishermen in Kerala ; Nutrient intake and deficiency diseases in fishermen community ; Problems and prospects in coastal aquaculture in Gujarat ; Recent technological advances in coastal aquaculture in India ; Small-scale fisheries development projects at Muttom, Kanyakumari District, and a case study ; Rural aquaculture project and its impact on the development of rural areas ; Certain aspects of preservation of the "fish suitable for small-scale fisheries ; Recycling and utilization of fish waste ; Some options for improvements in traditional handling and processing of fish; Financing small fishermen; challenging task : Public policies and planning of rural fisheries in Kerala etc.

CMFRI. Fishery Resources Assessment Division. All India census of marine fishermen, craft and 'gear 1980. Mar. Fish. Infor. Serv. T & E Ser. No. 30 ; 1981 : pp 1-30.

The census covers statewide data on marine fishing villages, landing centres, fishermen households, fishermen population, their educational status, fishermen engaged in actual fishing ; mechanized' and non-mechanized fishing craft by type and fishing gear by type.

RAO, D.S. and others. Mud banks and coastal erosion in relation to fisheries. Mar. Fish. Infor. Serv. T & E Ser. No. 19 ; 1980 : pp 1-10.

Mud banks and coastal erosion, the two contrasting phenomena occur along the west coast during the south west monsoon, and have a profound impact on the socio-economic condition of the coastal population. This paper presents a brief account of the study undertaken by CMFRI since 1948 to monitor the features of the mud banks to understand the phenomenon and its effect on fishery.

SILAS, E.G. and ALAGARSAMI, K. Country status report on India. Proceedings of the IPFC 19th Session Kyoto, Japan,' 21-36 May 1980. Section 3. Symposium 'on the Development and Management of Small-Scale Fisheries pp 109-136. Bangkok : FAO 1980.

Presents a summary of the status of the small-scale fisheries in India and discusses the problems and prospects. Diversification of fisheries and introduction of coastal aquaculture as a component of technology package for the integrated rural development of the coastal fisheries sector has been emphasized. Suggests that the fisheries cooperatives be reconstituted as in the dairy sector. A 12 point strategy for the development of small scale fisheries has been formulated.

MARINE Small-scale Fisheries of India : A General Description.
Madras : BOBP. 1983 (BOBP/INF/3)

Attempts a brief and factual presentation of data and baseline information on the main features of the small-scale marine fisheries of India. Includes the following areas-fishery resources ; fishing fleet ; infrastructure and service facilities: production: handling and processing ; distribution and marketing ; export and import ; coastal aquaculture ; socio-economics; fisheries administration and institutions ; industry organization: government policy and development plans. This is a revised and updated edition of an earlier version prepared in 1976.

Coastal States

Andhra Pradesh

ASSESSMENT of Problems and Needs in Marine Small-scale Fisheries : of Andhra Pradesh. Madras : BOBP, 1977.

Highlights problems related to the present situation and needs for future development of the fisheries. Possible remedial measures to effect improvement are discussed and recommendations are made which may serve as identification of suitable schemes for development support.

Goa

GENERAL Description of Marine Fisheries : Goa, Daman and Diu.
Madras : BOBP, 1979 (RAS/77/044/WP/23)

A brief and factual presentation of data and baseline information on marine small-scale fisheries in Goa. The following aspects

are covered-fishery resources; fishing fleet; infrastructure and service facilities ; production ; handling and processing ; distribution and marketing ; export and import ; socio-economics ; fisheries administration and institutions ; industry organization ; government policy and development plans.

Gujarat

GENERAL Description of Marine Small-scale Fisheries : Gujarat.
Madras : BOBP, 1979 (RAS/77/044/WP/29)

A brief and factual presentation of data and baseline information on marine small-scale fisheries in Gujarat. The following aspects are covered-fishery resources ; fishing fleet ; infrastructure and service facilities ; production, handling and processing; distribution and marketing ; export and import ; socio-economics ; fisheries administration and institutions ; industry organization ; government policy and development plans.

KARBHARI, J.P. : Scientific common and local names of commercially important marine fishes and shell fishes of Maharashtra and Gujarat coasts. Mar. Fish. Infor. Ser. T & E Ser. No. 44 ; 1982 : pp 18-23.

Karnataka

GENERAL Description of Marine Small-scale Fisheries : Karnataka.
Madras : BOBP, 1978 (RAS/77/044/WP/22)

A brief and factual presentation of data and baseline information on marine small-scale fisheries in Karnataka. The following **aspects** are covered-fishery resources ; fishing fleet ; landing and shore facilities ; production, handling and processing ; distribution and marketing ; export and import ; socio-economics ; administration and institutions ; corporations and cooperatives ; government policy and development plans.

Kerala

GENERAL Description of Marine small-scale Fisheries : Kerala.
Madras : BOBP, 1980 (RAS/77/044/WP/30)

A brief and factual presentation of data and baseline information on marine Small-scale fisheries in Kerala. The following aspects are covered-fishery resources ; fishing fleet ; infrastructure and service facilities ; production ; handling and processing ; distribution and marketing ; export and import ; socio-economics ; fisheries administration and institutions ; industry organization ; government policy and development plans.

Maharashtra

GENERAL Description of Marine-Small-scale Fisheries:Maharashtra.
Madras : BOBP, 1978 (RAS/77/044/ WP/24)

A brief and factual presentation of data and baseline information on marine small-scale fisheries in Maharashtra. The following aspects are covered-fishery resources ; fishing fleet ; infrastructure and service facilities ; production, handling and processing ; distribution and marketing ; export and import ; socio-economics: fisheries administration and institutions ; industry organization ; government policy and development plans.

PIETERSZ, V.L.C. and others : Assessment of Problems and Needs in Marine Small-scale Fisheries : Maharashtra.
Madras : BOBP, 1978 (RAS/77/044/WP/27)

Identifies the major problems and needs of marine small-scale fisheries in the state of Maharashtra, and outlines possible development schemes suitable for external financing and technical support, in close collaboration with the Directorate of Fisheries.

Orissa

ASSESSMENT : of Problems and Needs in Marine Small-scale Fisheries : Orissa. Madras : BOBP, 1977 (RAS/74/031/WP/8)

Highlights problems related to the present situation and needs for future development of the fisheries. Possible remedial measures to effect improvement are discussed and recommendations are made which may serve as identification of suitable schemes for development support.

MARINE Small-scale Fisheries in Orissa : A General Description.
Madras : BOBP, 1985. (BOBP/INF/7)

A brief and factual presentation of data and baseline information on marine small-scale fisheries in Orissa. The following aspects are covered-fishery resources; fishing fleet; infrastructure and service facilities ; production, handling and processing ; distribution and marketing ; export and import ; socio-economics ; fisheries administration and institutions ; industry organization, government policy and development plans.

ORISSA, Directorate of Fisheries. The Chilka Lake. Cuttack :
The Directorate, 1970.

A general description of fisheries in the Chilka region is presented. The following aspects are covered-hydrographics, fish fauna, types of fisheries, crafts and gear, marketing, fishermen's cooperatives and socio-economics of the fishing community. This is followed by papers on various types of fisheries and their problems.

Tamilnadu

ASSESSMENT of Problems and Needs in Marine Small-scale
Fisheries: Tamilnadu. Madras : BOBP, 1977
(RAS/74/ 031/WP/ 15)

Highlights problems related to the present situation and needs for future development of the fisheries. Possible remedial measures to effect improvement are discussed and recommendations are made which may serve as identification of suitable schemes for development support .

MARINE Small-scale Fisheries of Tamilnadu : a general description.
Madras : BOBP, 1983. (BOBP/INF5)

A factual and statistical summary of the existing infrastructure, the resources, the government set-up and development plan concerning marine small-scale fisheries and of the socio-economic conditions and production and post-harvest practices of the fisherfolk. This is a revised and updated edition of the 1976 version.

West Bengal

ASSESSMENT of Problems and Needs in Marine Small-scale
Fisheries : West Bengal. Madras : BOBP, 1977.

Highlights problems related to the present situation and needs for future development of the fisheries. Possible remedial measures to effect improvement are discussed and recommendations are made which may serve as identification of suitable schemes for development support.

GENERAL Description of Marine Small-scale Fisheries : West Bengal. Madras : BOBP, 1977 (RAS/74/031/WP/9)

A brief and factual presentation of data and baseline information on marine small-scale fisheries in West Bengal. The following aspects are covered-fishery resources ; fishing fleet ; infrastructure and service facilities ; production, handling and processing ; distribution and marketing ; export and import ; socio-economics ; fisheries administration and institutions ; industry organization ; government policy and development plans.