STATE AND NON-STATE MARINE FISHERIES MANAGEMENT:

LEGAL PLURALISM IN EAST GODAVARI DISTRICT, ANDHRA PRADESH, INDIA

....

Sarah Southwold-Llewellyn

Rural Development Sociology
Department of Social Sciences
Wageningen University
Wageningen, The Netherlands

Sarah.Southwold@wur.nl
Sarah.Southwold@gmail.com

Sarah Southwold-Llewellyn, 2010

Key words: marine fisheries, traditional fishing, mechanised fishing, management, legal pluralism, East Godavari District

This 2010 report is a revision of an earlier working paper, *Cooperation in the context of crisis: Public-private management of marine fisheries in East Godavari District, Andhra Pradesh, India.* IDPAD Working Paper No. 4. IDPAD: New Delhi and IDPAD: The Hague, 2006 (www. IDPAD.org).

The Project, Co-operation in a Context of Crisis: Public-Private Management of Marine Fisheries in South Asia, was part of the fifth phase of the Indo-Dutch Programme for Alternative Development (2003-2006).

IDPAD India Secretariat: Indian Institute of Social Science Research (ICSSR), New Delhi

IDPAD The Netherlands secretariat: Netherlands Foundation for the Advancement of Tropical Research (WOTRO), The Hague, The Netherlands

Acknowledgements

My research in East Godavari District would not have been possible without the cooperation and help of many more than I can acknowledge here. The help of many Government officers is greatly appreciated. On the whole, I was impressed by their professionalism, commitment and concern. They gave me their valuable time; and most of them were extremely candid. Much that they told me was 'off the record'. I have tried to protect their anonymity by normally not citing them by name in the report. There are far too many to individuals to mention them all. However, I would like to mention a few individuals: Dr. P. Krishnaiah, Commissioner of Fisheries, and his staff, particularly, K.S.R. Raju, Assistant Director of Fisheries and his staff, Kakinada; Dr. R. Narayanakumar, Senior Scientist, Kakinada Research Centre, CMFRI; M. Ram Gopal Roa, Prinicple of the State Institute of Fisheries Technology, Kakinada, and several of his staff; B. Madhusudhana Rao, Senior Environmental Engineer, Pollution Control Board; Dr. V.V. Sarma, Deputy Director of National Institute of Oceanography provided helpful maps; G.V.S. Prakasa Rao, Chief Planning Officer, Kakinada and his staff provided data on several important data bases; V. R. Vijayaraghava Naik, Joint Director of Industries, was very helpful and hospitable.

Dr. Mrs. T. Rajyalakshmi, former Director CIBA (ICAR) and her husband, Dr. T. Sasibhushan, Society for the Promotion of Integrated Coastal Areas Management, welcomed me into their home and shared their natural scientific research. T.S.L.Nayakar, former MLA, and Dr. Aluri Vijayalakshmi, President, Loksatta, East Godavari District also made valuable contributions.

During a reconnaissance trip to East Godavari District, Venkatesh Salagrama, Integrated Coastal Management, Kakinada, opened many doors and he generously lent me his staff which enabled me to visit many villages in East Godavari, Visakhapatnan and Srikakulam Districts. The hospitality of Venkatesh and his wife, Sujata, is very much appreciated.

During the major fieldwork period, Professor Dr. T.S.R. Sai and his wife Mani became good friends. They helped me find and furnish a flat and were available to help me with any practical problem.

The staff of the Department of Anthropology, Andhra University, Visakhapatnam were both welcoming and helpful. Particularly, I wish to thank

Professor Jai Kishan and many of his staff who made several useful suggestions concerning my research. In particular, Dr. V. Subramanyam was very helpful. Not only did he help me find a research assistant, Mr. Lakshman Rao, he even traveled to Kakinada to help with our introduction to the fisher village, Mulapeta, which was the main village where research was done. I wish to thank Lakshman and his friend, Eswara Rao Boni, who were my assistants during fieldwork from August to December, 2004. Without them, I could not have done the research.

An aim of this report was to give the concerns of fishermen a voice. Needless to say, my greatest thanks are to the fishermen and the fish traders in East Godavari District. They gave us their valuable time and shared their many problems and hospitality with us. In Mulapeta, the Sarpanch of the village, Upmaka, gave us practical help throughout the research. The head of the caste elders, Kambala Kanaka Raju was an excellent informant.

I also wish to thank Maarten Bavinck (University of Amsterdam, The Netherlands) for inviting me to participate in the project. The project workshops have been stimulating; and I have enjoyed greatly working and arguing in academic debate with the other researchers on the project who worked in different districts: Kerala --K.T.Thomson (Cochin University of Science and Technology, India); Gujurat -- Derek Johnson (University of Manitoba, Canada) and Jyothis Sathyapalam (Centre for Economic and Social Studies, Hyderabad, India); Goa-- Janet Rubinof (York University, Canada); Sri Lanka -- Oscar Amarasinghe (Rahuna University, Sri Lanka); and Tamil Nadu – Maarten Bavinck and K. Karunharan. Svein Jentoft (University of Tromso, Norway), as an advisor for the project, made great contributions to our debates.

This report is a revision of the earlier working paper published in 2006. The time frame, however, is that of the original research in 2004. It contains more descriptive detail than is often found in academic or in policy oriented publications. The information about nets, boats, fishing techniques, and organisation of fishing, for example, may seem common place to those familiar with fishing. When I began this research, it was the first time I had researched fishing activities or fishermen. Consequently, it took much time to acquaint myself with the technology. Hopefully, some of these details will help future researchers. Given the diversity of fishing technologies, the report should prove useful for those not familiar with the area, especially with regard to its implications for policy formulation.

This version woefully remains a work in progress. I had hoped that the information presented here would be supplemented with detailed analyses. Unfortunately, time and poor health have impeded my work.

Regardless, I have decided to make the information in the report available for a number of reasons. The context is rapidly changing in East Godavari. It may be useful for other researchers to have some comparative information. The website for IDPAD no longer exists which means that the original report is no longer available. My main objective is to give a voice the fishers' problems, as they see them. Although it is not stressed in this report, everyone in fishing is between a rock and a hard place. Some of the information and issues raised are not widely addressed, if addressed at all by both policy makers and many academics who have little contact with fishers.

Contents

CHAPTER ONE: INTRODUCTION

1.1 THE TOPIC

This report is based on a working paper on the plural legal frameworks of fisheries management in East Godavari District, Andhra Pradesh. The working paper was one of six comparative research studies undertaken during 2003-2006 as part of the Indo-Dutch Programme for Alternative Development (IDPAD) project entitled *Co-operation in a context of crisis: public-private management of marine fisheries in South Asia.* The other district studies in India were conducted in Gujurat, Goa, Kerala, and Tamil Nadu and one district in Sri Lanka.

The researchers were from universities in India, Sri Lanka, the Netherlands and Canada. As a team, we represented a wide spectrum of the social science perspectives within the disciplines of anthropology, economics and geography. This is represented by the different approaches and emphases of the individual working papers. In order to facilitate comparability, we designed a conceptual framework (Figure 1.1) that was used in all the studies. This framework guided the organisation of all the working papers, and this revised report. Consequently, some points are mentioned in a skeletal way are included in order to enable comparisons.

Central to the conceptual framework is the notion that multiple legal systems (state and non-state) are operating in the management of fisheries. The state legal systems are not cohesive. Rather the state legal systems represent a number of laws which affect fisheries which may have contradictory aims. Those laws specifically concerned with fisheries aim to: 1) maintain fishing stocks; and 2) manage sea territories. The non-state systems have developed to meet the management objectives of different groups of fishers, often representing different modes of fishing. Both state legal systems and non-state legal systems evolve in response to fishing problems. For the purposes of the project, we focused on fishing problems related to resource allocation and resource health. The interaction between these legal systems creates a legal pattern.

In this report on East Godavari District, a stakeholder analysis of the perceived core problems of fisheries was undertaken to understand the multiple non-state and state legal systems and how they interact. This was followed by a detailed analysis of

disputes between different stakeholders, concerning the management of fisheries. Focusing on the effectiveness of the legal pattern (formed by the interaction between the legal systems) with regard to maintenance of resource health and resource allocation has led to an analysis of the patterns of interactions between intra- and inter-legal systems, especially those interactions involving disputes. Analysis of disputes has a number of advantages: 1) it highlights the normative rules; 2) it shows the actual practices; 3) it illustrates the heterogeneity within a stereotyped homogeneous category of stakeholders; and 4) it highlights some of the potential problems of establishing alternative management organisations or of improving those that exist.

An underlying aim of the researcher of this report was to give a voice to all actors involved in fishing. Initially, the researcher had a bias toward the problems of the artisanal or small-scale sector fishery. In East Godavari District, the small-scale sector has been defined to include all those fishers who are not using mechanised trawl net technology. However, unlike in many other areas, the mechanised boats in East Godavari District are comparatively small boats. Most are between 9-13 metres long with a maximum engine capacity of 108 hp. A bias in the research design was the assumption that the trawler fishers were largely responsible for the crisis in fisheries faced by the small-scale fishers. By taking a stakeholder analysis, the researcher was able to appreciate that this was too facile. In East Godavari, most fishers and those in occupations related to fishing are facing extremely difficult times with regard to sustaining their livelihoods. I have presented their views and make no judgement about the authenticity of the views expressed. I have also tried to protect their anonymity.

It should also be pointed out that the detailed ethnography of this report concerns only those fishers based in harbours around Kakinada and the coast north of Kakinada. This roughly coincides with the Kakinada Division of the Fisheries Department, with the exclusion of Tallarevu Mandal with the exception of Hope Island. According to the Fisheries Department lists, there are 92 fisher villages in East Godavari District; 63 are in the Kakinada Division of the Fisheries Department; and of these 50 are included in this report. (See Table 2.1 for a full list). Since the focus of the study was marine fishers, it was decided not to include those fishers living in the mangroves south of Kakinada. The reasons for this were the limitations of time (five months from August to December, 2004) and of human resources. The

research was done by one senior researcher and two junior assistants. More details about the methodology are given in Appendix 1. It also should be pointed out that this report is based on the preliminary analysis of only a small part of the data collected.

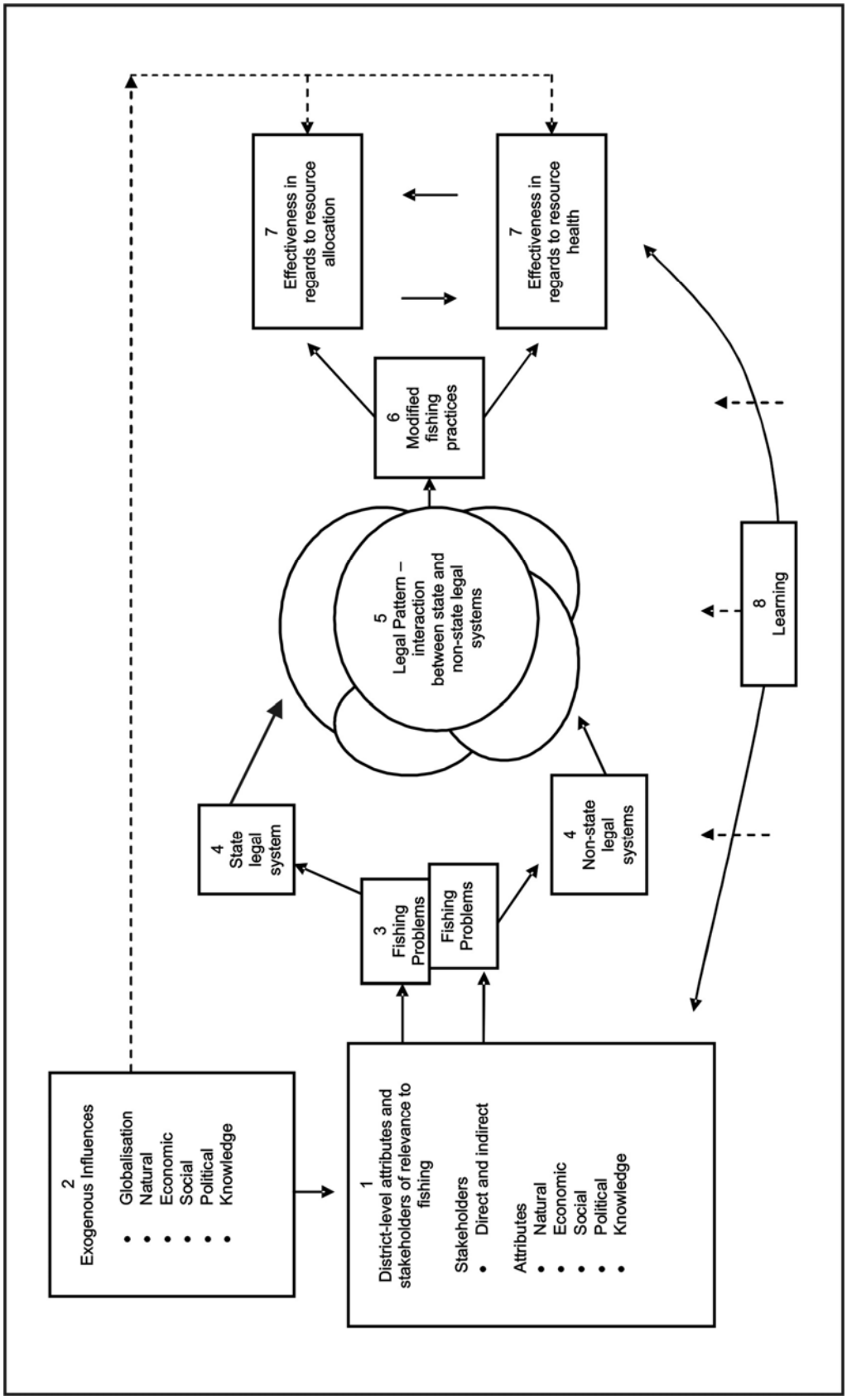


Figure 1.1: Conceptual Framework

1.2 DISTINGUISHING FEATURES OF EAST GODAVARI DISTRICT

Fishing makes a major contribution to Indian exports. Its importance is under appreciated by central and state governments as is indicated by the fact that it does not have its own Ministry. Symptomatically, little attention is given to fisheries in development plans for East Godavari District. For example, in the East Godavari District Profile, 2002-3, fisheries is not mentioned, except as a sub-sector of animal husbandry (www.apind.com/eg).

In Andhra Pradesh, India, as elsewhere in the world, small-scale fisheries are in crisis. The income from fishing is declining for all sectors of fishing. The causes are attributed to a decrease in fish stocks caused by pollution and over-fishing. However, the total recorded marine production in East Godavari District has dramatically increased from 16,697 tonnes in 1993-4 to 54,790 tonnes in 2003-4. During this same ten year period, there have been dramatic increases followed by decreases in the numbers of registered fishing vessels in all sectors. The reasons for this apparent anomaly are not clear. Fewer larger boats may be bringing larger catches. Price fluctuations may be affecting some sectors more than others. Little can be concluded, however, because of the quality of the available data on both landings and the number of boats.

There are a number of other features which distinguish East Godavari District from a number of other district studies. First, the majority of fishers are in the non-mechanised sector. Secondly, there are no industrial mechanised boats. The entire East Godavari District fleet of 736 mechanised boats are between 9-13 metres long with engines of up to 108 hp. Thirdly, not only are the majority of fishers operating in the non-mechanised sector, but Andhra Pradesh Fisheries Department data for 2000-01 and 2001-02 show that in East Godavari the non-mechanised sector catch for marine fish and shrimp was greater than that for the mechanized sector.(See Table 3.2).

Fourth, the district is divided into two distinct ecological zones. South of Kakinada is the Godavari River Delta, part of which is the second largest mangroves in India. The zone is dominated by the *Agnikula Kshatriya* caste who are traditionally river fishers. All the mechanized boats using trawling gear owned by fisher castes are *Agnikula Kshatriya* who have migrated predominately to Yetimoga on the

outskirts of Kakinada. North of Kakinada, the coast is characterized by sandy beaches, a wide continental shelf, a sandy bottom, and rough surf. The coast is inhabited predominately by traditional marine fisher caste, *Vadabalijas*. Therefore, a fifth feature is that modes of fishing coincide largely with caste.

A sixth feature is the rapid industrial development in Kakinada which is part of a larger coastal development corridor being developed between Kakinada and Visakhapatnam. Plans include pharmaceuticals, steel, oil and gas refineries, and ceramics. A deep sea port has been established to stimulate industrial development. Furthermore, the second largest deposits of oil and gas in the South Asian Region are beginning to be exploited in the Godavari Delta.

Ironically, the seventh feature is the largest number of shrimp hatcheries in India which were built during the 1990's because of the purity of the sea north of Kakinada. These hatcheries supply aqua culture in East and West Godavari Districts. The last feature is the presence of intensive, irrigated agricultural production which also contributes to pollution that has an adverse affect on aqua culture, as well as on fish and shrimp stocks.

1.3 CORE PROBLEMS

There is agreement in the perceptions of both fishers and government officials in the Fisheries Department about what are the core fishing problems which are resulting in a decline in livelihoods: 1) mechanised boats fishing close to shore, 2) cost of fuel, 3) decreasing stocks, 4) wild shrimp seed collection, 5) inability of Fisheries Department to enforce legislation, and 6) the fishers' lack of political power, and 7) industrial pollution. In addition to these, Fisheries Department Officials note: 8) mesh size of nets, 9) target of tiger shrimp, 10) need to diversify crafts and target species, 11) need for a minimum support price, and 12) fisher elders selling out to industrial interests, oil exploration interests, and hatcheries.

The convergence of the perceptions of the core fishing problems raises a central issue of this report. If fishers and government officials perceive that the core fishing problems are the same, why is the legal pattern (composed of the non-state legal system and the state legal system) insufficient to solve those core fishing problems which they could address by their fishing practices?

1.4 CHANGES IN FISHING PRACTICES

The response of fishers to these core problems has led to competition and conflicts over fishing territories at all levels of fishing, caused in part by changing migration patterns and the down scaling of fishing technologies. Another consequence has been the weakening of the non-state legal systems to enforce their own rules as well as those for the state.

1.5 STATE LEGAL SYSTEM

The response of the government has been the introduction of legislation to address some these problems, such as the Fisheries Regulation Act (1995), the Ban on Seed Nets (2002), the Coastal Zone Regulation Act (1991). In addition, the Pollution Control Board has powers to regulate pollution. Furthermore, the Fisheries Department, often in conjunction with other agencies, has a number of projects to improve the welfare of fishers.

The state system depends on the non-state legal system to enforce state laws concerning fishing. Although the Fisheries Department has statutory powers to enforce the Fisheries Regulations Act, they have limited resources for implementation. The main thrust of the Fisheries Regulation Act (1995) are:

1. *Fishing Zones:* 8 km from shore exclusively for non-mechanised boats. Mechanised boats below 15 meters (i.e. all boats in East Godavari) are allowed to operate from 8 km.
2. *Fishing Ban:* April 15- 31 May. Applies to mechanised boats only since 2004.
3. *Nets:* Mesh below ½ in (12.7 mm).

1.6 NON-STATE LEGAL SYSTEMS

Comparatively, the capacity of the fishers' leaders to enforce the rules pertaining to their fishing sector are related to the degree to which their power is embedded in social, religious, economic and political relationships. This is strongest

with regard to the small-scale fishing communities, whose leaders are the caste elders. This is turn is related the degree to which the fishing activity is village-based. Hence, there is the greatest control in shore seines, as compared with small-scale boat fishing. At the other extreme is the non-state legal system of mechanized boat owners' associations. The officers of the boat owners' associations are elected representatives of the owners. There is no organization to represent the interests or manage the practices of mechanised boat crews. The boat owners' associations have emerged with the introduction of mechanised boats and are comparatively less embedded in wider social relations. Mechanised boat owners and crew have moved from their ancestral villages in the Godavari Delta to areas near major fishing harbours. It is significant that most of the rules concerning mechanised boats are those of the state.

1.6.1 Small-scale Fishers' Legal System

Rules for regulating fishing are based on the logic of equity. An elder's authority is based on his earned reputation for fair decisions. However, the reach of the elder's authority is limited to his own village and is limited by what members of his community consider to be reasonable. In this case, what is reasonable is constrained by perceptions of meeting livelihood needs. One major function of the elders is to represent fishers in their village in the adjudication with fishers in arenas outside the village.

1.6.2 Two Boat Owners' Associations

Presidents of these associations claim that they can impose fines for mesh size violations and fishing during the ban. However, both presidents said that there was nothing they could do to make mechanised boats comply with the 8 kilometre rule. The authority of the officers is weak because they are not respected by many of their members. One of their major roles is to mediate with caste elders in disputes with small-scale fishers.

1.7 INTERACTION BETWEEN LEGAL SYSTEMS

There is general agreement among all fishers that the rules of both the state and the non-state legal systems are equitable and reasonable. The problem is not the rules but the context of declining livelihoods. Within this context, the structural limits of the legal systems are not capable of enforcement.

An example is the conflicts over fishing territories. Although most attention is given to the conflicts between mechanised boats and small-scale fishers, this is a simplification. There are conflicts at every level of fishing both within and between modes of fishing. For example, the smaller, poorly maintained mechanised boats and the small-scale motorised boats cannot afford expenditure on diesel in the context of decreasing prices for shrimp and the increasing costs of diesel; hence they are fishing so close to shore that they are in the territory of the shore seines and non-motorised boats. The government has increased the diesel subsidy; but it is not sufficient. In contrast, the well equipped boats fish beyond 23 kilometres because the fish stocks are greater there, even though they are not legally obliged to do so.

The adjudication procedures for dispute settlement are clear and well established. The interactions between the two non-state legal systems break down because of the difficulty small-scale fishers have in identifying boats and their relatively weak position. Further, when a boat is identified, the mediated compensation is rarely paid. Both Boat Owner Association Presidents said that there was nothing they could do to make mechanized boats comply with the eight kilometre rule. The leaders for both non-state legal systems claim that it is up to the state to implement the eight kilometre rule and that they do not have the power to enforce this state law. However, the Fisheries Department Officials all claim that they do not have the power and resources to implement the state rules either.

1.8 FUTURE POTENTIAL FOR STRENGTHENING THE LEGAL PATTERN

The Fisheries Department of Andhra Pradesh has made proposals for Community-Based Fisheries Management (Krishnainah, 2004). Acknowledging the weakness of their own department, they believe that fisheries legislation cannot be implemented without community cooperation. At the same time, the fishers themselves acknowledge the limitations of their own legal systems.

The proposals will focus on the village and will give powers to locally appointed or elected ‘wardens’ to report those who do not comply. However, with the

exception of shore seines, the territory of fishing is not based on the village. Furthermore, it is hard to see how the wardens can have more influence and power than the caste elders or the elected boat owner association officers, if the scheme is to include the mechanised sector. Therefore, how another level of the legal pattern will help is not understood.

CHAPTER TWO: THE CONTEXT

Before discussing the core fishing problems, it is important to outline the context in which fishing activities take place in East Godavari District. The physical geographical characteristics of the district circumscribe the distribution of fishing modes and fishing castes. They also encourage other economic activities which compete for land and sea based resources which affect fishing activities.

Within this context, fishers and fishing are confronted with a complex set of problems. Frequently, it is assumed that the major economic problems for fishers are caused by: a) competition with other fishers and b) their practices which result in over-fishing and the subsequent decrease in stocks. The context of East Godavari illustrates that the problem of decreasing catches cannot be attributed solely to over-fishing. Rather, it also must be attributed to competing claims for coastal areas and water pollution by many diverse stakeholders.

In this chapter, a description of the physical geography, climate, and infra-structure will be made. This will be followed by an overview of the stakeholders: a) fishers classified by technological mode of fishing; b) government stakeholders; and c) other stakeholders who influence fishing. The purpose of the this chapter is to emphasize that fishing problems must be put into the wider context of competing claims for coastal areas and of pollution of fresh and marine waters.

2.1 PHYSICAL GEOGRAPHY OF EAST GODAVARI DISTRICT

East Godavari District lies between latitude 16 degrees 30’ and 18 degrees 20’ N and longitude 81 degrees 30’ and 82 degrees 36’ E. The district boundaries are: North: Visakhaptnam District and Orissa State; East: Bay of Bengal; West: West Godavari District; South: Bay of Bengal; and Northwest: Khamman District. (See Figures 2.1 and 2.2). The general elevation of district varies from a few meters near the sea to about 300 meters in the hills. The total area is 10, 807 sq. km divided among 1379 villages, with a total population of East Godavari District is 4,901,000, according to the 2001 Census (Government of Andhra Pradesh, 2001)..

The coast is 161 km long. The area of the continental shelf is 7571 sq. km. The coastal area can be divided into two zones: north of Kakinada is sandy, surf

beaten coast. The hinterland of this sandy coastal zone can be sub-divided into two agricultural zones. Between Kakinada and Ponnada, irrigated rice predominates. Further north, plantation crops, especially cashew, predominate. The second zone, south of Kakinada is the delta of the Godavari. The later can be subdivided into: a) the mangroves directly south of Kakinada; and b) drained delta south of Bhairavapalem.

> The Coringa mangrove reserve forest, the second largest (124 sq. km) mangrove ecosystem in the Indian sub-continent in Kakinada-Godavari estuarine area […] is subject to considerable human impingement recently owing to agriculture practices (paddy), industrial development (fertilizer factory), port expansion episodes, etc. Furthermore, the human impact through mangrove denudation for coastal aquaculture has now become a serious problem in Coringa (Satayanrayan et.al. 2002: 25).

The total mangrove complex covers a total area of approximately 333 sq. km, from Kakinada Bay to Bharaivapalem in the south. (ibid. 26). 'In 1978, the Government of Andhra Pradesh declared the whole region as Coringa Wildlife Sanctuary' (ibid. 26). The drained southern part of the delta is rich agricultural land where irrigated rice is dominant. In the centre of district lies Kakinada, the major town on the coast and District headquarters.

Fishing in East Godavari District is shaped largely by its physical geography which sub-divides the district into two ecological zones. This is evident from the development of different modes of fishing and the distribution of castes specialising in these different modes. South of Kakinada is the Godavari River Delta. The northern part of the delta is mangroves which drain into Kakinada Bay, enclosed by the sand spit of Hope Island. This ecological zone is dominated by the Agnikula Kshatriya caste who are traditionally river fishers. Increasingly, members of the Agnikula Kshatriya use small wooden crafts and rafts to fish in Kakinada Bay. All the mechanised boats using trawling gear owned by fisher castes are Agnikula Kshatriya who have migrated predominately to Yetimoga on the outskirts of Kakinada.

Figure 2.1 Map of India

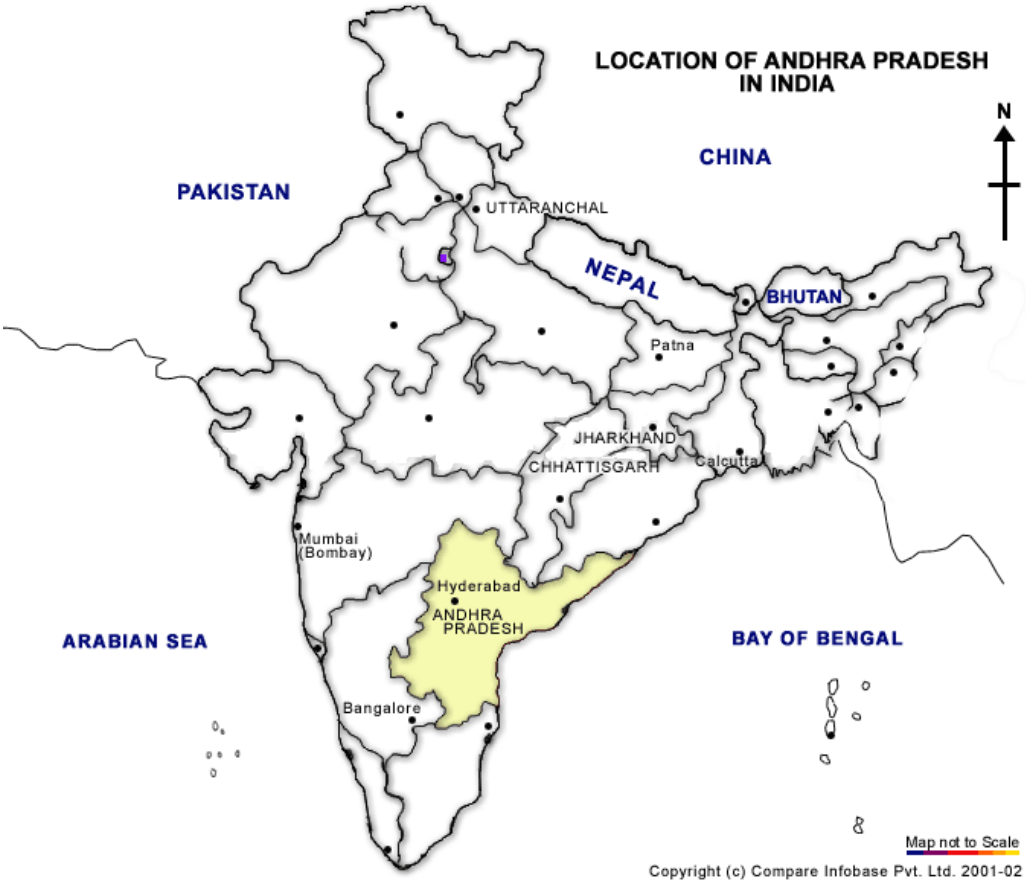
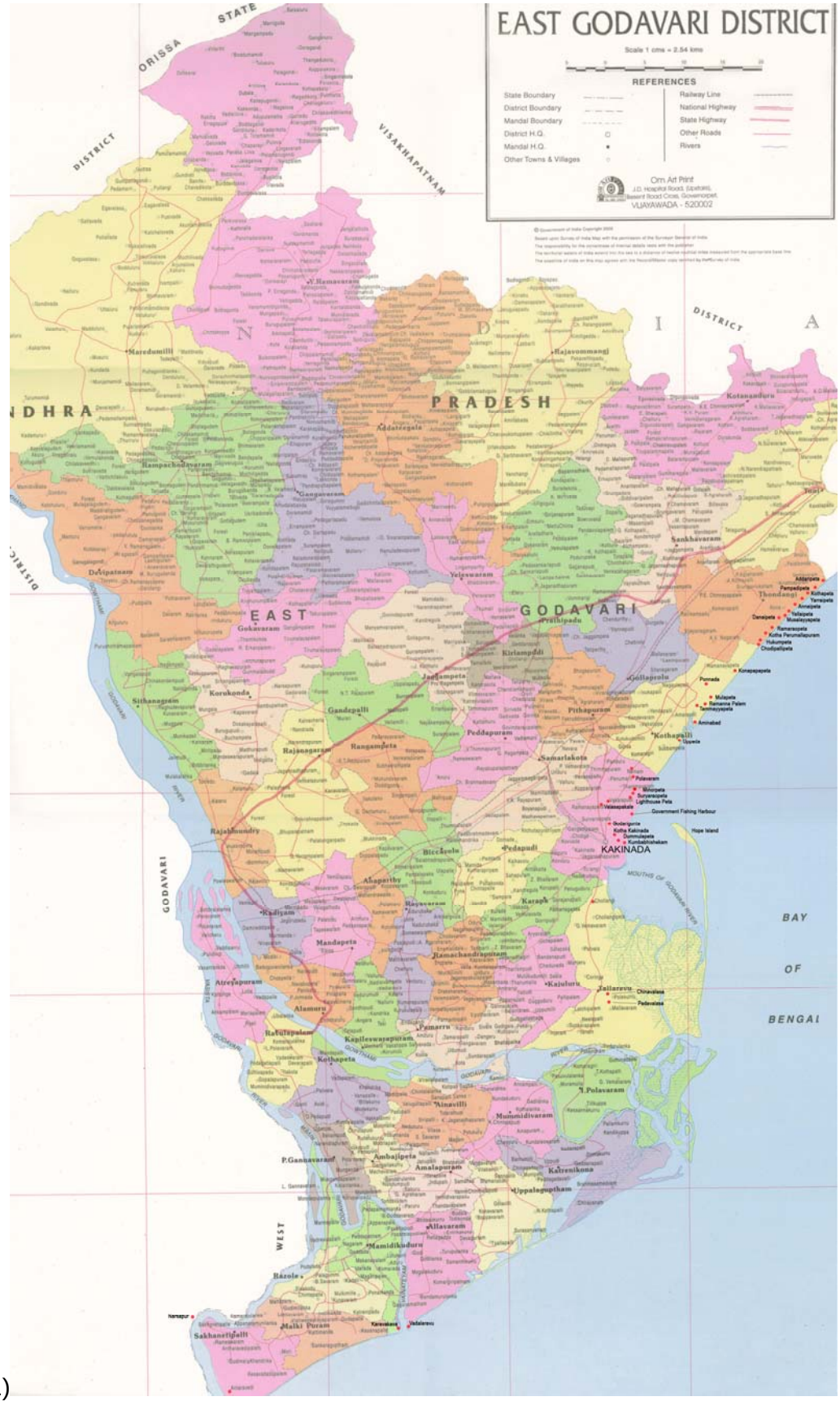


Figure 2.2 Map of Andhra Pradesh

Figure 2.3. Map of East Godavari District (see below)

21)


EAST GODAVARI DISTRICT
Scale 1 cms = 2.54 kms
REFERENCES
State Boundary
District Boundary
Mandal Boundary
District H.Q.
Mandal H.Q.
Other Towns & Villages
Railway Line
National Highway
State Highway
Other Roads
Rivers
Om Art Print
J.D. Hospital Road, Siyaram,
Beesant Road Cross, Governorpet,
VIJAYAWADA - 520002
ORISSA STATE
VISAKHAPATNAM DISTRICT
PRADESH
DISTRICT
EAST GODAVARI
WEST GODAVARI
KAKINADA
BAY OF BENGAL
MOUTHS OF GODAVARI RIVER
Government Fishing Harbour
Hope Island

North of Kakinada, the coast is inhabited predominately by the traditional marine fisher caste, Vadabalijas. The coast is characterized by sandy beaches, a wide continental shelf, a sandy bottom, and rough surf. The small Agnikula Kshatriya population north of Kakinada fishes in the rivers and creeks or uses cast nets to fish from the shore.(See Figure 2.5).

The geography of East Godavari also has contributed to the development of other stakeholders which have an impact on fisheries. The northern coast near Konapapapeta was ear marked by the government for shrimp hatchery development because of its unpolluted waters. The view of many fishers is that the hatcheries impede shore line territory for fishing activities, compete for marine shrimp markets, and pollute coastal waters. In the south, the Godavari delta has been drained and is one of the most important irrigated rice producing areas of India; this has also contributed to decreasing fishing territories and pollution. In the centre of the district, the harbours at Kakinada are protected by a sand spit, Hope Island, which has created Kakinada Bay. The harbours are a central place for fish marketing, as well as a transport hub for industries.

Kakinada is a fast-growing hub of industrial, agricultural and aqua-cultural development activities which affect fisheries. Rapid industrialization is being developed around Kakinada. From the perspective of fishing and shrimp hatcheries, it may seem ironic that the Andhra Pradesh Government has been attracted to the relatively unpolluted waters off the northern coast to develop an industrial corridor, with particular emphasis on pharmaceuticals (the most potentially damaging to fish stocks), between Kakinada and Visakhapatnam.

A deep water port has been opened in competition with the existing cargo port. The increasing traffic in shipping lines, particularly in Kakinada Bay, and the dredging of the sea bed, have influenced the ecology of the bay and are an inconvenience to fishers. Gas exploration and tapping near the Godavari Delta and plans to create a hydro-carbon port at Kakinada are a further threat to fishing.

In addition to the hazards of industrial pollution, the problem is compounded by pollution from agriculture and aqua culture. Extensive drainage and irrigation work was completed in the nineteenth century in the southern delta. During the last ten years, irrigation projects north of Kakinada, near Uppada, were extended to enable intensive agricultural techniques with the consequence of increasing water pollution. In addition, during the 1990s, there was intensive development of aqua culture ponds

in the district, particularly in the mangroves. In response to the demand for wild shrimp seed, a major source of livelihood for fishers throughout the district has been shrimp seed capture. The majority of the catch in seed nets is fish fry which are left to die; and hence, this is a major factor in stock depletion. Another response was the development of shrimp hatcheries to supply the aqua culturalists with shrimp seed raised from wild brooders. Since 1993, 72 hatcheries have been built between Konapapapeta and the northern border of the district. 62 were in operation in 2004. The majority are near in Konapapapeta. (See Figure 2.6).

In addition, Yanam, one of the regions in the Union Territory of Pondicherry, is bounded on all sides by East Godavari District, and lies on the opposite bank of the Godavari River from Bhairavapalem. It covers an area of 30 square miles and has a population of 31,362 according to the 2001 census. 8800 are included in the fisheries population, of which 1800 are active fishermen (cf. yanam.nic.in). There are three marine fishing villages, and 10 inland fishing villages. It has a fishing port and is a fast growing industrial hub (cf. www.thehindubusinessline.com).

Figure 2.4 Map of Northern Coastal Fishing Villages of East Godavari District

Figure 2.5 Caste Distribution

2.2 CLIMATE

Fishing practices and catches are affected by the pattern of the monsoon. Cyclones are a regular occurrence along the coast, particularly between October and November. Fear of cyclones affects fishing strategies with regard to the selection of fishing mode and location. The cyclone of November, 1996, has scarred the memories of most fishers since it killed over 1400 fishermen in East Godavari District.

Out of the 400 strong Kakinada-based fleet of motorised boats, 110 were lost at sea along with 569 crew members. Most of them had sailed several days before the cyclone to fish along the coast to the north and south of Kakinada, though not beyond the 70-fathom line (typically 35 km offshore and well within the range of All India Radio transmissions).

According the department of Fisheries, of the 1,435 fishermen dead or missing (presumed dead) in Kakindada, Rajamundry and Amalapuram Division of East Godavari District, 830 were killed by the storm surge while fishing shrimp seed on the beaches of the Godavari estuary, far from their villages and from any possible shelter. The two worst affected villages were Bhairavapalem and Balusutippa [both in the mangroves] (ILO 2000).

2.3 TRANSPORTATION INFRA-STRUCTURE

The coastal road north of Kakinada was built during last 20 years. This has had a great impact on fresh fish sales, types of processing, and marketing patterns for villages north of Kakinada. Widening of National Highway (N 5) near Kakinada will improve transportation further. The road network in the mangroves south of Kakinada is skeletal. A new bridge across the Godavari River connecting Yanam to rest of district has had a dramatic effect, cutting 70 km off the journey to Kakinada.

The district is served by Rail line (broad gauge) double line from Rajahmundry to Tuni and single line from Kakinada to Samalkota. Hence there is more dependence on road transport. However, there is a new rail line to the deep-water port.

The existing Kakinada Port is being superseded by the development of the Kakinada Deep-water port. Developed with Asian Development Bank assistance commissioned in 1997. ‘The deep-water Port is created by taking advantage of the

natural protection afforded by a sand pit (Hope Island) and by constructing a shore island breakwater of 1050 m length. A tranquil basin of about 100 sq. km has been created' (Exim India, 2000-01). In addition to importing food products for processing in industrial plants in Kakinada, the port will help to under girdle heavy industrialization in areas such as steel manufacturing. Most alarming for fishing is the proposed development of a world class port-based hydrocarbon terminal on par with those available in Singapore and Rotterdam (The Hindu, 20 Dec. 2001).

According to many fishers interviewed, dredging for the port has disturbed the fishing. There also is scientific evidence that the dredging has affected the ecology of Kakinada which has adversely affected the fish stocks.

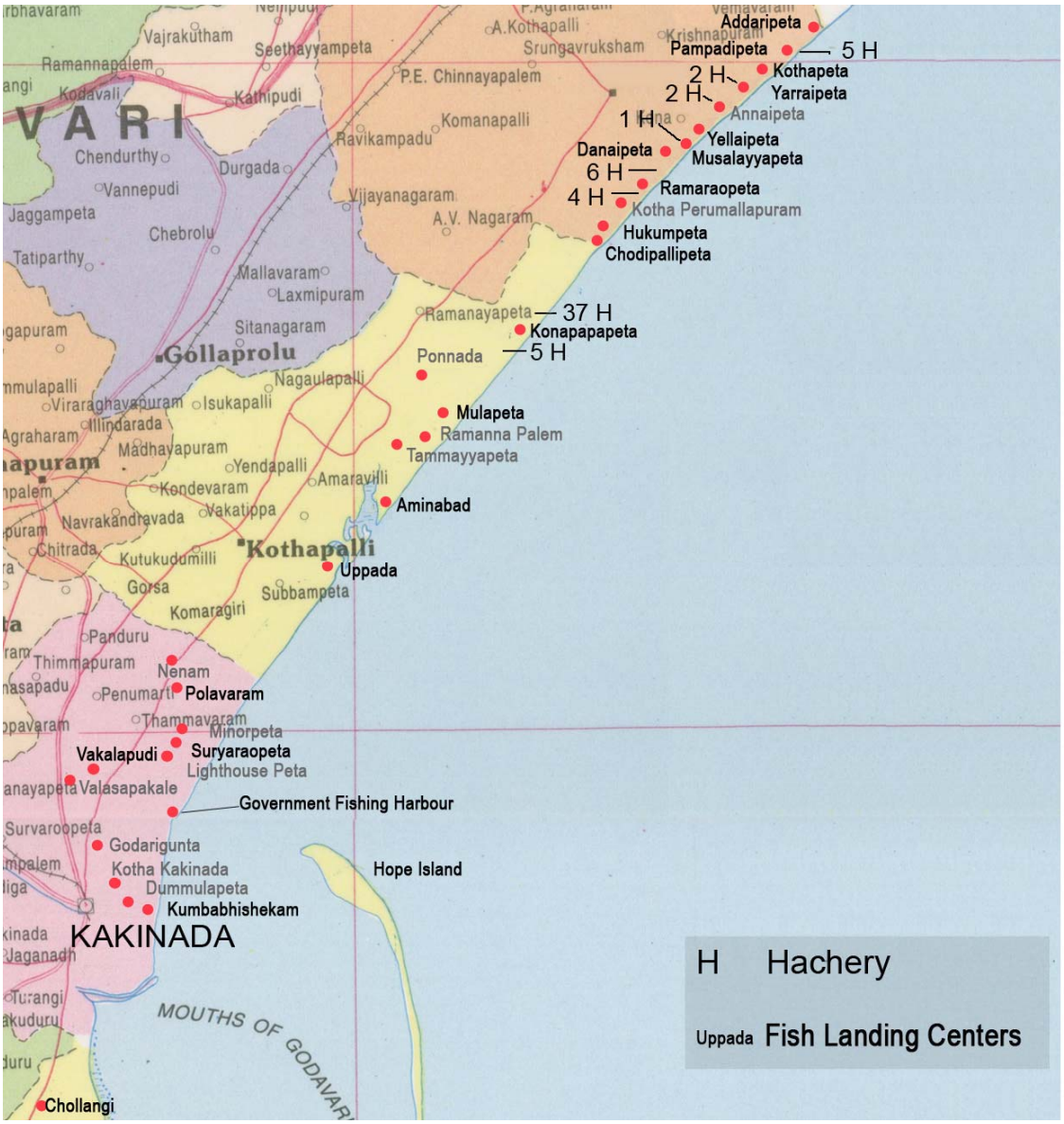
2.4 FISH LANDING CENTRES

The majority of fish caught by the artisanal sector are sold in one of the 46 fish landing centres based in fishermen villages. Figure 2.6 illustrates the distribution of the 19 fish landing centres in the study area. The high value fish is often re-sold at the government fishing harbour or at local village markets. The lower value fish is mostly dried and sold as poultry feed.

The **traditional fishing harbour** at Kakinada, Kumbabhishekam, is used mostly by artisanal boats (motorised and non-motorised) and rafts. Fish are unloaded from boats in shallow water and carried to shore in baskets. Most come to the harbour in the early morning to sell catch caught during night. Fish sold there tend to be high value species which are bought by agents who represent national and international markets in the major cities along the east coast, as well as Kerala. In addition to the national and international markets, fish also is bought by local traders who sell the fish in local markets in Kakinada or in hinter villages.

The **Government Fishing Harbour** in Kakinada was built for mechanized boats, and some motorized boats, to moor and unload their catches. Major landing time begins in the early afternoon. High quality species sold to traders at local fish landing centres are resold at the Government Fishing Harbour; or if large numbers are caught, the fish may be sold directly at the harbour by the fishermen. There are additional fishing harbours at Bhairapalem and Yanam in the southern part of the district for mechanised boats.

Figure 2.6 Map of Distribution of Hatcheries and Fish Landing Centres



2.5 AMENITIES

East Godavari District is relatively well endowed with educational facilities. There are a number of government hostels for scheduled castes and backward castes. However the literacy rates for fishers si said by fishers and officials to be relatively low. This is notably the case with regard to tertiary education.

Health facilities are reasonably good. Kakinada has a state medical college. In addition to the government hospital, there are several private hospitals in Kakinada. There are primary health care units throughout the district.

2.6 STAKEHOLDERS INVOLVED IN FISHING ACTIVITIES

The AP Marine Fishing Regulations Act, 1995, cite the following classes of vessels:

1. Mechanised fishing vessels above 25 gross tones or above 15 metres OAL
2. Mechanised fishing vessels up to 15 metres OAL (48.75 feet).
3. B.L.C.s and other motorized craft
4. Crafts above 8.5 metres using sail and oars
5. Country crafts up to 8.5 metres without sail and oars

These categories and those suggested in the IDPAD Handbook are not sufficient for this report, as it applies to the East Godavari District of Andhra Pradesh. Therefore, definitions specific to the research location are made. In Table 2.1 and 2.2 the distribution of modes of marine fishing based in Kakinada and in the villages north of Kakinada is made. A summary is given in Table 2.3. This area coincides with the Kakinada Division of the Fisheries Department.

2.6.1 Industrial Trawlers

This is the first category of the Fishing Regulations Act. None are based in East Godavari District. However, according to one President of a boat owners' association in Kakinada, these trawlers are catching lots of quality fish. They are at sea for 3-4 months. They are all foreign boats; they go to their own ports, not to local

ports. They clean and freeze fish on board. In 2002, his association complained that they were fishing within the 200 km EEZ. These big boats do not use trawl nets. Rather they use a ring net with a diameter of 15-20 km. The president perceived no problems with the nets of industrial trawlers and their own nets as they are fishing in different territories, for the most part. Nonetheless, industrial trawlers are perceived by other fishermen to be reducing fish stocks.

Table 2.1 Villages North of Kakinada

Village (some are aggregated hamlets)	Fisher Pop.	SS	Kak. nava	Rafts	Kattla teppas	Karra teppa	Fiber teppa	FET	BLC FE boat	Mec h. Boat
Addaripeta	1500	-	-	-	10	-	10	40	-	-
Pampadipeta	400	3	-	-	1	10	-	23	-	-
Kothapeta	800	-	-	-	3	30	-	50	-	-
Annayyapeta	100	-	-	-	-	-	-	-	-	-
Yarraipeta	800	-	-	-	-	100	30	5	-	-
Yellaipeta	2000	4	-	-	2	1	-	30	-	-
Patha Musalayyapeta	300	-	-	-	-	3	-	20	-	-
Vada musalayyapeta	400	-	-	-	2	5	-	-	-	-
Danaipeta	4000	3	-	-	6	20	-	40	-	-
P. Perumallapuram	300	-	-	-	-	-	-	7	-	-
Ramaraopeta	700	1	-	-	6	1	-	-	-	-
Kottapeta	500	2	-	-	-	4	20	5	-	-
KottaPerumallapuram	550	4	-	-	-	4	5	10	-	-
Hukumpeta	1200	2	-	-	-	-	4	11	-	-
Chodipallipeta	1000	3	-	-	6	-	6	10	-	-
Antarvedipeta		-	-	-	-	-	-	-	-	-
Konapapapeta	200	-	-	-	-	-	-	1	-	-
Kuppirivanipeta	4000	7	-	-	-	-	70	25	-	-
Ponnada AK	500	-	-	60	-	-	-	-	-	-
Ramanna palem AK	250	-	-	70	-	-	-	-	-	-
Mulapeta	1700	15	8	12	2	-	13	-	-	-
Tammayyapeta AK	200	-	-	30	-	-	-	1	-	-
Ameenabad	4000	3	-	-	-	3	80	5	-	-
Uppada										
Mayapatnam Uppada	3000	1	-	-	-	-	20	-	30	-
Ramasettipeta	1500	-	-	-	-	-	50	6	15	-
Suradapeta Uppada	1000	-	-	-	-	-	2	4	22	-
Jaggarajupeta	2000	-	-	-	-	-	-	4	20	-
Nayackar Colony	3000	1	-	-	-	4	40	5	50	-
Subbampeta Uppada	700	6	-	-	-	20	10	35	-	-
S. Kothamatnam	500	-	-	-	-	20	-	25	-	-
Rangunuoatham	300	-	-	-	-	-	-	10	-	-
Neman AK	300	-	-	50	-	-	-	-	-	-
Polavaram AK	500	-	-	150	-	3	-	-	-	-
Suryaraopeta	6000	7	25	-	-	-	-	30	-	-
Minorpeta	600	1	30	-	-	-	-	3	-	-

Vakalapudi	2000	6	20	-	-	20	2	-	-	-
Valasapakala AK	400	-	-	-	-	-	2	-	-	-
Lighthouse Peta	600	-	30	10	-	-	-	8	-	-
Pagadalapeta	2000	-	100	-	-	-	-	25	-	-
New Fishing Harbour	1000	-	30	-	-	-	-	5	-	-
Kondelupeta	1000	-	40	-	-	-	-	-	3	-
Godarigunta	500	-	15	-	-	-	-	-	8	-
Santanapudi Colony	1200	-	-	80	-	-	-	-	-	-
Kotha Kakinada	5000	1	200	-	-	-	-	-	-	1
Dummulapeta	12,000	16	300	-	-	-	16	150	250	-
Parlopeta VB+Jalari	3000	-	5	-	-	-	-	20	50	4
Fraserpeta ak	2000	-	5	-	-	-	-	4	-	-
Bustand Peta AK	800	-	80	20	-	-	-	-	-	-
Yetimoga AK	20,000	17	100	-	-	-	-	-	400	600
Hope Island	250	3	-	-	-	-	-	-	4	-
South of Kakinada**										131
TOTAL	**92,350**	**106**	**988**	**482**	**36**	**247**	**380**	**617**	**852**	**736**

AK= Agnikula Kshatriya

Names not in bold type are hamlets

* Unknown although this village is the fisheries Department's list.

** Information about technologies south of Kakinada is not included, except for the mechanised boats.

Table 2.2 Villages North of Kakinada: A Summary of Technologies (number)

Village (some are aggregated hamlets)	Fisher Pop.	S.Seines + Marine navas	Kakinada navas	Rafts	Kattla teppas	Karra teppa	Fiber teppa	FET	BLC FE boat	Mech. Boat
Addaripeta	1500	-	-	-	10	-	10	40	-	-
Pampadipeta	400	3	-	-	1	10	-	23	-	-
Kothapeta	800	-	-	-	3	30	-	50	-	-
Annayyapeta	100	-	-	-	-	-	-	-	-	-
Yarraipeta	800	-	-	-	-	100	30	5	-	-
Yellaipeta	2000	4	-	-	2	1	-	30	-	-
Patha Musalayyapeta	300	-	-	-	-	3	-	20	-	-
Vada musalayyapeta	400	-	-	-	2	5	-	-	-	-
Danaipeta	4000	3	-	-	6	20	-	40	-	-
P. Perumallapuram	300	-	-	-	-	-	-	7	-	-
Ramaraopeta	700	1	-	-	6	1	-	-	-	-
Kottapeta	500	2	-	-	-	4	20	5	-	-
KottaPerumallapuram	550	4	-	-	-	4	5	10	-	-
Hukumpeta	1200	2	-	-	-	-	4	11	-	-
Chodipallipeta	1000	3	-	-	6	-	6	10	-	-
Konapapapeta	4200	7	-	-	-	-	70	26	-	-
Ponnada AK	500	-	-	60	-	-	-	-	-	-
Ramanna palem AK	250	-	-	70	-	-	-	-	-	-
Mulapeta	1700	15	8	12	2	-	13	-	-	-
Tammayyapeta AK	200	-	-	30	-	-	-	1	-	-
Ameenabad	4000	3	-	-	-	3	80	5	-	-
Uppada	12,000	8	-	-	-	46	122	89	137	-
Neman AK	300	-	-	50	-	-	-	-	-	-
Polavaram AK	500	-	-	150	-	3	-	-	-	-
Suryaraopeta	6000	7	25	-	-	-	-	30	-	-
Minorpeta	600	1	30	-	-	-	-	3	-	-
Vakalapudi	2000	6	20	-	-	20	2	-	-	-
Valasapakala AK	400	-	-	-	-	-	2	-	-	-

Lighthouse Peta	600	-	30	10	-	-	-	8	-	-
Pagadalapeta	2000	-	100	-	-	-	-	25	-	-
New Fishing Harbour	1000	-	30	-	-	-	-	5	-	-
Kondelupeta	1000	-	40	-	-	-	-	-	3	-
Godarigunta	500	-	15	-	-	-	-	-	8	-
Santanapudi Colony	1200	-	-	80	-	-	-	-	-	-
Kotha Kakinada	5000	1	200	-	-	-	-	-	-	1
Dummulapeta	12,000	16	300	-	-	-	16	150	250	-
Parlopeta VB+Jalari	3000	-	5	-	-	-	-	20	50	4
Fraserpeta ak	2000	-	5	-	-	-	-	4	-	-
Bustand Peta AK	800	-	80	20	-	-	-	-	-	-
Yetimoga AK	20,000	17	100	-	-	-	-	-	400	600
Hope Island	250	3	-	-	-	-	-	-	4	-
South of Kakinada	-	-	-	-	-	-	-	-	-	131
Total	**92,350**	**106**	**988**	**482**	**36**	**247**	**380**	**617**	**852**	**736**

AK = Agnikula Kshatriya

Table 2.3 Total Technologies in Villages North of Kakinada (number)

	Fisher pop.	S. Seines + Marine navas	Kakinada navas	Rafts	Kattla teppas	Karra teppa	Fiber teppa	FET	BLC FE Boat	Mech. Boat
Total	**92,350**	**106**	**988**	**482**	**36**	**247**	**380**	**617**	**852**	**605**

Table 2.4 Villages North of Kakinada: Number of fishers employed in different technologies.

Village (some are aggregated hamlets)	Fisher Pop.	S.Seines + Marine navas	Kakinada navas	Rafts	Kattla teppas	Karra teppa	Fiber teppa	FET	BLC FE boat	Mech. Boat
Addaripeta	1500	-	-	-	40	-		200	-	-
Pampadipeta	400	150	-	-	4	40	-	115	-	-
Kothapeta	800	-	-	-	12	120	-	250	-	-
Annayyapeta	100	-	-	-	-	-	-	-	-	-
Yarraipeta	800	-	-	-	-	400	120	25	-	-
Yellaipeta	2000	200	-	-	8	4	-	150	-	-
Patha Musalayyapeta	300	-	-	-	-	12	-	100	-	-
Vada musalayyapeta	400	-	-	-	8	20	-	-	-	-
Danaipeta	4000	150	-	-	24	80	-	200	-	-
P. Perumallapuram	300	-	-	-	-	-	-	35	-	-
Ramaraopeta	700	50	-	-	24	4	-	-	-	-
Kottapeta	500	100	-	-	-	16	80	25	-	-
KottaPerumallapuram	550	200	-	-	-	16	20	50	-	-
Hukumpeta	1200	100	-	-	-	-	16	55	-	-
Chodipallipeta	1000	150	-	-	24	-	24	50	-	-
Konapapapeta	4200	350	-	-	-	-	280	130	-	-
Ponnada AK	500	-	-	60	-	-	-	-	-	-
Ramanna palem AK	250	-	-	70	-	-	-	-	-	-
Mulapeta	1700	750	64	12	8	-	52	-	-	-
Tammayyapeta AK	200	-	-	30	-	-	-	5	-	-
Ameenabad	4000	150	-	-	-	12	320	25	-	-
Uppada	12,000	400	-	-	-	184	488	445	1370	-
Neman AK	300	-	-	50	-	-	-	-	-	-
Polavaram AK	500	-	-	150	-	12	-	-	-	-
Suryaraopeta	6000	350	200	-	-	-	-	150	-	-
Minorpeta	600	50	240	-	-	-	-	15	-	-
Vakalapudi	2000	300	160	-	-	80	8	-	-	-
Valasapakala AK	400	-	-	-	-	-	8	-	-	-

Lighthouse Peta	600	-	240	10	-	-	-	40	-	-
Pagadalapeta	2000	-	800	-	-	-	-	125	-	-
New Fishing Harbour	1000	-	240	-	-	-	-	25	-	-
Kondelupeta	1000	-	2000	-	-	-	-	-	30	-
Godarigunta	500	-	120	-	-	-	-	-	80	-
Santanapudi Colony	1200	-	-	80	-	-	-	-	-	-
Kotha Kakinada	5000	50	1600	-	-	-	-	-	-	9
Dummulapeta	12,000	800	2400	-	-	-	64	750	2500	-
Parlopeta VB+Jalari	3000	-	40	-	-	-	-	100	500	36
Fraserpeta ak	2000	-	40	-	-	-	-	20	-	-
Bustand Peta AK	800	-	640	20	-	-	-	-	-	-
Yetimoga AK	20,000	850	800	-	-	-	-	-	4000	5400
Hope Island	250	150	-	-	-	-	-	-	40	-
South of Kakinada	-	-	-	-	-	-	-	-	-	1179
Employed x tech.		**5,300**	**9,584**	**482**	**152**	**1,000**	**1,480**	**3,085**	**8,520**	**6,624**
Total Employed in Fishing										**36,227**

Note 1: Although the number crew varies, these are estimates based on the following number of crew in each technology:

Shore seine: 50 (30 crew plus 20 labourers)

Kakinada nava: 8 [Guess-estimate based on the river fishing in Mulapeta]

Karra teppa: 4

Kattla teppa: 4

Fibre teppa: 4

Raft: 1

BLC/FEB: 10

FET: 5

Mechanised boat: 9

Sona: 10

Under-resourced mechanised boat: 8

Note 2: Fishers often work in different types of fishing. Therefore, the figures may over estimate the number of active fishers.

2.6.2 Mechanised Boats (Category 2)

The boats operating from Kakinada Harbour are between nine and thirteen meters long, have a cabin and a mechanised lifting gear for trawl nets, designed to catch different species. For the purposes of this report, mechanised boats are divided into two types: the sona boats and the smaller mechanised boats. The more prosperous fishers have bought the larger, better equipped sona boats which often have GPS, sonar technology, and larger storage capacity for longer fishing trips. Most sona boats fish beyond the beyond the 23 km fishing zone. The smaller mechanised boats are relatively poorly equipped for longer trips; and more important for this report, their owners are unable to fish beyond the eight km fishing zone due to financial restraints.

Sona Boats

There are two types of sona boats at Kakinada: the Sona Boat with a 98 hp engine and between 36 and 38 feet in length. A slightly larger boat, the Dolphin Sona has a 108 hp engine and is 40 feet in length. Sona boat maintenance is high. The boats use nine litres of diesel per hour for 98 hp engines and 10 litres per hour for 101 hp engines. Good catches are required to maintain the boats. Therefore, they fish in deep sea. The larger boats can fish in open seas for ten to 15 days.

Smaller Mechanised Boats

These boats have shorter lengths and smaller engines than the sona boats: Pablo 65 hp, Royya 75 hp, Pomfret 75 hp, and Sorra 75 hp. They use five litres of diesel per hour for 65 hp engines. These small mechanized boats often fish near shore. They do not fish far out to sea because of their small storage capacity and the cost of diesel would make fishing for more than a day or two uneconomic. Another reason is that they cannot afford to maintain their boats well enough to fish far away from shore. Typically, these smaller boats wait for 10 hours to haul in their net, which is 800-1000 meters long.

2.6.3 Small-scale Fishers

Small-scale Motorised Boats:

Fibre Engine Boat and Beach Landing Craft (BLC): These boats have a slightly different shape. Both are fibre reinforced plastic boats with inboard motors, commonly 20 hp. In 1979-80, the Bay of Bengal Programme of FAO started developing a beach landing craft suitable for India's East Coast. Eight to ten meter long versions were widely adopted in the 1980s (Sarma, n.d.).

Fibre Engine teppa: This category includes fibre reinforced plastic boats with outboard motor. The traditional craft in this area are not suitable for motorization (Vivekanandan et.al. 1997: 26). The motor gives them the possibility to fish further out than the non-motorised boats.

Small-scale non-motorised boats:

Fibre teppa: These are Fibre Reinforced Plastic open sail boats, eight to ten metres long with polystyrene in its tanks. All of the teppa owners in one village, Mulapeta, say that they fish within about three kilometres of shore. From observation, this appears to be general for non-motorised fibre teppas.

Karra teppa[1]: Three to seven large logs tied together with a hollowed out section in the centre and with a slightly up-curved bow is a karra teppa. This boat can take three to four men. It is often referred to as a Kattumaru or kattumaran in the literature; but no informant knew it by this name.

Kattla teppa: This boat is constructed by stitching wood planks together and newer versions have polystyrene foam in the hull. The planks are often made from the logs of a karra teppa. Using planks, rather than logs, reduces the cost of timber (logs) used to construct a karra teppa.

Rafts: Three to five narrow logs (approximately ten centimetres in diameter) are tied together forming a flat platform, large enough for one man. The dimensions are 60-

100 centimetres wide and 150-200 centimetres long. Some Agnikula Kshatriya hoist a sail onto the raft and fish in Kakinada Bay. Most are used for river fishing. It costs about Rs. 2000 and lasts about two years.

Figure 2.7 Distribution of Technologies

Shore Seines and Navas

Shore seines are primarily used for marine fishing, although smaller nets can also be used for river fishing. The fishing area is circumscribed by the length of the net from the shore. Along the northern coast of East Godavari District, marine shore seines vary in length from 300 to 600 baralu. A *bara* is the span between finger tips of outstretched arms. Most informants told me it was equivalent to two meters; and a few said it was 1.5 meters. Established practice among Fisheries Department officials is that a *bara* is equal to a fathom which is six feet two inches or 1.85 meters.[2] During 2004, the length of nets in one village, Mulapeta, was between 450 and 600 baralu (833-1110 meters). A rope of 400 baralu is attached to one end of the net and a rope of 600 baralu on the other end. The difference in length allows the net to be laid on a diagonal from the shore. Thus, the total length is about 3000 meters, which requires over three hours for fifty men to pull it into shore. Each rope is extended another 1000 meters to catch some species, e.g. anchovies; this requires about five hours to pull in the five kilometre net.

Unlike many shore seines, those used in the research site are a flat, elongated net, without a pouch or bag. As the net is pulled in, a pouch is formed by the weight of the fish. The dimensions of one net that was measured are: length: 925 meters (500 baralu); width in the centre: 24.6 meters, tapering to 7.3 meters at the ends. In the centre section which was 13.2 meters long and 24.6 meters wide, eight millimetre mesh was used.

All nets are made from white multifilament (nylon) twine since the mid 1980s. The body of the shore seine is made with 2/3 ply twine; and 3/3 ply twine along the edges of about forty-five centimetres at the top and bottom. A combination of five or six mesh sizes, from eight to thirty-two millimetres, are used. The smallest mesh size is in the centre. However, different makers use only some of these different sizes. All have eight or ten millimetre mesh at the centre, and most have larger mesh sizes up to twenty-six millimetre at ends, although some reported using thirty-two millimetre mesh. The sequence of mesh starting from the centre is always from smaller to larger—some sizes are not used depending on availability. The weight of the net is about 500 kg.

Ropes are attached to the top and bottom of the net, each weighing 500 kg. Polystyrene floats are attached to the top of the net, and weights are attached to the

bottom. The total weight of the shore seine is approximately 2500 kg, plus the weight of the sinkers. The size and weight of the new nylon nets required larger boats to lay the net.

Nava: A small plank boat, the kattla teppa or padava, was used with the cotton shore seine. Too small for the larger nylon net, it has been replaced by the nava. The nava is 9-12 meters long (BOBP 1983: 3), crescent shaped, plank built, row boat. Out of water, at the ends of the boat, its bottom is about two meters off the ground. The weight of the boat with the net makes rowing the boat through the surf an arduous task for a crew of about 25. Previously it was made of teak and had a service life of approximately ten years (BOBP 1983: 3). Today, the nava is made with less durable wood. The recurrent costs for repairs are considerable after three years, when shore seine owners who can afford it replace them. (cf. Southwold 2005 for details of construction and recurrent costs).

Kakinada Nava

A smaller (four to five metres)[3] version of the *nava*, the *Kakinada nava*, is used for river/creek fishing, and some are used in the sheltered Kakinada Bay, often with a sail. Some informants, including boat makers, said it was the same as the marine nava, only built in smaller proportions. However, the Kakinada nava does not have the accentuated crescent shape characteristic of the marine nava.

……..

There is tremendous diversity in the nets and crafts used for fishing by both castes living north of Kakinada. Sarma (n.d.) reports that by 1975-80 species-specific nets began to be increasingly used in AP. However, the adoption and transformation of technologies is a dynamic, continuous process. Each gear owner has his own ideas about how to improve the construction of his net or boat, although the overall dimensions may remain similar. From season to season, fishers adopt different technologies to catch different species, often in different locations.

These seasonal fluctuations are compounded by changes in ownership. From year to year, the numbers of boats and nets change as the financial circumstances of fishing gear owners change, most frequently being sold to fishers in other villages. In

Table 2.1, an estimate of the types of fishing vessels used by fishers north of Kakinada is presented. These estimates are based on information given by several respondents in each village. The wide variation in answers that were given, at least in part, reflects the seasonal and annual changes in ownership. The guess-estimates of informants whose general information seemed most reliable were used. Counting the boats was not possible because many were absent, either for daily fishing or for migration. The data from the Fisheries Department was not reliable either due to the large number of boats that were not registered, according to the fishers' own accounts. In fact, the Fisheries Department's most recent data are not based on registration but on survey data. Accurate data, therefore, is not possible, although the estimates give a reasonable overview of trends[4.]

In Table 2.2, the data for hamlets within a village have been aggregated. There is a distance of approximately 55 kilometres between Kakinada and the northern border of the district. The villages are ordered from north to south. To simplify the information, data for hamlets that are part of the same village have been aggregated. All of the rafts are in Agnikula Kshatriya villages. Most of the mechanised boats are based in Yetimoga, a neighbourhood of Kakinada, or in another harbour south of Kakinada, Bhairavapalem. Likewise there are no beach landing crafts or fibre engine boats further north than Uppada. Most striking is that there are no fibre engine teppas in Mulapeta, which has the largest number of shore seines both in absolute numbers and in proportion to population. The two exceptions are Dummulapeta and Yetimoga which have the two largest populations of fishers (12,000 and 20,000 respectively) and the largest number of BLCs and mechanised boats.

According to the Marine Fisheries Information Service, in 1981, there were 284 shore seines in East Godavari (BOBP 1983: 23). This represents a dramatic decrease in the number today of 106[5.] According to the same report, there were only 113 mechanised boats in East Godavari (ibid. 22), while today there are 736, including the mechanised boats south of Kakinada. Unfortunately, I do not have comparative data for this period on non-mechanised boats. However, the data does suggest dramatic changes in technologies during the last thirty years. Based on career histories of fishers in all fishing sectors, there has been a swing away from motorised technologies during the last 15 years (Southwold 2005).

2.7 GOVERNMENT STAKEHOLDERS

2.7.1 Fisheries Department

The Fisheries Department has a contradictory role to both stimulate fish production and to protect fishing stocks. It has stimulated fish production by introducing and subsidizing the adoption of new technologies, especially in the mechanised sector. In addition to loan schemes for buying increasingly larger mechanised boats, there are training courses for mechanised boat drivers, loans for new boats, subsidies for GPS, sonar and VHS sets. Similarly the small-scale sector has been encouraged with loan schemes to adopt new technologies such as motorised boats, and nylon nets.

Government policies to introduce new technologies have the effect of diversifying technologies and diversifying fishing territories. The state has taken an active role in encouraging the adoption of all new technologies through various loan schemes and subsidies, often administered through organisations such as the Fishermen's Cooperative Society. The officers of these organisations tend to be caste leaders, who control the distribution of grants.

The adoption of motorised boats has been encouraged by the state of Andhra Pradesh. The FAO sponsored Bay of Bengal Programme has given incentives for the adoption of BLCs in Uppada and a few other villages closer to Kakinada. In 1992, the BOBP introduced IND 20, BLC with 10 hp engines in order that fishermen could reach pelagic fishing grounds further out to sea. In 1995, IND 20 was stopped. Only 33 ft craft with a 20 hp engine are now available. The aim is to enable exploration of deeper waters for pelagic fish.

The subsidy schemes for diesel have been changed several times during 2004-5. A new increase was announced in October, 2005. 'Mr. Sundar Kumar [the new commissioner of the AP Department of Fisheries] said the Government was allowing a subsidy of Rs. 5.50 on each litre of diesel supplied to the fishermen and the limit has been 300 litres per each out-board boat per month and 3,000 litres per each mechanized boat' (The Hindu, 24 October, 2005).

Information about schemes supported by the Fisheries Department is disseminated in meetings at fishermen villages, as well as through local offices in the district where information about the location of fish is posted.

In Chapter Three, their role in the protection of fishing stocks will be presented. Another major role is in fishermen's welfare. There is a savings relief scheme during the seasonal annual ban on fishing, as well as insurance schemes. The Velugu Programme is a World Bank supported project in Andhra Pradesh which targets the poorest, most vulnerable communities. In East Godavari District, it is working in close collaboration with the Fisheries Department and has targeted development of 77 fishermen villages.

The most important fact to note about the AP Fisheries Department is that it is under-funded and under-appreciated. It simply does not have the funds to implement legislation or to carry out its work to the standards that their staff attempt to achieve.

2.7.2 State Institute for Fishing Technology

There are two institutes for fishing technology in AP: one in Kakinada and the other in Machilipatnam. It provides training classes for 75 students with a minimum education of 7th class. The subjects are gear operation (net operating, repairs, assembling nets, mounting tag with ropes), navigation (driving, rules of the road at sea, fishing time), and engine mechanism. Trained candidates obtain a driver's license.

2.7.3 Research Institutes

Central Marine Fisheries Research Institute, State Institute for Fishing Technology, and the M.S. Swaminathan Research Foundation all have offices in Kakinada and research on the marine ecology.

2.7.4 Pollution Control Board

The Pollution Control Board is supported by good legislation and facilities. Repeatedly I was told that there were problems of political influence on its decisions and capacity of implementation.

2.7.5 Industrial Development Agencies

There is a major push from the AP government for industrial development, particularly in coastal areas. The proposed industrial corridor between Bhimili (north of Visakhapatnam) and Kakinada is the first phase of the state's development programme.

2.8 OTHER STAKESHOLDERS WHO INFLUENCE FISHING

2.8.1 Industry

Existing industrial development around Rajumundry creates serious pollution problems for the Godavari River. Discharge from one polluter, destroys the fish in the Delta for several weeks, every time it makes a discharge, according to my informants living near the mangroves.

Kakinada is a growing hub for industry in East Godavari District. For example, a mega steel unit is to be built in Kakinada by the Essar Group (Chandrakanth 2005). In addition to land acquired for development around the city, 5000 out of a total of 6230 hectares have been identified for new industrial development in Ponnada, Ramankkapeta, AV Nagram and Kona (Naik 2004). Most of these areas are close to the coast north of Kakinada.

2.8.2 Oil and Gas

There is exploration and tapping of oil and gas off shore, near the Godavari estuaries. Hence, there are plans to make Kakinada a major carbon terminal. According to a report in Frontline:

> The Krishna-Godavari basin, with a very high production potential, is one of ONGC's premier basins in the country today. The KG basin extends over 28,000 sq. km onland, 24,000 sq. km in 'shallow' (by current definition, a depth of up to 400 meters) waters offshore and 18,000 sq. km in deep waters (a depth of up to 2,000 metres). ONGC

> began prospecting for oil and gas in the basin in April 1977 […] Oil production in the basin has gone up by an order of 10 in the last 10 years – from 0.03 million tones to 0.29 million tones a year. So far ONGC has produced one million tones of oil and about 11 billion cubic metres of gas here (Subramanian, 2003: 1, 3).

The Reliance Gas rigs near Gadimoga prevent shore fishing. Local fishermen state that many marine gill nets have been damaged by oil rigs and that the oil companies give no compensation. Of greater concern is the potential for ecological degradation, particularly with regard to fishing.

2.8.3 Aqua Culture and Shrimp Hatcheries

During the 1990s, there was intensive development of aqua culture ponds in the district, particularly in the mangroves. In response to the demand for wild shrimp seed, a major source of livelihood for fishers has been shrimp seed capture. The seed net used is a fine mesh (like a mosquito net) supported by a small frame. The majority of the catch in seed nets is fish fry which are left to die and hence this is a major factor in stock depletion. Another response was the development of shrimp hatcheries to supply the aqua culturalists with shrimp seed raised from wild brooders. The largest number of hatcheries in Andhra Pradesh is located in East Godavari District. Since 1993, 72 hatcheries have been built between Konapapapeta and the northern border of the district. 62 were in operation in 2004. 37 are in Konapapapeta (See Figure 2.6).

Aqua culture ponds are throughout the district, and most prominent in the mangroves. Many of the later are controlled by local fishing communities; however, the majority are small scale agriculturalists with less than five acres. In the northern part of the district, most have been developed by outside investors.

Both hatcheries and aqua culture require high investment to be viable. Therefore, sustainable hatcheries and aqua culturalists tend to be non-local investors with money, and well educated staff. Nevertheless, this is a sector of fishing that is under going a financial crisis, largely precipitated by the white spot virus, and the glut of shrimp on the world market.

For marine fishers, both create a number of problems in addition to competition and over-production which reduces the price of wild shrimp. The hatcheries disturb the shore access and their pipes can damage nets. Further, some argue that the levels of anti-biotics and pollution are disturbing shrimp breeding.

2.8.4 Farming

East Godavari District is one of the highest yielding rice producing areas in India. There has been intensive irrigation based on the Godavari since the 19th century. New irrigation works have been opened north of Kakinada in recent years which are another source of pollution which is damaging the fish population. This pattern will intensify. According the K.S. Jawahar Reddy, the District Collector:

> East Godavari is going to witness another Green Revolution with all the major, medium and minor irrigation projects taking shape. It is poised for another cotton era. While Sir Arthur Cotton could bring four and a half lakh acres in East Godavari under cultivation through the Dowlaswaram anicut, now over three lakh acres are going to be added during the next 10 year period under the new irrigation projects (Madhusudhana Rao, 2004: 1).

2.8.5 Tourism

There is little international tourism although there is some in the Coringa Mangroves. A number of AP tourism projects are proposed. Some of them are a good example of the lack of coordination in planning use: Uppada handloom centre (a major fishing village in the district); Vakalapudi Beach (near major industrialization and the proposed location of a ship breaking yard which has been heartily opposed by many factions); Hope Island (the outer border of Kakinada Bay where there is a deep water port); and Allavaram Beach (near oil and gas drills).

CHAPTER THREE: CORE FISHING PROBLEMS

In Andhra Pradesh, as elsewhere in the world, fisheries are in crisis. The major concern of the fishers themselves is that their income from fishing is declining. The decline in incomes can be attributed to three causes. The first is the decrease in fish stocks caused by pollution and over-fishing. The second is their increasing costs, particularly with regard to fuel costs. And the third is the decreasing prices which may be due to a glut in the international market of certain commodities, such as shrimp, through the over-production of aqua culture. The fishers' perception of the reasons for their declining incomes places different emphases on the identification of core problems. The response of fishers to their declining income has led to increasing competition over fishing territories at all levels of fishing (especially in inshore territorial waters), changing migration patterns and the down scaling of fishing technologies. Another consequence has been the decreasing effectiveness of the non-state legal systems to enforce their own rules, as well as those of the state legal system. This will be described at length in following chapter.

The response of the government has been the introduction of legislation to address some these problems, such as the Fisheries Regulation Act, the Ban on Seed Nets, the Coastal Zone Regulation Act. In addition, the Pollution Control Board has powers to regulate pollution. And furthermore, the Fisheries Department, often in conjunction with other agencies, has a number of projects to improve the welfare of fishers, as well as subsidies for fishing boats, nets, and fuel. Chapter Five will describe the state legal system and its capacity to enforce government legislation.

The core problems are presented in Table 3.1 below. The first ten problems are ranked according to the importance given to the problem by fishermen interviewed. A comparison between fishers' perceptions of these problems and those of government officials in the Fisheries Department show almost complete agreement. Some of the core problems identified are causes of decreasing incomes, others are responses to decreasing incomes which further aggravate decreasing incomes.

The convergence of the perceptions of the core fishing problems raises a central issue of this report. If fishers and government officials perceive that the core fishing problems are the same, why is the legal pattern (composed of the non-state

legal systems and the state legal systems) insufficient to solve these core fishing problems? This question will be addressed in the following chapters. In this chapter, the core fishing problems will be presented. This will be followed by an overview of the responses to these problems by fishers and by the Fisheries Department.

Table 3.1 Core Fishing Problems

Core Fishing Problems	Fishers	Officials
1. Declining incomes	X	x
2. Competition in near shore fishing territory	x	x
3. Cost of fuel	x	x
4. Decreasing stocks	x	x
5. Wild shrimp seed collection	x	x
6. Inability of Fisheries Department to enforce legislation	x	x
7. Fishers' lack of political power	x	x
8. Industrial pollution	x	x
9. Hatchery pollution	x	
10. Agricultural pollution	x	
11. Mesh size of nets		x
12. Primarily target tiger shrimp		x
13. Lack of diversification of crafts		x
14. Minimum support price needed		x
15. Fisher elders sell out to: industrial interests, oil		x

3.1 DECLINING INCOMES

All fishers, in all fishing modes, complain that their incomes are declining. Fishers claim that this is in part due to their declining catches. The veracity of the evidence of this claim will be discussed in the following section. What is most interesting with regard to the interaction between the legal systems is that fishers tend to blame fishers using different technologies in the same fishing territory as the

main reason for their declining catches. In other words, competition for in-shore fishing territory is one of the first core fishing problems mentioned by fishermen. Consequently, the small mechanised boats blame the larger mechanised boats for catching 'their' fish. Similarly, small-scale fishers blame the mechanised boats. And the non-motorised boats blame the motorised boats for ruining their catches.

It is also interesting to note that only mechanised boat fishermen, especially those with sona boats, mentioned decreasing prices of shrimp. It is not listed in Table 3.1 because this core problem was not mentioned by other groups. It is indicative of their greater sophistication that the economically better resourced mechanised fishermen blame the glut in shrimp production by aqua culture in the international market. Ironically, many in aqua culture and hatcheries were adversely affected by the white-spot virus at the time of research in 2004. Nevertheless, these fishers blamed aqua culturally produced shrimp of not only creating a glut, but of destroying the good name of the Indian wild shrimp that they catch.

These sona boat owners claimed that the poor quality aqua culture produced shrimp was being mixed with the wild shrimp for export. [This should not happen according to MPEDA rules.] And hence, the shrimp was not passing the quality control requirements of the European market. They were also aware that imports to the United States had been stopped due to pressure from the US shrimp producers' lobby. Mechanised boat owners and crew also claim that there is collusion between the middlemen to whom they sell and the exporters. They claim that there is no transparency in international prices and that those listed in the harbour are not correct.

In the motorised and mechanised sectors, the increase in the price of fuel is another major reason given for their declining in incomes. In 2003, the price of diesel went up by Rs. 4.This core problem accounts for the changes in fishing practices more than any other with regard to down-scaling of technologies and increasing competition for fishing territories near shore.

Among fishers in the small-scale sector, what has contributed the most to their decline in incomes has been the ban on seed nets. In the early 1990s, before the development of shrimp hatcheries, there was a tremendous demand for shrimp seed for aqua culture. According to fisheries officers, the demand continued after the building of hatcheries (in the mid-1990s) until about 2002. Every fisher family, and many non-fishers, caught shrimp seed in fine mesh nets along the shore or from

boats. For each seed, they received two or three Rupees. A family could earn several hundred Rupees per day. Proceeds from shrimp seed contributed greatly to household income and enabled building new houses, as well as investment in fishing.

Vivekanandan, et. al. estimate that ninety percent of the by-catch was destroyed by shrimp seed nets (1997:70). Most fishers interviewed were aware that seed nets damage fish stocks. During the last few years, the Fisheries Department and the caste elders have largely stopped the use of these destructive nets. Furthermore, as a consequence of supply from the hatcheries and the slump in aqua culture due to the white spot virus, the demand for wild seed has dropped and the price is only about one to five paisa. (There are 100 paisa to the Rupee). This has curtailed the use of seed nets more than any other factor.

Without this source of income from shrimp seed, fishers are more dependent on fishing. At the same time, the fish resource probably has declined in part due to shrimp seed capture. Consequently, competition for fishing at sea has been accentuated, particularly fishing within about three kilometres from shore.

This context raises two central issues. The first is that the perception of declining incomes can not be attributed solely to the resource health of the fishery. Rather, declining income is perceived in the comparative context of their incomes when they were selling shrimp seed. The second issue is that the increased competition for a livelihood solely from fishing puts increasing pressure on the legal pattern of the state and non-state legal systems. Therefore, the perception of declining incomes is also related to issues of resource distribution.

3.2 SIGNS OF RESOURCE DEGRADATION: Decreasing Fishing Stocks

Fishers in all sectors say that fishing stocks are declining. However, this is not supported by the Fishery Department data on catches. The total marine production in East Godavari District has dramatically increased from 16,697 tonnes in 1993-4 to 54,790 tonnes in 2003-4. Several fisheries officials have said that their data, particularly the data sets for earlier years, are not reliable. Nor are the data sets strictly comparable: different sampling techniques and slight changes in the boundaries of the Kakinada Division were introduced within a year or two before

research commenced. Nevertheless, such a dramatic increase is suggestive of an increase in total production, or at least of total recorded production.

In terms of fish catches, it is often assumed that the non-mechanised fishing is a small actor. Not only are the majority of fishers operating in this sector; but Andhra Pradesh Fisheries Department data for 2000-1 and 2001-2 show that in East Godavari the non-mechanised sector catch for marine fish and shrimp was greater than that for the mechanised sector. In Table 3.2, it can be seen that the catches are more or less evenly divided between the two sectors over a three year period, 1999-2002. It should be pointed out that it is not clear to the author if the category of mechanised included all motorised boats in this particular data set[6]. If it does, the proportion of fish and shrimp caught by the small-scale sector (which includes motorised boats) would be substantially greater. Furthermore, data collected in village-based fish landing centres would be more difficult to obtain than at the harbours; and therefore, catches from the small-scale sector probably are under represented. Consequently, the significant contribution of the small-scale (i.e. without mechanised trawl nets) fishery sector to fish production needs to be appreciated.

Table 3.2 Marine Fish and Shrimp Production

	Mechanised	Non-mechanised	Total
1999-2000	13,633 ton. (58%)	9,897 ton. (42%)	23, 530 ton.
2000-01	11,727 ton. (43%)	15,814 ton (57%)	27, 541 ton.
2001-02	13,672 ton. (44%)	17,500 ton. (56%)	31,172 ton.

Three sona boat owners told me that 17 years ago (1987) they fished at 20 meters depth; now they are fishing at 150 meters depth and not securing fish. The voice of small-scale fishers also echoes a perception that stocks are decreasing. However, small-scale fishers perceived 2003 as a good year for fishing. Accurate data is difficult to obtain and is contradictory. Research was done between July and December, 2004, the low season. During this period, there are tremendous

variations in catch. For example, individual shore seine catches varied between Rs.40,000 and Rs. 100 within a few weeks. Data on all catches sold at one local market, Mulapeta, on random days were collected. There were tremendous variations in catches caught during the same fishing period (*padu*) by the same mode of fishing on the same day. Small-scale fishers mostly attribute the variations to 'luck'. 'Fishing is like playing cards'. At the same time, they acknowledge the importance of keeping their gear in good order, as well as weather conditions (wind, waves, cycle of the moon, etc.). These daily and seasonal fluctuations are not the same as those perceived as a longer term pattern of decreasing fish. They blame pollution from aqua culture, hatcheries, agriculture and industry. They blame more the mechanised sector for capturing the fish before they reach inshore waters. They also blame themselves for using seed nets.

3.3 ECOSYSTEM SHIFTS

3.3.1 Pollution

Some fishers in all sectors believe that pollution, especially from industry, agriculture, and shrimp hatcheries is causing a decline in fishing stocks. Intensive agriculture in the delta and the opening of new irrigation schemes near Uppada are having an impact on estuary fishing, as well as marine fishing. Shrimp are dying in aqua culture ponds in part due to pollution from the water supply. The major factor is infections from white spot virus. However, aqua culturalists claim that the lack of resistance of shrimp to the virus is caused by polluted water. Aqua culture in turn is adding its own waste to the pollution problem.

Aqua culture was started in the district in the 1980's. According to one senior fisheries scientist, aqua culture itself is a major polluter. Those managing aqua culture ponds in the research area reported serious problems with water pollution. According to them, the water used to fill the ponds is polluted and is a major factor in the high incidence of white spot virus. Those managing ponds unaffected by the virus claim that the high incidence in other ponds is due to unhygienic practice. The effluent from all ponds is dumped into nearby estuaries.

Shrimp hatcheries are also blamed as contributing to pollution by all fishers. However, the shrimp hatchery owners claim that their water is filtered before recycling into the sea and that their waste is negligible. Some Fisheries Officers agree that the hatcheries are not causing pollution. However, some Fisheries Officers, and even the owners, acknowledge that the high levels of anti-biotic may be influencing fish development and reproduction. On the other hand, one Pollution Control Board official claimed that their data on effluents from hatcheries and aqua culture show that they are not polluting.

The Pollution Control Board has taken a number of actions to reduce industrial pollution, particularly by imposing stricter controls on industrial waste. Industries are supposed to treat their waste before it is dumped into the river channels or the sea. Some officers of the Pollution Control Board (PCB) claim that its actions are effective; but fishers in the Godavari Delta claim, and it has been observed, that the dumping is continuing as evidenced by the dead fish floating in the backwaters of the Godavari River.

With regard to hydro-petrol depots, the Pollution Control Board in Kakinada does not expect pollution from this source. The PCB is regularly renewing and reviewing these depots. There are dykes around the plants to prevent leakage and spillage from entering surrounding land. The industry is very careful because hydro-petrol is highly explosive.

One senior fisheries scientist official thought that pollution is much better today than 15 years ago. However, pollution remains a major problem which he attributed to the fact that even with clearance of PCB, industries do not always comply. All pollutants go to the sea, directly or through natural drainage system of creeks and rivers. More seriously he pointed out that there is no research on the impact of pollution on the sea and the fish and other organisms living in it.

3.3.2 Beach Erosion

Annual cyclones contribute to beach erosion. The Forest Department has planted casuarina trees near the shore of many villages, especially those beyond Konapapapeta, to reduce the impact of cyclones. According to the fishers living along the coast north of Kakinada, the beach has been reduced by several hundred meters

over the last twenty-five years. It is claimed by some that the Godavari spit, Hope Island, has created currents which have sped up the process, especially at Uppada.

In villages like Uppada and Konapapapeta, where the village was originally near the shore, this erosion is most obvious. The beaches there are narrow and the majority of housing has been moved farther inland. In Mulapeta, the village begins beyond a flood plain. From maps of 1903, substantial land has been washed away in Mulapeta during the past 100 years. Furthermore, changing contours of the rivers and sea shore have been observed during the period of research in 2004, before the tsunami.

3.3.3 Dredging for the Deep Water Port

This has disturbed the eco-system of Kakinada Bay. Furthermore, the dredged sand was deposited near Konapapapeta, disturbing the eco-system there.

3.3.4 Trawling

This disturbs the sea bottom ecology. Several Fisheries Department Officers reported this as another major factor to declining stocks.

3.4 CHANGES IN FISHING PRACTICES

Fishers are responding to their declining incomes in many different ways. Some are increasing their debt to invest in more capital intensive technologies. Some are selling their other assets, such as land, in order to maintain their present fishing activities. Others are diversifying their fishing techniques and fishing territories.

Fishing practices are continuously changing. One aspect of this is the adoption and transformation of technologies which is a dynamic, continuous process. Each gear owner has his own ideas about how to improve the construction of his net or boat. From season to season, fishers adopt different technologies to catch different species, often in different locations. These seasonal fluctuations are compounded by changes in ownership. From year to year, the number of boats and nets change as the financial circumstances of fishing gear owners change.

The diversity of responses to meet livelihoods can be perceived at the individual level of analysis, which may be blurred by the aggregation of fishing modes. At the level of the small-scale fishers, changes in technology are expressed by ingenuity and imaginative experimentation. For example, one fisherman in Mulapeta used a trammel net by securing one end to the shore as a pivotal point and walking waist deep in the surf. This net is normally used by two fishing boat crews working together at sea. Another example is the stitched boats. The timber needed for the logs for *karra teppa* has become too expensive. So, the logs are sawn into planks to make various types of stitched boats (*kattla teppa).* Using the shore seine in the river is another example, and there are many more.

The persistence and, to some extent, the resurgence of shore seines and non-motorised craft, point to some of the problems of recurrent costs associated with motorisation. Examination of shore seines illustrate that although both their initial costs and recurrent costs are similar to those of Beach Landing Crafts, there appears to be increasing use of marine shore seines and their new use in river territories where they had not been used previously (Southwold 2005). In Mulapeta, one third of the shore seine owners are making shore seines and navas to sell to fishers from other parts of Andhra Pradesh.

Among the Vadabalija, although their fishing practices are adapted to changing circumstances, there is little movement from fishing into other modes of livelihood**.** The exception is that many of the wives of poorer fishers are working as agricultural labourers. And many, particularly women, work as fish traders and processors.

From these individual changes in fishing practices, more general trends can be discerned at the district level: 1) down-scaling of fishing technologies; 2) localisation of fishing grounds; 3) economic polarisation; and 4) greater processing and sale of by-catch. [The last is not discussed in this report.]

3.4.1 Down Scaling of Technologies

There have been two phases of technological innovation in East Godavari District between 1985 and 2005. The first was the adoption of more efficient fish catching technologies involving new construction materials for boats and nets: mechanised boats, boats built with fibre reinforced plastic many of which have out-

board or in-board motors, and nylon nets. In Andhra Pradesh, the state has been active, and continues to be active, in supporting new technologies through credit programmes and training. In addition, the Bay of Bengal Programme (FAO) has taken initiatives towards motorization of crafts. At the initial stages, the introduction of technological innovations led to greater fishing efficiency in the capture of fish and in expanding fishing territories. In response to the potential for higher profits, there had been an increase in the number of motorised and mechanised boats and higher profits. At a later stage, this technological efficiency contributed to a depletion of fishing stocks. The consequence of this second phase of technological innovation has been a down scaling of technologies.

According to John Kurien, the modern history of fisheries development in Kerala, '…is a history of state-led "modernization" which attempted to copy the paradigm of northern, temperate fisheries model of standardization of craft and gear so as to get the maximum output from the sea' (2000: 12). Kurien reports that some fishermen have switched back to non-motorized fishing in response to the drop in catch rates caused by a dramatic increase in the number of motorized units stimulated by state-led incentives (ibid.: 20). The same pattern is occurring in East Godavari District.

Thus, the first trend in changing fishing practices is a pattern of down-scaling of technologies. Those in weaker economic positions are down-scaling to other technologies or working as crew rather than as owners. Although there is little reliable hard data, this pattern is clear from life histories of fishers representing all modes of fishing who perceive this down-scaling process as beginning in the mid-1990's, after a period of rapid up-scaling of technologies.

Several interviewed mechanised boat owners had sold their boats and were working as crew on other mechanised boats or had bought fibre engine *teppas* and boats. Most owners and crews of smaller mechanised boats interviewed state that the numbers of boats are declining and being sold for scrap. Three boat owners said that over 100 boats had been sold for scrape between 1999-2004. One fisher said that 70 boats had been sold during 2003 by fishers based in Yetimoga. In addition, several small mechanised boat owners were interviewed who plan to sell their boats.

There also is some evidence that motorised crafts are declining in numbers due to their recurrent costs. Consequently, owners of motorised crafts are selling them for non-motorised boats. Furthermore, they are fishing in the territory reserved

for non-motorised boats. Competition over near shore fishing territory is compounded by changing patterns of migration. Fewer motorised boats can afford the costs to migrate and are being discouraged to do so by the host community. Other boat fishers are buying shore seines in East Godavari District and in other districts (Vivekanada 1997; Southwold-Llewellyn 2005), often buying repaired second-hand nets to reduce costs.

Other small scale fishers are investing time and capital into diverse alternative fishing modes. Some fishers, especially boat owners and shore seine crews, are building Kakinada navas to fish with small shore seines in the estuaries. This is symptomatic of increased fishing by marine fishers in estuaries.

3.4.2 Localisation and Encroachment of Fishing Territories: Conflicts over Space

A second trend is the localisation of fishing grounds as a direct result of down-scaling. Consequently, there is encroachment into the fishing territories of fishers at a lower-scale. This has led to increasing conflicts over fishing territories: 1) smaller mechanised boats encroaching into the near shore territory of small-scale boats and shore seines; and 2) small-scale marine fishers encroaching into river fishers' territory.

The problem of mechanised boats (trawlers) fishing in the territory of small-scale fishers is widely reported. The project's main concern is with conflicts between the mechanised and non-mechanised sector. This is a simplification. There is little problem between the resource richer mechanised boats who can afford to fish beyond 23 km. No doubt there are conflicts among these sona boats; but they were reported briefly by the boats owners interviewed. And no conflicts with semi-industrial trawlers were reported.

There are, however, major conflicts between the resource poor mechanised boats who fish near shore and all fishers in the small-scale sector. Many mechanised boats are in a poor state of repair. This later group cannot afford to fish within their designated zone; hence, longer fishing trips are in decline. The crux of the problem is that fishing in deep water is not commensurate with the cost of fuel in the context of decreasing prices.

On numerous occasions, hundreds of these mechanised boats can be seen close to shore, often within a kilometre from shore. These mechanised boats often fish within the shore seines, and damage the shore seine. Boat fishers also claim that these mechanised boats damage their nets. On the other hand, the mechanised boats complain that the small-scale boats and their nets cannot be seen at night.

Conflicts between mechanised boats and small-scale fishers started when mechanised boats were first introduced. In fact, a study in 1978 in Danaipeta reported that it was a serious problem then (Subrahmanyam et.al. 1978). Therefore, conflicts over space are not new. However, the problem has escalated due to the increase numbers of boats and declining incomes from fishing. Furthermore, it is no longer a problem between mechanised boats and the rest. The conflicts over fishing territories affect every mode of fishing.

There are many conflicts between motorised boats and non-motorised boats. Repeatedly I was told by non-motorised boat fishers that motorised boats, i.e. motorised teppas, beach landing crafts, and fibre engine boats, are a worse problem than mechanised boats. This perception is because disputes with motorised boats are often with boats from their own caste community residing in nearby villages, and because there are more motorised boats than mechanised boats.

Conflicts among shore seines of different villages occur; but the rules governing these conflicts appear to be straight forward. Conflicts among shore seines of the same village have been witnessed. Although the rules governing the laying of shore seines are precise, more powerful shore seine owners often allow their nets into the space of a weaker net owner. (Weaker in the sense of having fewer economic resources: poor quality net, fewer crew, etc.)

Marine small-scale fishers, the Vadabalija, have always supplemented their incomes by fishing in the estuary territory of the Agnikula Kshatriya. Due to down-scaling of technologies in other fishing modes, marine fishers are increasingly using the estuaries. Investment in Kakinada navas and small shore seines increases the exploitation of river resources. It is comparable to the process of motorisation of marine fishing.

3.4.3 Economic Polarisation

The third trend is economic polarisation. A financially secure core of owners in every mode of fishing, will probably survive. Those sona boat owners who are investing in more intensive technologies, such as GPS and sonar, can afford to fish beyond the 23 kilometre from shore for 10-15 days fishing trips. They claim that it is only beyond the inshore waters that a good catch can be attained. Some of the shore seine owners whose families have been among the financially better resourced and have additional assets which enable them to diversify their income sources are also likely to be able to continue fishing. Similarly, there are numerous financially secure fibre engine teppa and fibre engine boat owners. However, for many more, the down-scaling of technologies and conflicts over space are symptomatic of their declining economic position.

3.5 CHANGING PATTERNS OF MIGRATION

3.5.1 Small-scale Fishers

It is difficult to generalise about the patterns of migration among small-scale fishers. There is variation in the modes of fishing, crew-owner relations, destination, and duration. Unfortunately, the data has not been analysed. Research was conducted during the season when large numbers of motorised boats migrate to other parts of the coast, particularly to Orissa. At the same time, many said that it was increasingly difficult to fish in Orrisan waters because fishers from Andhra Pradesh had been banned by the government of Orrisa. However, there are historical links with several fishing communities in Orissa. Many fishers settled permanently in Paradeep, Orissa, because of lack of work in Kakinada. This occurred in the mid-1980, if not earlier. Because of links with the established families there, fishers from East Godavari are able to migrate and to gain access to fishing in Paradeep. (See Schoembucher 1988).

In many of the fishing villages north of Chodipallipeta, fishermen are now migrating to Gujurat to work as crew on trawlers. And others are fishing in lakes and dams, mostly in Maharashtra. In both cases, the fishermen are working as crew and

all the boats and gear are supplied by middlemen. In some villages, all of the able-bodied men migrate for up to eight months a year.

There is also some migration of non-motorised boats and shore seines, for short periods of time. The following case from Mulapeta gives insight:

> On the 19th of December, 2004, a shore seine belonging to MN went to Konareka area in Orissa where there are no shore seines and good prospects for fishing. The shore seine and nava were carried by lorry. All crew (30) will go to Konareka on the 22 December. One month ago, MN sent three crew to Konareka area to observe the fishing and get some advance agreement. The crew decided that there may be good fishing. In Konareka, a fish trader is ready to give Rs. 1 lakh as an advance. MN need not pay interest on the advance. But he must sell the fish to the trader. The fish trader will reduce the price by 10%. The remaining amount will pay to MN e.g. if the fish value is Rs. 1000, the trader will pay Rs. 900 to MN. The income given by the trader will be divided ½ to *alivi sarangi* [shore seine owner] and ½ to crew**.** The trader will supply all the essentials to the crew. If fishing is good, MN will stay there to second week of February. Otherwise, they will return. After his return, MN *alivi* will get *padu* right until completion of this fishing year.

3.5.2 Mechanised Boats

Mechanised boats migrate to different parts of the east coast throughout the year. However, the competition with other fishers from Orissa and from other districts of Andhra Pradesh is forcing them to fish closer to home. When mechanised boats began to migrate is not known. One boat owner reported that he has migrated to Visakhapatnam area for two months every year since 1994 during June and August. Previously, local stocks were sufficient.

According to the President of one Mechanised Boat Owners' Association, boats need permission from state fisheries department to fish in another state. According to him, there is an agreement with the Andhra Pradesh and Tamil Nadu governments; but there is no agreement with Orissa. If Kakinada boats fish in Paradeep, the local boat owners' association report them to the police. The courts

impose a fine of five times the value of the catch. This happens often. There is no cooperation between the Paradeep Boat Owners' Associations and the Kakinada Boat Owners' Associations, although Paradeep boat owners purchase their boats in Kakinada.

3.6 INCENTIVES TO OVER FISH

Many fishers told me that there are few alternative sources of livelihood. If they study to get higher qualifications, fishermen do not get jobs. This discourages others from advanced study. Most fishers are aware of the dangers of over fishing for future stocks. They justify over fishing by saying that they cannot think about future when they have problems today.

3.7 BARRIERS TO ENTRY

The major barrier to entry is money to invest in necessary fishing technology**.** During the boom period of marine shrimp fishing, many of the boats were financed by those from outside the fishing castes. Most of these investors have now withdrawn from the sector**.** In the mechanised sector, drivers are encouraged to have training from SIFT (State Institute for Fishing Technology) to get a license; but this is not necessary. To qualify for the course, they must have education to the 7^{th} standard.

In the small-scale sector, there are territorial limits to use of shore seines. Furthermore, caste elders have restricted the use of some new technologies, e.g. ring net. Practicing fishers are from either the Agnikula Kshatriya or Vadabalija fisher castes, with the exception of a small Jalari community (see Table 2.1). To my knowledge, no Vadabalijas in East Godavari District are working in the mechanised sector, although some migrate to work as crew on boats in Gujurat. In the northern part of the district, some Agnikula Kshatriya work as crew for the Vadabalija, especially on the shore seines; but this is rare.

3.8 GOVERNMENT RESPONSES TO THESE CHANGES

Government responses to changes in fishing practices are primarily through the Fisheries Department. Their implicit policy aims are three fold: 1) to separate

modes of fishing into separate zones; 2) to conserve fishing stocks; and 3) to maintain the livelihoods of fishers. They have employed a number of approaches to achieve their aims. One has been management of fishing practices through legislation such as the 1995 Andhra Pradesh Fishing Regulation Act. A second approach has been grants and training to diversify fishing modes and target species. The third approach has been welfare programmes. Before considering these responses in detail, the following section will consider what Fisheries Department officials identify as the core problems. Most of the interviews with officials were 'off the record'. Therefore, their views will be presented anonymously. Most of the officers identified the same core problems which are presented here as a whole.

3.8.1 Perceptions of Fisheries Department Officers

One of the first problems mentioned was that mechanised boats and motorised boats are fishing close to shore. Some said that these boats must fish beyond 50-75 meters depth, i.e. about 10 kilometres from shore. Most related this problem to increasing fuel costs. One official said: 'From the trawler's point of view, fishing in deep water is not commensurate with the cost of fuel. Oil prices are escalating. It has increased Rs. 4 in the last year. At same time, fish prices are decreasing'.

In their view, motorised boats disturb fishing of the 'traditional' fishers close to shore. This in turn contributes to the declining catches in East Godavari District, partly through over fishing and partly due to the ecological damage done with trawl nets. In addition to shallow water trawling, four other core problems that are also reasons for declining catches were mentioned: wild shrimp seed collection, mesh size of nets, the lack of diversification of crafts and targeted species, and industrial pollution.

From 1996-2002, wild seed collection was very extensive. This was in response to the demand for shrimp seed in the rapidly expanding aqua culture. After 2003-4, there was a decline in demand because hatcheries could supply shrimp seed to aqua culture and because there was wider information about the dangers of collecting wild seed.

A maximum mesh size of half an inch (12.7 mm) is stipulated in the 1995 Fisheries Regulations Act. This implies that the use of mesh smaller than half an

inch was considered a factor in declining fishing catches. However, Fisheries Department officials did not identify the use of smaller meshed nets as a serious problem. Although they admitted that there were some infringements by mechanised boats, one official said: 'No one is serious about alivi enforcement'. This illustrates the generally held attitudes that: 1) the shore seine (*alivi*) is not considered destructive in comparison with other trawl-type nets; and 2) the more general view that the traditional or small-scale fishery is not responsible for declining stocks. This bias towards the small-scale sector has a number of implications which will be explored later in the report.

The lack of diversification in target species and crafts are a fourth core problem that is linked to decreasing stocks. The major target is tiger shrimp. Officials thought that more species should be targeted. In their view, there is also a need to modify crafts in both the mechanised and the small-scale sector to catch different species.

Linked to this is the opinion that government interventions are very weak for marine products. A minimum support price is only available for agricultural products, not for marine products. Therefore, another core problem is that a minimum support price is needed.

The view of most fisheries officials is that coastal pollution, especially industrial pollution, is another major cause of decreasing stocks. One official said that the main sources are paper mills and sugar factories at Rajumundry. Another identified oil exploration near the mouth of the Godavari River as a potential problem for the future. Several were critical of the Pollution Control Board. The PCB holds public hearings in places and venues that discourage all stakeholders from attending. This tends to strengthen the hand of investors because they are the only stakeholder present. During the meetings, industry promises local employment which is a persuasive argument. Consequently, their proposals go ahead. In fact, local people are getting little benefit from it.

With regard to the main topic of this report, the lack of power of the fisher community is perhaps the most important with regard to the non-state legal system. This will be discussed at length in the following chapter. This is perceived as a core problem by both fishers and Fisheries Department officials.

Related to this is the core problem that the fishers' leaders are selling them out to industrial interests, oil exploration interests and hatcheries. This was never

mentioned by the fishers themselves. Given that the research did not focus on the areas of East Godavari where oil exploration is taking place, it is not surprising that I heard nothing about this. In the study area, the caste elders of other caste groups were blamed for giving permission for hatcheries to be built in Konapapapeta where the majority of the hatcheries are located. However, given that the president of the Village Panchayat is from a Scheduled caste and that the vice president is a Vadabalija, they must have had some influence on the decision. The dynamics of decision-making in those villages where industry is being developed is not known. However, there has been some development and there will be more. It is, however, highly significant that this is identified as a core problem by some Fisheries Department officials. According to one official, fishermen are not united. Elders get financial incentives and manage any local protest. The developers use back door techniques: they identify the important people and give them incentives to support their cause.

This view of fishermen's leaders helps to explain their bias in trying to introduce community based management which will undermine the authority of the caste elders. It also emphasises the need to appreciate the heterogeneity of interests within the fisher communities at both village and district level.

Another core problem that was emphasized by both fishers and the Fisheries Department officials is the inability of the Fisheries Department to enforce its legislation. The weakness and lack of resources of the Fisheries Department undermines its capacity to implement its policies and symbolises the limited priority given to fisheries by the government of India. Naturally, this undermines the authority of the state legal system to manage fisheries. Furthermore, where the non-state system is weak in addressing many of the core fishing problems, the fishers themselves acknowledge the need for the state to address these problems. This will be one of the conclusions of the following chapter on the non-state legal system. Before describing the non-state legal system, the response of the government to these core fishing problems and the consequent changes in fishing practices will be discussed. This will help to put both the non-state and the state legal systems into context.

3.8.2 Legislation

Andhra Pradesh Fishing (Regulations) Rules 1995

The Andhra Pradesh Marine Fisheries Regulation Rules came into force in 1995. The main objectives are:

- *To protect the traditional fishermen who depend on marine waters along the coast line of the state.*
- *To regulate the marine fishing activities all along the coast.*
- *To avert conflicts among fishermen in the sea*

(State Institute of Fishing Technology, Training Manual, nd).

The Act itself does not state its aims explicitly. However, it is implicit that protecting small-scale fishers is its primary purpose. As can be seen in Table 3.3, it is only with regard to fishing practices concerning the size of mesh that the rules apply to the small-scale sector. The regulation about fishing territories stipulates that eight kilometres from shore should be reserved for the traditional boats. It is ambiguous whether this included motorised boats. The closed period only mentions the mechanised sector. Again, this is ambiguous about whether it includes motorised boats in the small-scale fishery. In any case, they now are considered to be included. Most interesting, it prohibits mechanised craft from causing damage to craft/tackle of any non-mechanised fishermen.

Its primary function is to detail the penalties for lack of compliance. In fact, most of it deals with the registration of all fishing crafts, including traditional fishing crafts. This in itself is most interesting because very few boats, except most in the mechanised sector, are registered. And even in the mechanised sector, the registrations are not up-to-date.

Table 3.3 Fishing Regulations Act

Rule	Traditional Crafts	Mechanised crafts
Registration of all crafts	x	x
No nets with mesh under ½ inch are allowed	x	x
Closed period		x
Mech. Craft penalties for damaging non-mech. crafts		x
Fishing territories- 8km from shore reserved for non-motorised boats		x

The Rule that fishing nets should not have mesh smaller than ½ inch can be viewed as a response to the core problem of declining stocks. The Act has been augmented by a ban on shrimp seed nets in 2002 which mostly affected the small-scale fishers. The ban on seed nets is another response to address this core problem. Characteristically, this is vague.

> There is a ban or recommendation pronounced against seed collection. Information about this recommendation is difficult to get hold of and differs depending on whom you talk to. Even information from different local governmental agencies differs. According to CMFRI (Central of Marine Fisheries Research Institute) in Kakinada it is only a recommendation from the time the pond cultures started. They argue that cultures should be self-sufficient in seed (seed from hatcheries) and not interfere with wild stocks. Further they say that the regulations for wild seed collection should be financed by the beneficiary (pond industry). According to CMFRI the reason for this recommendation against wild seed collection is that the fishing methods used are destructive and cause a great loss in marine populations, other than the tiger shrimp, through by-catches.
>
> In contrast to CMFRI, the State of Fisheries (State fisheries corp.) argue that it is a ban against wild seed collection with a total stop for landing seed. They say that this ban was pronounced 1999 and is valid all year around. There are, unfortunately, no local government nor any economic

prerequisites to implement this ban. Therefore the collection of wild caught seed continues. (Petersson 2002: 17-18).

Another response to address the problems of declining stocks and conserving resource health has been the introduction of a seasonal fishing ban from 15 April to 31 May**.** According to the AP Deputy Director of Fisheries, AP was the first state to impose a ban on fishing. In his view, the ban has a good impact on production during the period after the ban. The dates of the ban are not stipulated and the ban only applies to mechanised vessels in the published Rules. However, as will be shown in Chapter Four, some in the small-scale sector also perceives itself to be included in the fishing ban. When the state included the small-scale sector in the ban is not known. However, in 2004, the artisanal (small-scale) sector, including traditional boats without engines, was exempted from the ban by the AP Fisheries Department.

The regulation to protect the fishing territory of the small-scale fishers imposes reserved zones for different fishing boats. This can be viewed as a response to the core fishing problem of competition in near shore fishing territory.

> Restriction of Fishing. (1) Non-mechanised Traditional fishing Crafts shall be allowed to operate freely without any restrictions. Waters upto 8 kms., from the shore be reserved exclusively for such fishing crafts and in no case any other type of mechanised fishing vessel shall be allowed to operate in that area.
>
> (2) Mechanised Fishing Vessels below 15 metres OAL shall be allowed to operate from 8 KMs. And above from the coast. [Note: this would include sona boats].
>
> (3) Mechanised fishing vessels of twenty five gross tonnes and above or 15 metres and above of length shall be allowed to operate only beyond 23 Kms. from the coast.
> (GoAP, 1995b: para. 16).

The types of vessels included in the mechanised fishing vessel category are not defined. However, with regard to registration fees, the following classifications are used:

- Mechanised fishing vessels above 25 gross tones or above 15 metres OAL.
- Mechanised fishing vessels upto 15 metres OAL
- B.L.C.s and other motorised craft using for propulsion of craft only
- Crafts above 8.5 metres using sail and oars. OAL
- Country crafts upto 8.5 metres without sail and oars. OAL.
  (GoAP, 1995 b: para 4).

For the purposes of interpreting the zones, it is not clear if motorised boats are included as mechanised, that is that motorised boats should fish beyond 8 kilometres. However, non-mechanised traditional fishing crafts could only mean non-motorised traditional boats.

3.8.3 Diversification of Modes of Fishing

One response has been to encourage the adoption of new technologies through grants and training schemes. These schemes have encouraged the adoption of nylon nets in all fishing modes, as well as the adoption of motorised boats and mechanised boats. In response to the increasing conflicts over space, their response continues to be to encourage fishers to adopt technologies which will enable them to fish farther out in sea and using more powerful engines, GPS, sonar, etc. and to target new species. Most recent has been a programme to encourage larger sona boats to be designed to catch tuna with long lines.

Another response has been to stimulate aqua culture. In fact, there is a major shift in Fishery Department policy towards the development of aqua culture. This is definitely seen as the area of greatest potential by Fishery Department officials interviewed.

3.8.4 Welfare Programmes

The Fisheries Department has a number of programmes to benefit fishing communities. Information supplied by the Fisheries Department in Kakinada is as follows[7]:

Schemes initiated between 1995-2004:

(1) Relief cum savings scheme. This scheme is being implemented with a view to financially assist the fishermen during the lean period [i.e. during the fishing ban]. Each fisherman has to deposit Rs. 75/- per month for a period of eight months. The Government will release an equal amount to Rs. 600/- as a matching grant. Unfortunately, the take up of this scheme is limited due to limited government funding. For example, only 300 could participate in 2004, in the three villages of Uppada, Mulapeta, and Konapapeta with a population of 7,000 active fishers.

(2) Group accident insurance scheme. Under this scheme the kin and kith of the deceased/missing fisherman will be paid an amount of Rs. 50,000/- and the disabled fisherman will be paid an amount of Rs. 25,000/- by the Insurance Company in the event of death disability while in fishing. The Government of Andhra Pradesh will pay the Insurance premium to the Insurance Company on behalf of the fishermen.

(3) Housing scheme. Under this scheme that Government sanction houses to the fishermen with the unit cost of Rs. 40,000/-. Out of 40,000/- , 2,500/- will be the beneficiary contribution, 27,500/- Institutional finance, and remaining 10,000/- will be the subsidy of the government of Andhra Pradesh.

(4) N.C.D.C. Scheme (AFCOF). 1) Under this scheme the fishermen were supplied with F.R.P. Navas with unit cost of Rs. 2,00,000/- with the subsidy of Rs. 40,000/- per unit. 2) Fisherwomen Cooperative Society Members were supplied with Insulated Ice Boxes on 75% subsidy to reduce the post harvest losses.

(5) Motorisation of Traditional Craft. Under the scheme an amount of Rs. 12,000/- on I.B.M./O.B.M. and Rs. 10,000/- on O.B.M. or 50% of the engine cost which ever is less will be provided by the Government as subsidy under centrally sponsored scheme for the benefit of Traditional Fishermen possessing own country crafts.

(6) Supply of H.S.D. oil. The fishermen will be supplied with HSD oil on subsidised costs @ Rs. 4.15 per litre for other boats. Limited to 100 Lts. For each Motorised Crafts and 1000 Lts. To each Motorisation of Fishing Vessel for 10 ½ months. [This subsidy has been increased regularly since 2004].

Schemes that have been recently started in 2004:

(7) Adarana Scheme. The fishermen were supplied with FRP Navas under this scheme through B.C. Society of East Godavari District. 300 units supplied under the scheme.

(8) Supply of V.H.F. sets. V.H.F. sets with 50% subsidy supplied to Motorisation of Fishing Vessel for communication of bad weather and information on Potential Fishing Zone through 12 shore stations in the coasts of Andhra Pradesh.

In addition to these schemes the Fisheries Department takes a pro-active role in providing services to fishing villages. In several villages, concrete platforms have been built to dry fish. And there are also sheds built near shore for fishermen to store their nets and repair them.

CHAPTER FOUR: NON-STATE LEGAL SYSTEMS

Fishers have developed non-state legal systems to regulate their fishing activities. Two non-state legal systems will be discussed: that of the mechanized boat fishers and that of the small-scale fishers. The idea of open access to the sea is often expressed as, 'The sea belongs to everyone'. However, in practice, fishing is a common property resource in the sense that fishers try to regulate the use of the fishery. Primarily both non-state systems entail regulating fishing territories and regulating technologies used in fishing. In both aspects, there is an explicit notion of equity of opportunity to catch fish which addresses resource distribution. Customary practice is that once a net has been laid, it is the territory of the net owner until he finishes fishing. If another fisher enters 'his' territory and damages his net, the other fisher is responsible for compensating the earlier fisher whose gear he has damaged. In practice, however, the ideology of equity is challenged by disputes. Secondly, both non-state legal systems are concerned with the relations between gear owners and their crews. Particularly in the mechanized sector, owner-crew relations are changing; however owner-crew relations in the small-scale sector tend not to be stable either. These changing patterns reflect the changing context of fishing.

The state legal system also addresses regulation of fishing territories between different modes of fishing. In addition, it addresses resource health through bans on fishing and on the use of small meshed nets. These state rules have been incorporated into the non-state legal systems. The state system depends on the non-state legal systems to enforce state laws concerning fishing. Among both scales of fishers, state laws have been translated into practices which fit into the conceptual frameworks of fishers and the capabilities of those from their communities who are responsible for negotiating intra and inter group disputes.

Comparatively, the capacity of community leaders to enforce the rules pertaining to their fishing sector is related to the degree to which their power is embedded in social, religious, economic and political relationships. This is strongest with regard to the small-scale fishing communities, whose leaders are the caste elders (*kula peddhalu*). This is turn is related to the degree to which the fishing activity is village-based. Hence, there is the greatest control in shore seines, as

compared with small-scale boat fishing. A case study of Mulapeta, where shore seines are the predominate mode of fishing, will support this argument.

At the other extreme is the non-state legal system of mechanized boat owners' associations. The officers of the boat owners' associations are elected representatives of the owners. There is no organization to represent the interests or manage the practices of mechanised boat crews. The boat owners' associations have emerged with the introduction of mechanised boats and are comparatively less embedded in wider social relations. Mechanised boat owners and crew have moved from their ancestral villages in the Godavari Delta to Yetimogha and Bhairapalem near major fishing harbours. It is significant that most of the rules concerning mechanised boats are those of the state.

Fishers as a group are politically weak because they have low status, low incomes, and little political power. Both Vadabalija and Agnikula Kshatriya fishing castes are classified as Backward Castes in Andhra Pradesh. Several of their leaders in East Godavari District are pressurizing the government to re-classify these castes as Scheduled Tribes. They pragmatically reason that as a Scheduled Tribe, they will be entitled to more advantages of positive discrimination. Although the Agnikula Kshatriya claim that they originate from a high caste, the Kshatriya, and they do not inter-marry with the Vadabalijas, their occupation is religiously polluting, which is emphasized in Andhra Pradesh by the fact that Brahmins and other high castes are vegetarian.

As a group, most fishers have low incomes that under scores their low status. There is, of course, differentiation within their communities. Some of the mechanised boat owners, especially those who own several boats are wealthy, as are some of the shore seine and motorised boat owners.

Their weak political power in the arena of state politics is characterized by the political fragmentation among the fisher castes. [An exception has been expressed in their solidarity against a proposed ship breaking yard in Kakinada in 2004-5, and the protest in 2006 in Visakhapatnam against developing another steel plant and developing the port.] Symbolically, few MLA from one of their castes has been elected. There is also political fragmentation within castes. For example, the leadership of the two boat owners' associations in Kakinada is divided by political party affiliation. More crucially, the weakness of the state legal systems to regulate

and to enforce their legislation mirrors the political weakness of fisher communities and the limited resources allocated to fisher issues.

The perception that fishers are separate from the main stream of society was poignantly expressed by many. The following is an example given by the head of the *Kula peddhalu* (caste elders) of one village:

> We are BC [Backward Caste] Caste . Vadabalijas are primarily fishers, their secondary occupation is trading. Other communities [castes] in the village do not fish and have contact with other communities. From their contact with each other, they learn and have a wider knowledge. Vadabalijas are not clever because they are isolated and totally dependent on fishing. We gain knowledge from contact with others. From our forefathers we are doing fishing. Therefore, socially, educationally, economically and politically, we are backward in this village [Mulapeta] in comparison to other castes in the village and in comparison with other fishing villages.
>
> […] Other communities, in most areas, are settled in towns and cities and plain areas. Fishers are settled mostly on sea and sand. Their total life is in that area. We are not using good land. We only concentrate on sea resources. But we help the Government of India through fish exports. The Government only benefits the people living on the plains, not us. There is no recognition of the community because we are facing so many problems but do not have political representatives. Thus we are continuously backward. No fisher political MLA has come to the village to understand our problems.

Furthermore, there is no unity among the fishers. An indication of this is that the Vadabalija perceive themselves as more backward than the Agnikula Kshatriya. The head of the caste elders in another village explained that:

> In East Godavari, the Agnikula Kshatriya are the dominant fishermen because they are city people, educated, and some MLAs and MPs are from Agnikula Kshatriya. At one time, the Fisheries Minister was from the Agnikula Kshatriya (Malladi Swamy). Presidents

of the boat owners' associations are Agnikula Kshatriya. Ship loading barges association officers are also Agnikula Kshatriya. And government is giving oil subsidy for boat owners which mostly benefits Agnikula Kshatriya. At one time there was a proposal for the construction of a fishermen community hall at Dummelapeta; but pressure of Agnikula Kshatriya MLA had it built in Yetimogha, an Agnikula Kshatriya area.

Compared with Agnikula Kshatriya areas, Vadabalija areas are not developed. This is the reason for the domination of Agnikula Kshatriya. The Agnikula Kshatriya's leaders are using other fishermen castes for support; but they prevent them from developing. So, Vadabalija are backward in comparison with Agnikula Kshatriya. The Agnikula Kshatriya have sona boats, trawlers, etc. But most Vadabalijas are using traditional fishing. They have developed less. The Vadabalija changed from cotton to nylon alivi and from karra teppa to fibre teppa. These are the main changes in Vadabalija fishing.

These negative self perceptions should be placed in a wider context. At the time of research, the Vadabalija had recently refused to support the Agnikula Kshatriya candidate for MLA. As a consequence, no candidate from a fisher caste was elected. However, it is another indication that the Vadabalija are developing a self-awareness of the reasons for their relative economic and political weakness in comparison with the Agnikula Kshatriya.

Kakinada, January 18, 2004. The fishermen community, which has considerable population in Kakinada, Sampara and Thallarevu Assembly constituencies, and has been playing a major role in deciding the outcome of the elections all these years, seems to be heading for a split this time

Among the 16 fishermen castes and sub-castes, people belonging to Agnikulashatriya were able to enjoy political power all these years, with the support of other sub-castes including Vadablija, Suryavamsi and Pallekaru. Except Prof. B. Ramachandra Rao of

> Viskhapatnam district, no one from the Vadabalija sect has been able to come to position of either MLA or MP.
>
> Even in East Godavari district, the former MLA from Sampara constituency, T.S.L. Naicker, or Malladi Swamy, former Minister, who represented Kakinada Assembly constituency or Vanamadi Venkateswara Rao who was the Kakinada MLA till recently all belong to Agnikulashatriya sect. Vadabalijas, who constitute nearly 62 per cent of the fishermen population, for the first time have realised the need for a fair deal to them in the election by way of allocation of a ticket for their community… With the assembly elections fast coming up, the efforts of the Vadabalija community have been stepped up for achieving recognition and independent political identity (The Hindu, 19 January, 2004).

Although they are relatively weak politically, both castes do have some power. Evidence for this is government financed programmes to ameliorate their standard of living, such as grants for improved nets, boats, fish processing facilities and housing. Limited those theses programmes are, they do indicate that fishers have made their problems known.

The first part of the chapter concerns the small-scale fishing legal system. A case study of one village, Mulapeta, where shore seines are the dominate fishing mode and where more intensive fieldwork was done, will be presented. Shore seines require the most precise regulation which re-enforces the power of the caste elders. The case will illustrate how enforcement of this legal system is embedded in wider social, religious and political relations. The case will also illustrate both the strengths and limitations of the small-scale legal system and it will provide lessons for community-based management systems. The adjacent villages of Uppada and Konapapapeta show a similar pattern of strong enforcement of small-scale fishing legal system. In addition, this legal system is active in most marine villages north of Kakinada. The following section is on the regulation of disputes between different modes of small-scale fishing. The second part of the chapter is a description of the non-state legal system of mechanised boats. The last part will discuss dispute resolution between these two non-state legal systems. A stakeholder analysis of will be used to illustrate the perspectives of fishers in these two non-state legal systems.

4.1 SMALL-SCALE FISHERES

4.1.1 Who Is In Charge?

There is a well developed structure for regulating fishing and resolving disputes which focuses on the Caste *Panchayat* of elders (*kula peddhalu*).[8] The first tier concerns fishers from the same village, or hamlets within a village. If both parties go to one elder and if they mutually agree on his decision, there is no need to call other elders. If the disputants go to two different elders, the dispute can be resolved by these two, if the parties agree. If it is not settled, a public meeting of all the caste elders in the village will be called. In most villages, these meetings are held near the Rama Temple.[9] This symbolises the relationship between elders' authority and religious identity. These meetings are usually held on a Thursday, the fishing holiday for most small-scale fishers along the coast.

The second tier deals with management and dispute settlement that involve fishers between two villages. The head caste elders from both villages sit together in either village. If both parties are not interested in going to the other's village, they will meet at the border between two villages.

For disputes which cannot be resolved, elders from other villages are called in to mediate. This is a third tier. These additional mediators are invited because of their personal reputations for adjudication. On a more formal level, there are sub-district sanghas. For example, there is a 33 village sangha involving villages in the north of the district and the adjoining district. According to their president, the constituent member villages are based on marriage alliances. Similar sanghas are reported to exist among the Vadabalija villages around Uppada[10], although its organization seems less formal than the 33 village sangha. Moreover, the sangha is only called to resolve specific disputes, for example, the use of the ring net (see below).

The caste elders in a village or hamlet represent all the lineages of the Vadabalija. The most influential tend to be those who are financially more secure. However, this is not the sole criterion. Many are ordinary fishermen. They gain respect, which is a major source of their power, by being seen to make just

decisions. If one of the disputants is an elder, another elder will decide the case. If a dispute involves one of their close kinsmen, however, it is understood that this is not a reason for disqualification to be involved in a settlement. The elders of the opposing side will also be present. This is not to say that some do not grumble that there is a 'class' element in their decisions. Rather, that on the whole there is compliance.

Although the decisions of the elders are enforced with sanctions, the fact that there are different tiers of adjudication underlies the fact that not everyone agrees with the decisions of the elders. Some disputes are taken to the Police or the District Collector when one or more of the disputants are not satisfied. One Vadabalija elder in Mulapeta explained that most disputes in fisher communities are settled by fishers only. This is because fishing has different practices and that this type of special knowledge is known only by fishermen. Police Courts do not have this knowledge, only legal [land based] knowledge. When a disputant does not accept the ruling of the caste elders and reports the case to the Police Courts, the total Vadabalija community will boycott that person until he complies with the Vadabalija elders' decision. In addition, there is also a tendency for the police and the civil judiciary to refer these cases back to the council of elders. This suggests that the informal system is acknowledged by the formal state system. And furthermore, it also reinforces the authority of the elders.

Another noticeable feature is that the caste elders are careful not to try to impose adherence to any rules that are not generally seen to be 'reasonable' by the community. For example, the leader of the caste elders in Mulapeta told me that he could not expect fishers to adhere to the state fishing ban for more than a few days because they have families to feed. In another village, an elder told me that he was attacked by other fishermen when he tried to impose the government's fishing ban. As one Mulapeta Panchayat Raj member (a shore seine crew member) told me: 'How can elders impose rules if people are poor? The present is the problem. Who can think about the future? People will react against the caste elders if they stop their fishing'

There is variation in the ability of the caste elders to enforce some rules depending on the dominant mode of fishing. The power of the caste elders appears to be strongest with regard to regulating shore seines (*alivi*) because their use lies within the territory of the village. More than with other modes of fishing, shore seines

are dependent on strong regulatory institutions which reinforce the power of caste elders. In Mulapeta, shore seines are the dominant mode of fishing. Stringent rules are applied to shore seines, but the rule concerning the seasonal fishing ban is not stringently upheld. The dominant mode of fishing in both Uppada and Konapapapeta is boat fishing; since a large proportion of boat fishers migrate seasonally to other areas, this in itself would weaken the relative power of the caste leaders. There is comparatively little seasonal migration with shore seines. Furthermore, boat fishing does not require the stringent management that shore seines do. On the other hand, with regard to the state fishing ban, the fishers from Uppada and Konapapapeta said that it was enforced in their villages for both shore seines and boats.

Mulapeta is co-terminus with its administrative village council (Panchayat Raj). The fishing caste elders have a strong influence on the village council; and, in fact, for the past twenty-five years, the elected village head (*sarpanch*) has been a Vadabalija. The most influential caste elders are shore seine owners. A few less influential caste elders own non-motorised boats (fibre teppas), one of these was previously an owner of a motorised (fibre engine) boat.

In contrast, Konapapapeta is perceived by some of its fishermen to be politically dominated by agriculturally based villages, and is only one of several villages that comprise the administrative village to which it belongs. This was the reason given by one kula peddha as to why the village panchayat gave permission for thirty-seven shrimp hatcheries to be built in Konapapapeta. However, the President of the Panchayat is from a Scheduled Caste and the Vice President is Vadabalija which indicates that these castes are more dominate than agriculturally-based castes. Furthermore, most of their caste leaders have moved out of fishing, and the compensation from the hatcheries was given for the Vadabalija Fund in Konapapapeta.

Less is known about the position of the Vadabalija elders in Uppada. Salagrama reports a well-developed community-based management system in Uppada (Salagrama 2005: 123). And it is known that the caste elders Uppada are actively involved in dispute settlement involving other villages.

In these three adjacent villages, the rule of the kula peddhalu is strong. There appears to be a strong association of their power with village funds that are closely linked with Rama, and a number of other religious deities. Furthermore, all these

villages have benefited from housing schemes, grants for improved fishing technologies and facilities for fish processing.

The legal system of the small-scale fishers appears strong in most villages north of Kakinada. This conclusion is based on the active participation of their elders in adjudication in disputes. However, counter evidence was cited above concerning the elder who was beaten by his village fishermen when he tried to enforce the seasonal ban on fishing. Furthermore, given that their 'traditional' sources of authority are declining, Salagrama's conclusions that the control of the caste elders is waning in general (Salagrama 2005: 124) is probably correct.

The case of Mulapeta will give insight into the possibilities and limitations for compliance with fishing rules. The capacity of caste elders to enforce fishing rules is dependent on a number of factors: a) village power structure in relation to other castes; b) requirements of the fishing mode for regulation; c) migration patterns; d) dependence on fishing or fish trading; and e) embeddedness in religious institutions which undergirdle identity.

4.1.2 Case Study of Mulapeta

Like most of the fishing villages, Mulapeta is a multi-caste village. The Vadabalija represent about forty percent of the residents[11], followed numerically by the weaver caste with approximately eleven percent. The village council had been dominated by a few Brahman caste households until twenty-five years ago, when a Vadabalija was elected *sarpanch* (president) of the Village Panchayat. The position has been held by a Vadabalija since then. The change in political dominance coincides with the introduction of nylon nets for shore seines in the mid- 1980s which greatly enhanced the economic fortunes of the Vadabalija and enabled many to invest in land and other resources. Although the Vadabalija see themselves as weak, in Mulapeta they are in a relatively strong position politically. Their rise in power is associated with the creation of a Vadabalija village fund.

Vadabalija Village Fund

In 1968-69, KKR became a caste elder in Mulapeta village after completion of his education to the 11th standard. He was the first Vadabalija in Mulapeta to be

educated to this level. In 1970, he established and registered a village development committee for Vadabalija.[12] The main function of this committee is to collect funds to support an annual Sri Rama Temple Festival. Although the Rama Festival is for the entire village, it is supported solely by the Vadabalija. Other castes have similar festivals for different Hindu gods to whom they have built their own temples. And hence, the creation of the Rama Festival can be seen as an instrument for creating a positive Vadabalija identity, as well as symbolic capital.

The fund receives about Rs. 300,000 per year in contributions from fishermen. Each shore seine owner and boat owner must contribute an annually agreed sum to the fund. The sum varies according to the comparative wealth of the owner. Shore seine owners contribute around Rs. 10,000 each; while non-motorised boat owners donate about Rs. 2500, some as little as Rs. 1000.

It is compulsory, regardless of the religion of the fisher, to contribute. When the sole Christian shore seine owner protested, he was threatened that he would not be allowed to fish if he did not contribute. There are approximately 200 Christian fishers in Mulapeta. It is noteworthy that several of the fibre boat owners are Christian. Consequently, they fish on Thursday, but not on Sundays.

A Thursday ban is strictly enforced for shore seines regardless of religion, although poor shore seine fishers may be given permission by the caste elders to fish in exceptional circumstances. Boat fishers are free to choose whether or not they fish. On several Thursdays throughout the year, fishing is done and the entire catch is donated to the fund. Therefore, although the owners agree to make contributions, all fishers, in effect are contributing. In addition, if there is a huge fish haul, some of it will be donated for the fund. Fish traders are also expected to make contributions. Thus the fund strengthens the identity of the Vadabalija and also strengthens the power of the caste elders who decide how the funds will be spent.

In addition to the Rama Festival, the fund is also used for a number of welfare activities:

1. The house taxes of Vadabalija are paid from the fund, irrespective of house size.
2. Donations are made for school building construction which benefits everyone in the village.

3. During an out break of diarrhoea in the mid-1980s, the fund was used to buy glucose bottles for the health centre.
4. When one of the shore seines was burnt by an unknown person, the fund lent the owner money to buy a second-hand net until he received compensation from the government authorities. This type of help is only given to those who do not have financial resources to help themselves.
5. The fund is not used to support poor fishermen families, unless there is an emergency such as funeral or hospital expenses.

Colony

The strength of the Vadabalija is illustrated by their allocation of housing in a new hamlet further from the shore, but adjacent to their old village. Around 1990, the government sanctioned 450 *pattas* (rights to build a house on a plot of land) to people in the village. The 22 acres required was taken from a Brahmin family. Initially, there was no quota for Vadabalijas, only for the scheduled castes. The *sarpanch* (Panchayat Raj Headman), a *Vadabalija*, was able to get 253 houses sanctioned for the Vadabalijas, and the remaining 200 went to weavers, *settibalija* (toddy tappers), *yadavas* (herdsmen) and to other communities. Rs. 8000 was given by the government to build each house which was insufficient. The community applied for a loan of Rs. 350,000 for women dry fish traders. This money was used to supplement house construction which averaged Rs. 13.500 per house.

Initially, the government sanctioned houses for fishermen in Uppada (400) Ammenabad (170), Konapapapeta (150); but none for Mulapeta. This indicates the strong political influence of these communities. After petitioning the Collector of East Godavari District, the elders of Mulapeta were able to get 253 houses sanctioned for Mulapeta fishermen as well.

Settlement of Disputes

Most disputes among fishermen are resolved by themselves. However if there is a dispute, the elders call a village meeting to find out the facts. Afterwards, they make a decision. If it is a small dispute, the settlement is made by an oral expression of apology. If it is big dispute, the settlement is a fine. The examples of

big disputes are: a) if a net is cut with a knife etc., or b) if a large group beats a small group because they are weak. The reason behind imposing a fine is to control aggressive behaviour and maintain the cordial relationship among fishermen.

The amount of the fine is based on the degree of the loss or damage of the sufferer. For example, if a person is wounded, his net is damaged and there are other expenses such as those involving the police cases, the elders impose a fine that will cover hospital charges, loss or damage to property, and the police case expenses, etc. The fine in such cases may be between Rs.5,000 and Rs,20,000. Mostly, the elders do not impose a fine if there is no loss or damage to the other party.

Imposition of Restrictions by caste elders

The leader of the Vadabalija caste elders in Mulapeta described how they impose their decisions:

> Suppose the fishermen and caste elders decided that on a particular day the fishermen of this village will not go for fishing. We will all stand on that decision. If anybody does not follow this decision we boycott him, because these are the restrictions for the unity and to maintain the moral support of the fishermen. So to maintain unity among the fishermen, these types of restrictions are essential.
>
> Suppose that one fisherman is in trouble in marine sea. Water is damaging his net or boat or any other problem. At that time, he gives some hand signal to the fishermen who stand on the beach. Immediately the fishermen must go and save him. Otherwise he will be liable. This is the sense of morality. For example, recently two *navas* were sunk at sea on different occasions. At that time, the neighbouring *alivi* (shore seine) fishermen went there and helped them. Fishing is not an independent activity like other activities. It is a group work.
>
> In disputes heard by the caste elders, if the party accepts they are wrong, we leave them without imposing any liability. If he does not accept he is wrong, we punish him with the imposition of fine etc. If the party does not agree to pay the fine, we the fishermen boycott them.

The boycott in olden days meant we do not give them drinking water, do not talk with them, do not give fire or other essentials, do not help if he is in trouble, and do not help in fishing activities. But nowadays we are not imposing such type boycotts. Because they have some education, communication facilities are developed among some of our fishermen. The present system is that if the party does not agree to give compensation to the aggrieved party, we the Elders and fishermen go and give the complaint to police against the wrongdoer. But it is in very rarest of rare cases. Most of our decisions very honest, genuine and useful for the maintenance of unity among fishermen, however, this type of situation may not arise.

4.1.3 What are The Rules?

The rules vary with the technology. Hence, a description of the rules for each mode of fishing will be made in separate sections. However, there are a few general principles. Equity is a major principle. Hence, most disputes occur when there is infringement on this principle, for example, using fishing technology which gives an 'unfair' advantage to one mode of fishing (the use of trawl nets or ring net in inshore fishing territory). Another example is that all shore seines in the same village should be the same length. Another general principle is that who ever has laid his net first, can fish until he is finished without the disturbance of the another net being laid. Most disputes arise due to damage to fishing gear caused by not following this rule.

Fishing Territories -- Non-state and State Rules

Shore seines have rigorous territorial rules based on village land boundaries. There are also land oriented rules governing river fishing. These will be described below. The fishing territory of small-scale boat fishers is mostly limited to the technical capacity of their boats. However, they should not fish beyond 8 kilometres in Andhra Pradesh waters according to the Fishing Regulation Act.

As a consequence of pressure from Orissa fishers, the Government of Orissa has banned Andhra Pradesh fishers from their waters, hence there is both non-state and state restrictions on fishing. The position of Tamil Nadu is less clear, although

their fishers certainly do fish in Andhra Pradesh. Within Andhra Pradesh, fishers from some districts are trying to impose restrictions on fishers from other districts. For example, in Machillipatnam there have been disputes with fishers from other districts. The view of a shore seine owner in Mulapeta from where no one migrates to Machillipatnam underlines the general principle that the sea belongs to everyone: 'Does the sea belong to Machillipatnam people? If so, then why does not the sea belong to us here?'

The greatest advantage of motorised boats is that fishing can be done further out to sea. However, many boat owners are finding it difficult to finance the additional costs of diesel for their boats. Hence, they fish closer to shore.

Boat modes of fishing require less precise rules. For example, you can lay your nets anywhere, provided they do not interfere with nets already laid. Who ever has spread his net first, has claim to fish in that area until he completes his fishing. When disputes are not settled by the fishers themselves, the caste elders are called to adjudicate. In theory, the fines imposed must be paid or the fisher is debarred from the community.

When fishing at night, lanterns are placed on a buoy at either end of the net. Although the boat fishers said that they are adequate, the researcher thinks that they are difficult to see. During the day, black flags are put on the buoy to demarcate the end of the net. These too are difficult to see.

Non-motorised boat owners said that there were no restrictions about where they could fish. They could go any place in any direction or distance. Most fishers from Mulapeta fish close to Mulapeta; but some travel further along the coast as far as Pentakota in the north and Bhairavapalem in the south. Where they go is determined by the wind, and general weather conditions.

Thursday Fishing Ban—Non-state Rule

One caste elder in Konapapapeta said that there has been a Thursday holiday for all boats and shore seines for more than one hundred years. The Thursday fishing ban is often described as a day for god. In fact, this holiday also serves as a time for personal business, repairing nets and boats, and meetings that concern the fishing community. This is a village level rule that varies from village to village. It also

varies with mode of fishing. However, generally, Thursday is a holiday for marine fishers in East Godavari District. In some villages, Sunday is a holiday for Christians.

In Mulapeta, it is fully enforced with regard to shore seines. If a shore seine fisher is experiencing tremendous financial hardship, the elders may give him and his crew permission to fish. The 'free' day from marine fishing is seen as an opportunity to fish in the estuary, where the Agnikula Kshatriya also fish on Thursdays. Most boat owners and crew in Mulapeta said that there was a Thursday ban on fishing. However, others said that they are free to fish on Thursday, provided that they make donations to the village fund.

In contrast, in Konapapapeta and Uppada, Thursdays are normatively a fishing holiday for all modes of fishing. This variation underlines that boat fishing is the dominant mode in these two villages. Furthermore, there is perception among mechanised boat fishermen that there is a general ban on fishing on Thursday among fishers north of Kakinada. This is the reason they give that there are no restrictions on mechanised boats to fish in Kakinada Bay on Thursday.

On the Thursday that I travelled along the northern coast of East Godavari, in December, 2004, a striking pattern could be observed. Many boats and some shore seines were fishing from Kakinada to Uppada. However, there were few boats and no shore seines fishing from Uppada to Danaipeta.

Ban on Fishing from 15 April-30 May—State Rule

The enforcement of the ban seems to vary with village, according to the predominate fishing mode. In villages where there are many boat fishers, the ban was said to be applied. Unfortunately, fieldwork was not done during the ban period; and hence, this cannot be verified. However, it was admitted by the caste elders in several villages that the ban could not be enforced: the ban for shore seines is not applied; and the ban for boats with engines follow the ban for 5-6 days, after which time they need money and fish.

The case of the caste elder who was beaten up by the fishermen in his village when he tried to enforce the ban has been reported. In Mulapeta, where the caste elders are relatively strong, the head of the caste elders reported that they could impose the ban for one or two days. 'We cannot prohibit fishing for 1-2 months, if there is no alternative source of livelihood. How can sarangi [owners] maintain 30

crew and 20 labourers during this ban?' His view was that the government must give an alternative source of income during the six week ban period. In Pondicherry, Rs. 350 plus one bag of paddy (100kg) is given to each fisherman. In his view, the failure to impose the ban is a consequence of the economic backwardness of people. Therefore, the government must give an alternative. [It should be pointed out that a Savings Relief Scheme was in operation at the time this interview. This will be discussed further in Chapter 5].

In contrast, in Konapapapeta, enforcement for all fishing – shore seines, motorised and non-motorised boats is claimed by several of the caste elders and fishers. The caste elders' leader there told me that there has been a ban since 2000. In the 2002-3 fishing year, some fishermen from different villages went fishing during the ban. In total, the boats caught ten tiger shrimp brooders. One boat belonged to Konapapapeta. The elders of all the villages confiscated the proceeds which were Rs. 2.4 lakhs, and put it into a common fund held at Uppada to be used for help in common problems of fishermen for the whole area. Rs. 25,000 has been spent for the campaign to designated Vadabalija as a Scheduled Tribe rather than as a Backward Caste. Since 2002-3, the ban has been followed.

Evidence in contradiction to strong enforcement was given by numerous boat fishers. Many told me that there was good fishing, especially of shrimp during the ban. This was said to support their contention that mechanised boats are the reason for the decline of shrimp and fish. It also suggests that they are fishing during the ban. Complaints were heard from boat owners that they did not get any assistance from the government during the ban. However, the same informant was one of the boat owners from Uppada who was receiving aid from the Savings Relief Scheme for 2004.

In Konapapapeta, several caste elders said that there is no fishing during the ban, also that there is no fishing for shore seines. This underlines a notion of equity. One elder said that the aims of the ban could not be met as long as the hatcheries – there are 37 in Konapapapeta – continue to discharge their effluent into sea during the ban period when the fish eggs hatch near shore.

> The fishermen follow the ban in Konapapapeta. However the government's aim is not fulfilled. The government's opinion is that in May the egg is hatched and develops in this month. Fishermen stop

fishing; but hatcheries are dumping chemicals into the sea during that period. Therefore, there is no point in stopping fishing. The Fisheries Department has not reacted to their complaints because the hatcheries are owned by relatives of political leaders.

There is an assumption among fisheries officers that the small-scale fishing practices do not contribute very much to resource degradation. As a consequence, the Andhra Pradesh Fisheries Department excluded small-scale fishers from the ban in 2004. Interestingly, very few fishermen interviewed were aware that the ban no longer applied to them.

Mesh Size -- State Rule

According to the 1995 Fishing Regulation Act, fish nets must be larger than ½ inch (12.7mm). There seems to be compliance with this rule among small-scale boat fishers, but not the shore seines. The central portion of the shore seine is between 8-10 mm. Owners, many of whom are kula peddhalu, claim that two of their major target species (royya pottu and nettalu) could not be caught with a larger mesh size.

Ban on Seed Nets -- State Rule

Most of the fishers interviewed, including those using the seed net today, realise that it is damaging future fish stocks. In fact, most of them see it as the major reason for the decline in fishing stocks. I was told repeatedly, almost as an axiom, that if the ban were implemented, there would be a 50 per cent improvement on the fish population. They know that there is a government order on the prohibition of the seed net; but there is no effective implementation. The elders in Mulapeta, for example, never objected to the use of seed nets. And the Fisheries Department Officials' implementation has been largely limited to holding educational meetings which certainly have raised awareness of the problem.

There has been, however, a drastic decline in the use of seed nets. This can largely be attributed to the decline in the value of shrimp seed due to the fact that the majority of seed is now supplied by the shrimp hatcheries. Nonetheless, many are continuing to use the net; and it was seen in use in most villages. Traders come daily

to buy the seed in most villages. They tend to be used by the poorest members of the communities.

The leader of the caste elders in Mulapeta explained why elders are not imposing the ban on seed net fishing:

> Initially, there was a great demand for shrimp seed because hatcheries people and other merchants bought the tiger shrimp seed for one rupee per seed. At that time all the castes, madiga, mala, padmasali and other, concentrated on seed catching along with fishermen by using seed nets. Presently, the rate for seed has decreased to 15 paise per seed. So other castes dropped out from this catching. And our fishermen also are no longer using the seed net regularly. It is used only when there is no other alternative income.
>
> In regard to the imposition of ban of seed net fishing by our elders, this is not the practice of only one village. There are a number of fishing villages throughout this coastal area. If we the elders impose a ban on seed net fishing in this village, the fishermen of our village may ask us questions like: what will you do about the neighbouring village seed net fishing? Why are you banning the seed net fishing in this village only? So it is not the matter of one village. It is the matter of all fishermen throughout the coastal area. We are the elders of this village only; but not the elders of all the coastal fishing villages. Therefore we cannot control our village fishermen alone. And at the same time, the imposition of ban on seed net fishing may not be successful in all villages. In some villages, it may not be implemented because of different reasons. Suppose if the elders of some villages may not be powerful and they may not control their village fishermen in all activities. So it is the question of total fishermen. Therefore we the elders of some villages cannot impose a restriction.
>
> However, the government may prohibit the seed selling, to control the seed net fishing indirectly. If there are no buyers, our fishermen also do not use the seed net for seed fishing. So government alone can do it. We cannot do it. Our imposition of ban may not be

successful, and there is chance of failure. Government pressure must be there for the success of seed net banning.

His explanation illustrates three issues that will be recurrent: a) the principle of equity; b) the range of the law; c) the limitations of the authority of caste elders; and d) the desire for government implementation of laws that they themselves perceive as sensible.

Rules for Marine Shore Seines – Non-state Law

The fishing area is circumscribed by the length of the net from the shore. Along the northern coast of East Godavari District, marine shore seines vary in length from 300 to 600 baralu. A *bara* is the span between finger tips of outstretched arms. Established practice among Fisheries Department officials is that a *bara* is equal to a fathom which is six feet two inches or 1.85 meters[13]. The Head of the caste elders in Mulapeta said that the owners made an agreement about the maximum length in order to ensure equity. During 2004, the length of nets in one village, Mulapeta, was between 450 and 600 *baralu* (833-1110 meters). In Konapapapeta, according to the Head of the caste elder, there is no agreed length. This contrasts with the idealisation made by the Mulapeta Head that the length is equal in order to ensure equity.

A rope of 400 *baralu* is attached to one end of the net and a rope of 600 *baralu* on the other end. Thus, the total length is about 3000 meters, which requires over three hours for fifty men to pull into shore. Each rope is extended another 1000 meters to catch some species, for example anchovies; this requires about five hours to pull in the five kilometres net.

The net is laid on the diagonal from the shore, thus explaining the need for the ropes to be different lengths. It also explains how disputes can arise between shore seines when one net drifts into the territory of the other. Gradually, it is pulled parallel to the shore by the crew and the current.

Unlike many shore seines, those used in the research site are a flat, elongated net, without a pouch or bag. As the net is pulled in, a pouch is formed by the weight of the fish. The dimensions of one net that was measured are: length: 925 meters (500 baralu); width in the centre: 24.6 meters, tapering to 7.3 meters at the ends. In

the centre section which was 13.2 meters long and 24.6 meters wide, eight millimetre mesh was used.

Sandy beaches and sea bed are required to use a shore seine. Each village has territorial rights to fish from the shore within its boundaries. Within the village boundaries, fishing places (*padu)* are demarcated on the beach. In Mulapeta, there are eight operating *padu*, each is approximately half a kilometre in length. The eight *padu* are used in strict rotation by the fifteen shore seines belonging to this village. Each haul is also called a *padu*. On a given day, eight shore seines will be in the first padu; the remaining seven will be in the second *padu*. If the fishing is good, there may be additional *padu* during the same day following this rotation. Their positions will be the opposite the following day. Furthermore, the site of the shore seine's *padu* also changes everyday. For example, a shore seine that fishes in the first *padu* and at *padu* site three, will fish during the second *padu*, at site four the following day. The sequence is fixed and does not account for those who did not fish the previous day(s). [In addition, there are rules applied when less than 15 nets fish on the same day. However, this is too complicated to explain for the purposes of this report]. Each year the number of shore seines changes. Hence the rotational sequence must be decided before the start of each fishing year by the shore seine owners and the caste elders. Occasionally, the location of fishing places (*padu*) needs to be adjusted in response to changes in the sea bed. The rules about rotation are precise to ensure equity.

Although there is tremendous erosion in villages along this coast, the width of the beach is not the major problem. Numerous buildings have been submerged due to erosion in many villages which makes dragging the nets over the sea bed impossible at those sites. Uppada has been the most affected. Also shore seines can not be laid where there are moored boats off shore. Again this affects Uppada the most. In Konapapapeta, the pipes from thirty-seven hatcheries have obstructed the beach resulting in seven out of thirteen shore seines stopping. Mulapeta has suffered the least since only one shore seine *padu* site has been lost due to erosion, causing a temple to be submerged.

In principle, the beach territory of shore seines is co-terminus with the coast of the village or hamlet. Fishers from other villages can use the *padu* of other villages only when the local village fishers have finished their *padus*. In several cases, *padu* of another village are regularly used, especially when no one owns a shore seine in

that village. There are other cases where villages are buying shore seines and reclaiming the *padu* rights of their village. In adjudication by inter-village Vadabalija elders, the territorial rights of the village are paramount.

Rules for Crew-owner Relations – non-state rules

Shore Seine Crew-Owner Relations—Mulapeta*:* Each shore seine has a crew of about 30 men who have a contract to fish for an owner for the entire fishing year – roughly 1st of June to end of May.[14] The religious day of Mannemavasa is the first day of the fishing year. Before the start of the fishing year, a meeting is held with elders, shore seine owners, and crew to decide on the advance that will be paid to the crew. The decision is unanimous, taking into account the following: fishing income during the last year, the economic status of the owners, the welfare of the crew, the problems of the crew and owners.

During 2004, the non-repayable advance, called a *katnam* or dowry, was Rs. 6,500 per crew member in Mulapeta. (The advances vary with village). The advance is the same for all crew working in all the shore seines to ensure equity. This is the stated principle, although there is some indication that some owners pay a bit more. Around 1994, a uniform advance was introduced in Mulapeta. The reasons were that there was much competition among the owners for crew due to the increased numbers of shore seines stimulated by the government grants schemes to help fishermen buy shore seines. Previously, owners would pay differential advances in relation to the age, experience, etc. of the crew. This was detrimental to the financially weak owners. It also created disputes between the crew and the owner. Crews would refuse to work unless the *katnam* was increased.

The crew is recruited by the owner and the head of the crew, the *peddha rythu*. Obviously, the strongest and the most cooperative and knowledgeable are sought. There is also a preference for relatives. There is one Christian shore seine owner in Mulapeta. Most of his crew are Christian. However, religion is perceived by informants as immaterial. Crews want to work for those shore seines that are most likely to get good catches, that is, those whose owners can afford to keep the shore seine in good repair. As one shore seine owner reported, 'It depends upon the economic status of the owner. If the owner is financially sound, he will appoint who

he wants. If the owner is financially weak, there is no question of willingness to choose'.

In addition to the advance, crew members depend on the owner for consumption credit for the fishing year. These can amount to Rs. 20,000 per crew member each year. Some owners charge 2-3 percent interest, others do not. Some owners give their crews rice if the fishing is bad, while others include the rice as part of the debt. These practices discriminate against financially weaker shore seine owners, who cannot afford to be generous. These additional advances must be repaid. A crew is not free to work for another shore seine owner, until he has repaid his debt. However, this does not establish the stable patron-client relationship that one might expect. The majority of crew move from shore seine to shore seine from year to year. This partly reflects the shortage of crew and the strong bargaining position of the crew, as well as the weak position of several of the shore seine owners.

A common reason stated by crew for moving to another shore seine is that the owner does not treat them well. Not treating well, usually means that the owner is rude to them. However, some owners beat their crew. For this the elders will impose a fine of Rs. 500-2000 which goes to the Vadabalija Fund. Some crew said that they moved into boat fishing for independence and less hard work.

The crew's duties are to be available for fishing whenever the shore seine fishes, loading the net onto the boat, sorting and carrying the fish to the market area, and helping with repairing the net. After costs to labour, and the fish are sold, the crew shares the proceeds fifty-fifty with the owner and are usually paid the same day as fishing.

In addition to the crew, the shore seine needs twenty additional men to help pull in the net. The labourers are paid Rupees 20 per haul, i.e. the owner must pay Rupees 400 for labour each time they fish. If there is good fishing, labourers usually work two hauls per day. The labourers may be recruited by the *peddha rythu* the evening before, or they may just ask on the beach before the shore seine starts fishing. Sometimes, they help to load the net onto the boat. In contrast to the crew, the labourers are appointed for one *padu* only. Payment is during the evening, after the fish have been sold. Credit from the shore seine owner does not link a labourer to a particular owner. Some labourers said that they prefer the freedom that being a labourer gives them, in comparison with the crew.

Shore Seine Crew-Owner Relations -- Konapapapeta*:* The *katnam* is Rs. 10,000 per year. The high *katnam* is due to the scarcity of labour. Those who work in hatcheries were paid Rs. 100 per day, in contrast to only Rs. 20 per *padu* for shore seine labourers. Hence, shore seine owners try to engaged as many crew as possible.

Boat Owner and Crew Relations: The *katnam* for non-motorised boat crew in 2004 was between Rs. 4000 and Rs. 7,000 in Mulapeta, depending on the capability of the crew. Most of the owners said that the *katnam* was Rs. 4000. In addition, the crew gets a share of the fish. The catch is divided into seven parts: the crew get four shares; the nets, boat, and owner get three parts. If three crew and the owner go fishing, the owner will get three shares plus one share for being a member of the crew. Any damage to the boat or net is the owner's responsibility. As with shore seine owners, the boat owners are expected to advance additional money to their crew when they are in need. The main duty of the crew is to be available whenever the boat fishes.

The *katnam* for motorised boats in Uppada, according to one motor boat owner is Rs. 4000 for the fishing year from April to April, i.e. from Kottamavasa. [Note that this coincides with the beginning of the ban!].Rather than a non-refundable advance (*katnam)*, some crew prefer a refundable advance (*vadakam)* of Rs. 10,000 to Rs. 20,000. The catch income is divided into 16 parts: 10 shares for the crew (one share each); and six shares for the boat (two), net (two), and engine (two). Some of the income is retained by the owner to buy petrol. Later, the deducted amount will be re-reimbursed whenever they have good fishing.

There are frequent disputes between the boat owners and their crew with the result that crews are not stable from year to year. The relations between joint owners are often difficult to maintain. It is common for two fishers to buy a boat together. When one partner drops out, this places the remaining owner in great financial difficulty. Over the years, the Fishing Department has initiated a number of loan schemes to encourage a group of fishers to a buy boat together. An example is the post-1996 cyclone scheme in Konapapapeta where groups of five fishers were given grants to buy motorized boats. The idea is good; but in practice, there are difficulties with joint ownership.

4.1.4 How are Intra-group Disputes among Small-scale Fishers Addressed and Resolved?

Conflicts between Shore Seines (alivi) in the Same or Adjacent Villages

Generally, disputes are rare. When there are disputes between two shore seines because one net has trespassed into the *padu* site of the other, it is usually settled amicably, sometimes calling in an adjoining shore seine for adjudication. If there is fighting with sticks or knives, it is usually brought before the caste elders. The *padu* site means the area used on the shore to pull in the net. It can also refer to the situation where one net drifts into the *padu* site of another at sea. The net is laid diagonally to the shore, depending on the wind and current. As long as all the nets are laid diagonally in the same direction, there is little problem. As it is being pulled in, the net becomes perpendicular to the shore. If, however, one net is not laid in the same direction as the others or if it is not kept in the same parallel position to neighbouring nets, the net will go into the sea *padu* site of the adjoining net. The first time this happens, the caste elders will warn the owner. If he repeatedly mislays his net, the owner will be fined by the caste elders. In practice, there is some bullying by those shore seines that are economically stronger in terms of the quality of their nets and the size of their crews. The weaker shore seine owners complain that the elders do not pay attention to their complaints and tend to side with the stronger shore seines.

These same types of disputes occur between shore seines from different villages when their *padu* sites are adjoining, as is the case between Mulapeta and Konapapapeta. If the shore seine owners from two different villages can not settle the dispute, the caste elders from the two villages will meet to resolve the dispute. If this is unsuccessful, neighbouring village elders are called in to settle the dispute.

If there is damage or loss of a net, usually, the wrong doer must pay the damages. Sometimes, the cost for damages is split between the disputants. If there is physical violence, resulting in hospital expenditure, police charges, transport charges, etc, and if the shore seine owner or his crew are the victims and poor, some amount must be collected as damage from the wrong doer.

Generally, any dispute is settled mutually. If the aggrieved person or wrong doer goes to the police station to file a case without trying to settle the dispute amicably in the village, the village will support the other party. It is argued that this is to maintain mutual understanding among fishermen and to prevent them unnecessary expenditure.

In addition to these examples of explicit disputes, there are occasional instances when a shore seine is destroyed maliciously and the culprit is not identified. For example, I heard several cases, one in Mulapeta and others elsewhere, where a shore seine was burned by some unknown person at night. In the case in Mulapeta, the Vadabalija Fund was used to help the owner buy a second-hand net. Symbolically, this suggests a break-down in the legal system.

Conflicts Between Villages About Shore Seine Fishing Territories

Shore seines are often laid in the territory of other villages after their fishers have finished fishing or when their fishers no longer use their *padu*s. Disputes arise when the village fishers reclaim their rights to their village fishing territory. The following case involved adjudication by both the caste elders of several villages, as well as a former Zilla Panchayat chairman. The case was explained by the head of the caste elders in Mulapeta:

> The boundary dispute was between Kotta Kakinada fishermen and Vakalapudi fishermen. Nearly 10 village heads attended the meeting. On behalf of Vakalapudi fishermen, Vakalapudi cinema theatre owner and ex-Zilla chairman attended. In the meeting, the Kotta Kakinada fishermen contended that for many years they had been catching fish in Vakalapudi disputed area. The Vakalapudi fishermen contended that this area belonged to their village even though they were not catching fish in that area from some years back. Previously they had fewer nets. Now their nets had increased. So they claimed to have fishing rights in the disputed area. The question is who is having rights? If it is so, on what basis do they have rights? During that meeting, one of the elders gave an example to the other elders. Vakalapudi fishermen and Suryapeta fishermen some times are fishing in Mulapeta village area. Does our village belong to them? No. Even

though sometimes the fishermen of one village are fishing in other villages, the area does not belong to them. The area belongs to the village fishermen only. The concerned village fishermen have the right to fishing on that land. If they object to the neighbouring village fishermen, the neighbouring village fishermen have no rights to fish in another village's shore. The decision was that Kotta Kakinada fishermen have no rights. With regard to the disputed area, Vakalapudi fishermen have absolute right because it is in their village.

Conflicts Resulting From Using Illegal Nets

At a beach fishing landing centre in the northern part of the district, the local fishers prevented fishers from another village from selling their fish because they had been caught using small meshed nets. The catch was impressive in comparison to the meagre catch of the local fishers. Although the traders were keen to buy the fish, no auction was held. And the traders seemed to accept the sanction by the local fishermen.

Conflict about introduction of ring net

In five villages in Thondangi Mandal in East Godavari District, 14 ring nets have been in use. These nets were introduced from Srikakulam area around 2002 and were promoted by the government. The ring net is said to cost between Rs. 60,000 and Rs. 100,000. One net is operated by two motorized boats, involving a total of 10-12 fishers. The mesh size of the net is less than ½ inch and catches all types of fish. The fishers put the net over a school of fish which, along with the small mesh, gives an unfair advantage to this mode of fishing. Shore seines are prevalent in the area and it is claimed that the ring net is catching fish before they can enter the shore seine. Hence, the majority of the fishers were demanding that the ring net be banned.

In response to complaints from local fishermen, the caste elders in the five villages called a *sangha* of caste elders from 33 villages. However, they could not resolve the dispute either. The issue was brought to the District Collector, who in turned directed the Assistant Director of Fisheries to resolved the dispute. After

consultation with the fishers, a ban on the use of the ring net was made. The ring net fishers explained that they had invested Rs. 100,000 on each net and that they had no other way to earn their living. Therefore, the ring net fishers demanded compensation. Around October, 2003, the concerned villagers decided to contribute Rs. 5,000 to 10,000 as compensation, along with some support from the government (what this was is not clear). At another meeting of the 33 village *sangha*, it was proposed that Rs. 20,000 to be given as compensation to owners of net at festival time and that all 33 villages must contribute to compensation.

Catches had not been sufficient to repay ring net owners. Therefore, the compensation payment had been postponed. After three or four meetings about compensation, the 33 *Sangha* got no positive response from villagers. When the owners started to use their ring nets again, the process was repeated. Then, the ring nets were stolen by other fishermen. In December, 2004, another meeting was called concerning the ring net. The meeting was cancelled. The Secretary of the 33 *Sangha* said that the ring net owners had sold their nets. So the problem had been solved. No compensation had been paid to the ring net owners.

This case illustrates the limited power of the 33 village *sangha*, as well as the state legal system, to resolve disputes. It also illustrates that there is a lack of clarity about the relative hierarchy and responsibilities of different authorities to adjudicate disputes. On the other hand, it illustrates of the power of censure from other fishers to maintain compliance, at least in some circumstances.

Conflicts Between Non- motorised Boats

Normally, who ever has spread his net first, has claim to fish in that area, until completion of fishing. A black, plastic flag about 30 cm square is placed on a pole about 1.5 meters from the surface. These flags are placed on the buoys at each end of the net. Fishers say that black is the most suitable colour because white is not visible if the sun is rising. And red plastic is not available. During the night, a lantern is placed on a buoy which floats on the surface. Therefore the height of the light is only about 30 cm from the surface. During the day and at night, the markers are difficult to see.

The fishers claim that their boats are 4 or 5 kilometres apart. From observation, the boats are, in fact, only a few hundred meters from each other during

the day. At night, when they prefer to fish close to land, there is more congestion. It is, therefore, not surprising that there are daily conflicts between fishing boats.

If the dispute cannot be resolved by the parties involved, it is settled by caste elders. If a fine is imposed, the fisher must pay. In theory, if he does not pay, he is debarred from the community until the fine is paid. In practice, this adjudication is most effective if the fishers are from the same village. How effective it is, in practice, in disputes involving fishers from different villages has not been observed.

Conflicts Between Shore Seine and Non-motorised Boats

The limited reach of the law is illustrated by these conflicts. Sometimes boats from another village throw their nets into the space enclosed by the shore seine. On the other side, one fibre boat owner said that if the shore seine is spread within the boat's net, sometimes the boat's net is damaged. Caste elders can control boat fishers from their own village. When the fishers are from different villages, the caste elders have meetings with other fishing villages in area. Although the dispute is resolved and the boat fishers may agree not to do it again, there is little the caste elders can do to stop the boat fishers from doing it again the next day.

The leader of the caste elders in Konapapapeta explained that the increasing number of boats in their village has led to problems for the shore seines. In his view, the boats catch the fish before they reach the shore seine.

Conflicts Between Shore Seines and Motorised Boats

These conflicts are seen as the most important by the fishers themselves. Surprisingly, they are perceived as a more serious problem than those between the shore seines and the mechanised boats which will be discussed in section 4.3.2. There were about five incidents in Mulapeta during 2002, and none during 2003. Yet, it is perceived as a major problem. So much so, that the former MLA from Kakinada was involved in resolving some disputes and told the motorised boat owners not to fish near the shore seines.

Normally, the motorised boats go around the shore seine, if they see it. Problems occur when: a) they drop their nets within the shore seine; and b) they travel over the net, often damaging it. When the shore seine is damaged, not only

does the shore seine loose some of the fish caught, but they cannot fish again until the net is repaired which usually takes two or three days.

In addition, the motorised boat crews have been reported to threaten the shore seine crew with knives while the shore seine was being laid. The shore seine crew are helpless to do anything because they generally do not take knives on their *navas*.

The reach of the law is weaker in disputes with motorised boats than with non-motorised boats. Shore seines are mostly owned by Vadabalija; while many motor boats are owned by Agnikula Kshatriya, especially from Yetimogha (see Tables 2.1 and 2.2.). It is not possible for caste elders of two villages to resolve these disputes because it is difficult to enforce the rules.The motor boat owner will say that he will not fish in shore seine area and pay a small compensation. Then, he does it again.

Conflicts Between Motorised Boats and Non-motorised Boats

These conflicts are another example of the limited range of the kula peddhalu to enforce the non-state legal system. During any good fishing day, it can be observed that the sea is crowded with boats, although most fishers are fishing at night during this time of year (August – December). In spite of this, some non-motorised boat owners said that there were no problems and that if there was a problem, they went elsewhere. However, the majority of disputes concern these boats.

The non-motorised boat crews say that the motorised boats ignore the signals placed at the end of their nets, as well as their hand signals. They claim that the motorised boats regularly drive their boats over their nets, causing considerable damage. The motorised boats complain that the non-motorised boats are a nuisance and that their net location signals are inadequate. The non-motorised boats are at a comparative disadvantage due to the lack of speed and slow manoeuvrability of their sail boats. Furthermore, non-motorised boats need to be able to identify the motorised boats and the damaged net, in order to make a complaint through the caste elders.

On the day that I went fishing in a non-motorised boat, the motorised boats came very close to us. They would direct their boats in our direction and only miss us

and our nets by a few feet. I found it intimidating. It must be frightening for the fishers, especially at night.

The following is an example of how the non-state legal system should work to resolve disputes between non-motorised and motorised boats. The example was given by a non-motorised boat owner:

> Today the fibre boat belonging to KR (Mulapeta) spread their jaco net into the sea. His net was damaged by an engine boat belonging to Uppada. The engine boat owner appointed and sent a fisherman to repair KR's jaco net. So the dispute was settled by mutual agreement. If the motorised boat owner disagreed to repair the net or KR did not agree with the engine boat owner's offer to repair it, then automatically the dispute would have arisen between them. Then the caste elders from Mulapeta and Uppada would settle it after hearing the problems of both parties. It may be payment of damages, or repairing the net by the wrong doer. Or each party may bear half share each of repairing or replacing the damaged net with a new net.

These examples are rare. The following case illustrates how social sanctions are carried out, which express the resentment that non-motor boat fishers feel towards motorised boat fishers:

> Today, at 9 a.m., on the bank Mulapeta Mogha where boats are parked, ten to fifteen Mulapeta fishermen of non-motorised boats were repairing their nets. Several motorised boats from different villages were also parked on the bank. One motorised boat fisherman from Konapapapeta unsuccessfully tried to push his boat into water. He called the other fishermen to help him; but no one moved. Finally, 4 or 5 non-motorised boat fishermen from Mulapeta went to help him; but the remaining did not go.
>
> The remaining fishermen were asked why they did not go to help him. One of them replied: 'Here, he asked for help; but in the marine fishing, he tries to beat us. Not only him but other engine boats like

this. Sometimes they cut our nets in the sea; but here he is wanting our help. Who will help him?'

Another man said that originally the engine fibre boat owner belonged to Mulapeta. Now, he is settled in Konapapapeta. 'He even does not greet us when we see him at sea. But here he is requesting help. He thinks he is better than us because he is owner of engine boat.'

A caste elder from Konapapapeta explained:

Generally boats spread their nets into sea and leave them for some time. Meanwhile other fishermen are spreading their nets in approximately the same area. Disputes arise because the fish may flow from one net into the second net. Ideally, they should divide the fish between the two boats.

Another problem is that some nets are visible, others are invisible. Another net may be laid in the same area because they do not see the other net. So the invisible net may be the cause of damage. In this case, the new comer gives compensation for repairing net; but fishing income is not shared. If the net is visible, the compensation for net repairs is paid by new comer and they both share the fish.

If boats belong to two separate villages, the dispute will be settled by both village elders amicably. He thought that the present procedure to settle disputes is sufficient.

Conflicts Between Motorised Boats

A motorised boat owner from Uppada explained that if two boats are fishing in the same territory, conflicts may arise. Usually, it is settled by dividing the fish income, either by the fishers involved or with the help of the caste elders. In either case, evidence is given by neighbouring boats at sea. If one boat has more rights than the other, the income is divided proportionately. For example, if the total income

from both boats is Rs. 10,000, the boat that was fishing first in the area will get Rs. 7,000 and the second boat will get Rs. 3,000.

The Uppada fisher explained that there are more disputes involving disco nets than other types of nets. The reason is that the *royya* (shrimp) are near the bottom and only available in a small area. Hence, everyone goes to that area. Sometimes, they fight each other with sticks and serious injuries occur. In these cases, the caste elders will adjudicate and decide who should receive how much compensation, usually based on the catch for that day.

When other nets are used, such as the *chanduva vala*, the boats should be separated by the length of their nets. However, if another fisher invades the territory of the boat who has first laid his net, there will be a dispute. The problem is that whenever a boat sees that another boat is having good fishing, other boats try to crowd into the area.

Conflicts Over River Fishing Territory

Marine fishers have always fished in the rivers when marine fishing was bad or on Thursdays. However, the primary rights of local Agnikula Kshatriya had been protected. Unlike the Agnikula Kshatriya in the mangroves, they never had *padus* or inherited rights in villages north of Kakinada. However, there was a system to auction use rights to sections of the river. During recent years, these rights are being infringed by the more numerous and powerful Vadabalijas in Mulapeta as a consequence of their decreasing incomes from marine fishing. The changing use patterns by both Agnikula Kshatriya and Vadabalijas of one of the rivers adjacent to Mulapeta illustrate: a) the demise of the exclusive territorial rights of Agnikula Kshatriya; and b) the introduction of a fishing technology which challenges notions of equity.

From the mogha to the Sheelamvanipalem bridge over the river (approximately one kilometre from the sea) has traditionally been open to all fishers. The fishing rights beyond the bridge were solely for the Agnikula Kshatriya who fish with cast nets from shore or from rafts in the river. Stake nets were also used.

Until about 1970, there was a slip (*aaseelu*) system for fishing beyond the bridge. The fishing rights to fishing upstream from the bridge to Sri Ramapuran were auctioned periodically. This 15 kilometre stretch of the river was divided into sections

for auction. The person who gained rights through the auction would charge a fee to fishermen who wanted to fish in his section. The fisher would be given a slip that said he was allowed to fish there.

Around 1986, the Mulapeta sarpanch (head of the Panchayat Raj and a Vadabalija) approached the authorities arguing that the slip system was unfair. As a consequence, the District Collector scraped the slip system. From 1986-94, Vadabalijas and Agnikula Kshatriya fished on the entire river from the mogha to Sri Ramapuran. In 1994, another conflict arose because the Vadabalija protested against the Agnikula Kshatriya fishing in the area between the bridge and the mogha. The caste elders from both communities met and decided that everyone could use both areas of the river.

During the ten years prior to research in 2004, the Vadabalija increasingly fished upstream. Around 1998, the Agnikula Kshatriya protested, claiming that most of the river area belongs to Ponnada Mandal, while Mulapeta is in the U.Kottapalli Mandal. In 2001, the issue could not be settled by the caste elders of Mulapeta (Vadabalija) and of Ramannapalem and Ponnada (Agnikula Kshatriya). Consequently, the District Collector again ruled that the river could be used by anybody.

Subsequently, the Vadabalija have started to use Kakinada navas and small shore seines (60-70 meters long) to fish 15 kilometres upstream to Sri Ramapuram where the fishing is better. They also claim that it is too expensive to use a range a nets and that the shore seine is the most effective. There are now eight Kakinada navas in Mulapeta who regularly fish in the river. Each has a crew of about 10 fishers. There is no *katnam*. All income is divided into shares: 1 share for the boat, one for the net, and each member gets one share.

The Agnikula Kshatriya fishers feel that the technology used by the Vadabalijas is ruining their fishing. Their caste elders have asked the Mulapeta caste elders to ask their fishers to use the small nets that they do. The Mulapeta caste elders have refused to cooperate and have told them to use shore seines as they do. This is beyond the financial means of the Agnikula Kshatriya. In response they have submitted a proposal to their village sarpanch (representing several villages) and the MLA; but nothing is done. Their leaders claim that they do not know to approach the Collector.

This case is another illustration of how the stronger group – numerically, politically and economically –is able to bully the weaker group in claiming fishing territories. Underlying this is the Agnikula Kshatriya dependence on the Vadabalija of Mulapeta. Many Agnikula Kshatriya work as crew or labourers on Vadabalija marine shore seines. And further, they often fish on the Mulapeta shores of both the sea and the rivers. Without the cooperation of the Vadabalija, their access to fishing would be circumscribed. In addition, the case illustrates the limitations of the non-state legal system to: 1) ensure equity; and 2) resolve disputes in a manner that does not entail appeals to the state legal system, in this case, the District collector, village sarpanch, and the MLA.

4.2 MECHANISED BOAT OWNERS' ASSOCIATION FISHERS

4.2.1 Who Is In Charge?

There are two boat owners' associations in Kakinada and one in Yanam, south of the research area[15]. These are registered, formal organizations. Their main function is to mediate disputes and to represent members to government. Their members are boat owners, not crew. Boat owners' associations represent all boat owners, not just those from the fishing castes. Of the two associations in Kakinada, the Swarnaandhra Mechanised Fishing Boat Owners Welfare Association is recognized by the Fisheries Department. A general meeting is held every six months. Every month there is a meeting with the officers. Their president claims that there are 530 members.

The Dolphin Boat Owners' Association broke away from SMFBOWA in 2003. When the previous president was not re-elected, he formed another organization. The Dolphin President claims that he has 300 members. These two organizations represent different political parties: Swarnaandhra supports Congress; Dolphin supports Telugu Desam. This division is symptomatic of their lack of political clout.

Elections are held every two years and are not conducted with a secret ballot. According to a former President from 1996-2001, only the Swarnaandhra Association is recognized by the government because it has the majority of members. Their elections are conducted by the Regional Director of Fisheries. The Dolphin Association elections are not organised by the Fisheries Department.

The officers, especially the presidents, are the key persons in these organizations. The presidents represent the association in dispute settlements among fishers within their sector. In addition, they represent boat owners in disputes with small-scale fishers, who are represented by their caste elders. Furthermore, they act on their members' behalf in negotiations with government agencies for such key issues as increasing the diesel subsidy.

Some of the boat owners do not seem to realise that there are now two associations. Nor are many artisanal caste elders aware that there are now two organizations; and consequently, they contact the president with whom they have had contact in the past. This strengthens the position of the break-away boat owners' association's president.

Strong criticism was heard about the presidents of both associations in Kakinada by their members. It was said that they are not impartial in settling disputes about repayment of private loans. Also they were accused of colluding (along with MPEDA officials) with exporters which results in fishers getting lower prices. There were criticisms that the presidents do not protect their members from paying the bribes that insurance companies demand before they will pay compensation. Furthermore, they claim that the dry fish traders bribe the presidents in order to be allowed to keep their fish on the harbour platform. According to one group of informants, the association presidents are behaving like feudal landlords. The well off boat owners and exporters encourage the presidents who will help them. Whether or not these accusations are correct, this perception by boat owners undermines the authority of the presidents. Symptomatically, the presidents argue that the state fishing regulations need to be enforced by the Fisheries Department.

4.2.2 What Are The Rules?

Net Mesh Size -- State Rule

The Government regulation is that nets must not use a mesh size of less than ½ inch. Before 1995, a ¼ inch net was used. One President of a Boat Owners Association told me that boat owners must comply with the mesh regulations. If anyone uses ¼ inch net, the boat owner is arrested by the boat owners' association for one week. Eight boat owners were arrested in 2003. They can tell by the size of

the fish if anyone is cheating on the net size. If they refer the case to the Fisheries Department, a fine of Rs. 2500, plus the catch can be imposed. Furthermore, the Fisheries Department can take a crucial part of the engine so that the boat cannot be used. He thought that the rules about mesh size were reasonable in order to protect shrimp for the future.

Fishing Zones -- State Rule

One President of a Boat Owners' Association explained the reasons for the eight kilometre limit in Andhra Pradesh. The difference is based on the comparative depths of the sea. Tamil Nadu has a five km limit because the sea is deeper. From Kakinada to Nellore, the sea depth is low because there are many tidal rivers. From Kakinada to Orissa, the sea is deeper because there are no rivers. He thinks that the eight kilometre rule is good because small boats are not able to fish in deep water. Small-scale fishers can maintain their families if fishing near shore is reserved for them. If mechanised boats fish in this area, it will affect *teppa* catches. Implicit in his statements are a notion of equity and moral justice.

The limited power of the boat owners' associations to enforce the state rule on fishing zones was made explicit, as was the view that it is the responsibility of the Fisheries Department to enforce the rule by one President of a Boat Owners' Association:

> THERE IS NOTHING I CAN DO TO MAKE MECHANISED BOATS COMPLY WITH THE 8 KILOMETRE RULE. It is the Duty of the Fisheries Department to enforce the rule. The Fisheries Department can punish. The Andhra Pradesh ports can control. Our association can give warning to mechanised boat owners. If they give more than two-three warnings, they report the boat owner to the Fisheries Department who can impose a Rs. 2500 fine and confiscate the catch.

On the other hand, he was aware of the limited powers of the Fisheries Department. There is one Fisheries Department boat that observes fishing for the entire Andhra Pradesh coast; and they have only three to four men to enforce the rules. He thought that the Fisheries Department Officers do not act properly. Some

are not even able to swim, which make them unsuitable for the job. And further, the Fisheries Department does not respond when boat owners make complaints.

The views of another Boat Owners' Association president concerning the fishing zones are different:

> Unfortunately, the eight kilometre rule is not good for mechanized boats at present. The government supports traditional fishermen, but not mechanized boat fishers. All kinds of boats catch fish together where ever fish are available. This is based on mutual consent among all fishers because we all belong to the fishermen community.

A sorra boat driver and former boat owner comments on the rule highlights the difficulties of poorly resourced mechanised boats to obey the rule:

> Because our small mechanised boats are not capable of deep fishing, all small mechanised boats concentrate on shore fishing. After negotiations with Fisheries Department, MLA, and District Collector, they are permitted *unofficially* [my italics] to fish in inshore waters because of intervention of MLA Bullabbai Reddy [Agnikula Kshatriya]. At present we have no problems for shore fishing. Now we can catch any where.

Analysis on fishing zones is not complete, but the preliminary analysis suggests different patterns of fishing between the sona boats and the smaller mechanised boats. Most of the sona boat owners interviewed (seven) report fishing outside 23 kilometre zone. However, most do not have GPS and reckon the distance from shore in terms of depth of sea reported in meters (but measured by *baralu*) and the time it takes to reach fishing grounds. Hence, their estimates are varied: for example, 40-50 meters, 3 hours = 32 km; 90 meters = 50 km; 120 meters, 5 hours = 35 km; 80 meters = 20 km. Most fishing is done between Vishakhapatnam in the north and Bandar to the south. Some reported fishing as far north as Orissa; but complain that they are fined by Orissa Government if they are caught. Those fishing near Chennai say that there are agreements with Tamil Nadu Government. Two boat

owners (out of seven interviewed) admitted fishing near shore in East Godavari District or in Kakinada Bay due to the expense of travelling farther out. Although most of the these boats are equipped to stay out for up to 15 days; most are fishing from one-five days due to increased costs of fuel.

The owners of six royya or pablo boats were interviewed. They all fish near shore in 12-25 baralu of water (8-16 meters). The majority fish for one day; two of the six fish for four-five days maximum. Most fish in the area off Uppada to Bhairapalem in the south.

Mechanised Boat Crew-Owner Relations – Non-state Rule

The economic rewards for the crew are declining both in terms of declining profits of fishing and in terms of the distribution of their share. The interviews were conducted with sona boat owners (seven) and crew (four). The boat owners only give repayable advances and many give no advances. This is a factor in why most (one informant said 90 per cent) crews and drivers are temporary. A few boat owners are able to give their crew beta (tips) when the profit is over Rs.3000; but this is declining. Several different share systems were reported for the 9-10 crew on each boat:

1 After costs, the profit is divided into two shares: one share for the crew and one share for the owner. The owner gets a proportion of crews' share if he works on the boat. The driver gets a share from crew's share and similar amount in cash from the owner.
2 After expenses are deducted, the profits are divided into 3 ½ shares: 2 ½ go to owner; 1 share for the crew. The driver gets a share of crew's share plus the same amount in cash from the owner. Every 15 days, the loss and profits are calculated for the entire period. If the expenditure is more than sales, this will be deducted from the crew's share the next time they are paid. This system is linked with advances given by mediator (middleman) for shrimp.
3 Today, some boat owners give 10-12 per cent of total catch profit to the crew and the driver as an alternative to system described above. The driver gets an extra ½ share. A *beta* (tip) of Rs. 40-50 per day are given to

> the driver; Rs. 20 per day for the crew. If there is good fishing, the crew gets Rs.200-300 per day; if there is poor fishing, the crew gets Rs. 80-100 pd. Many owners have stopped giving the tip or curry fish when the catch is more than expenses.

The targeted fish is primarily shrimp. Because the owner sells the shrimp and high value fish, the crew and driver do not know the amount of the catch or the price received.

In addition, the by-catch is left on the deck to be sold for dry fish. This is divided into 3 shares: two for the driver and crew; 1 for the owner if there is good fishing. If there is bad fishing, the dry fish is divided into two shares: one for driver and crew; one for the owner.

The interviews with smaller mechanised boat owners and crew has not been analysed but given their financial difficulties, it can be assumed that these relations are strained. They all had a crew of eight. The system of crew payment is the same as that for the larger mechanized boats. Their target catch is primarily sinku royya. The going rate for sinku royya is Rs. 35 per kg. Their catches vary from 10-70 kg.

Fishing Ban, 15 April- 31 May -- State Rule

There appears to be compliance with the fishing ban. 'We can stop mechanized boats during the ban period because they must sell their catch in the harbour only' (President of one Boat Owners' Association). A royya boat owner said that the boat owners' association will take action on behalf of port authorities, if the ban is broken. A pablo boat owner said that they comply with the ban because of enforcement by both the boat owners' association and the Fisheries Department:

> If anybody goes fishing, the boat owners' association can confiscate catch. Furthermore, they cannot get diesel during the ban. The Fisheries Department will register a case and impose a fine. 100 per cent of mechanized boat owners' associations do not go for fishing in ban period.

Many in the mechanized sector expressed resentment that the small-scale sector continues to fish. One boat owner complained that if an artisanal boat is captured by the Fisheries Department, the Fisheries Department officers are sympathetic that they need to feed their families and does nothing. One Boat Owners' Association's President said that he thought it was unfair that the ban no longer applies to non-mechanised sector. He stressed that there is a need to have financial support for fishermen during ban period.

4.3 INTER-GROUP DISPUTES

The first level of dispute management is between the disputants, usually at sea. At a second level of dispute management, the caste elders (representing small-scale fishers) and the boat owners' association presidents (representing the mechanised boat owners) act as mediators. One mechanised boat owner said that disputes between mechanised boats and small-scale boats occur because of accidents. He thought that it is fair that a mechanised boat owner should pay compensation when the small-scale fishing gear is damaged by a mechanised boat. One better resourced mechanised boat owner was outraged to think that someone would throw a net into the shore seine; and he thought they should be penalized by paying 10 times the value of this fish to the shore seine owner. Most of the disputes are between smaller, poorly resourced mechanised boats and small-scale sector fishers.

4.3.1 Small Mechanised Boats and Small-scale Boats

The problem

The problem of competition over fishing territory close to shore (i.e. less than 3 km.) has been evident since the introduction of mechanised boats. A report by the Technical cell of Andhra University published in 1978 summarises the issues:

> It is also observed that there are several 'skirmishes' and 'clashes' between the traditional fishermen, and the mechanized boats

> operators. This resulted in the loss of life and property. During the course of our investigations the traditional fishermen pleaded for the total elimination of the use of mechanized boats within certain distance from the shore. Their main argument is that the fishing nets used by them are damaged by the mechanized boats and there is no method of compensating to the fishermen for the loss of their equipment. Therefore, the replacement of their nets involves huge expenditures which resulted in an increase in their debt burden. It is also ascertained that their fish catch is being reduced as the fish tends to move away due to the noise created by the mechanized boats. Therefore, the fishermen strongly argue for the demarcation of the fishing zones for the operation of the mechanized and traditional craft. (Subrahmanyam and Sivayya 1978: 128).

In 1980, a government order was passed to prohibit trawlers (mechanised boats) from fishing near shore. According to a caste elder in Konapapapeta, this was in response to a petition of caste elders from Addarapeta and Suryapeta to MPs and MLAs from the area to Chief Minister. There was no implementation of the government order. Fishing zones were not established until the Fisheries Regulation Act of 1995, which is also not implemented.

On any good fishing day, hundreds of smaller mechanised boats can be seen fishing close to shore, often within the same territory where shore seines have been laid. During the night, the problem is even greater. Given the density of boats, even during the low season when fieldwork was done, it is inevitable that there will be conflicts. Although most of the mechanised fishers think that the fishing zones are reasonable, many of the smaller mechanised boats cannot afford the diesel or the boat repairs that would enable them to fish beyond the 8 kilometre zone. Furthermore, the Fisheries Department does not have the resources to enforce the restrictions. As a consequence, the only means of resolving disputes is between the disputants themselves or through fishermen's organisations.

Ideally if a net is damaged, the boat that has caused the damage will repay the owner the cost of the repairing the net and/or the fish will be distributed between them. If they do not settle the dispute, the aggrieved fisher can note the registration number of the mechanised boat and report the case to the boat owners' association,

usually with the aid of one of the caste elders from his village. In theory the wrong doer will pay compensation in either money or net, the choice is that of the aggrieved. Sometimes the mechanised boat owner does not agree to pay actual damages. So, sometimes, the boat owner may lose Rs. 2000-3000. The entire procedure depends on the fishers' ability to recognise the boat registration number. This is often difficult, if not impossible to do, especially as many small-scale fishers cannot read. Furthermore, the mechanised boat owners often deny that their boat was involved. The small-scale fishers are in a comparatively weak position which underscores acts of violence between the two groups. In the following section, the perspectives of mechanised and small-scale fishers will be presented, followed by a few examples of dispute resolution.

The Perspective of the Mechanised Boat Crews and Owners

Mechanised boat crews complain that they do not see the nets of small-scale boats, particularly at night, because the nets are not properly marked and there are no lights on the small-scale boats. Consequently, mechanised boats damage the nets of small scale fishers. Rarely are the mechanised boats or nets damaged. A sorra boat driver explained how disputes are settled:

> Generally we settle all disputes on sea. Some disputes with alivis [shore seines] are settled in boat owners' association's offices. The boat owner will pay damages for the other boat owners' nets; but not for drivers and crew of the damaged boat. If it is a minor incident, we offer some fish as a remedy. If not, we repair their nets on our boats. If there is any major repair, then we handover the net to net makers for repairs and we will pay the net maker. 90 per cent of disputes are settled by ourselves on the sea.

Those disputes that are not settled at sea are adjudicated by the boat owners' associations' presidents. Both boat owners' associations presidents told me that they adjudicate on disputes between their boat owners and small-scale fishers, represented by the caste elders whom they have good relations. Payment of compensation to one or two small-scale boats is arranged daily. Compensation is for

nets only, not loss of fish. If this represents 10% of dispute settlements, the magnitude of the conflicts over space can be imaged.

However, the aggrieved fishers must have the boat's registration number. Every mechanised boat should have an identification name, colours and registration number. However, the boat owners' associations' presidents admit that some boats do not renew their registration.

Both boat owners' associations' presidents acknowledge that they have limited powers to control their fishermen. One President thinks that the Fisheries Department should establish a project like those for forest conservation, which is being proposed by Commissioner. The Fisheries Department would appoint persons to act as guards along the coastal area. They would control illegal catching by seed collectors, enforce the eight km zone and mesh size regulations of the government. Those who are caught should hand over their catch to the government and pay a fine. 20 per cent of the value of the catch could be used for village development and the rest would be for the Fisheries Department.

Many mechanised boat owners and crew complained that the small-scale fishers are not complying with the state fishing regulations pertaining to: the mesh size of their nets, the use of seed nets, and the six-week fishing ban. Furthermore, they complained that the small-scale fishers hunt one kind of fish during each season (e.g. konnam, and jella and shark with hook and line), especially during the ban time.

The Perspective of the Small-scale Fishers

From the perspective of small-scale fishers, the mechanised fishing is the greatest threat to their livelihoods because mechanised fishing practices are depleting fish stocks and mechanised boats frequently damage their nets. They argue that the non-state legal system is not sufficient to protect their exclusive sea tenure rights to fish in inshore waters, nor is it sufficient to address compensation for the destruction of their nets.

When a mechanised boat cuts the small-scale fishers' nets, some of the mechanised boats try to settle the dispute at sea, particularly if they are surrounded by small-scale fishing boats. Most often, small-scale fishers are impotent to receive compensation. They claim that in the majority of incidents they cannot identify the boat because they are illiterate. Often the mechanised crew give the wrong name of

the owner and the wrong registration number. More often, the mechanised boat leaves the scene before his boat can be identified. When they do identify the mechanised boat, and take the case with their caste elder to the boat owners' association, they rarely get compensation; and when they do get compensation, it does not cover the damage. One motorised boat owner from Konapapapeta said that his nets had been cut four times and that he has never received compensation. The frequency of incidents appears to be several a day. As cited above, one mechanised boat owners' association president said that he had to deal with several disputes a day. This represents a very small proportion of the actual incidents of 'accidents' at sea cause by conflicts over space. And the caste elders in several villages reported that they had to represent their small-scale fishers four or five times a month.

Furthermore, small-scale fishers claim that the mechanised boat crews are violent and armed with knives and sticks. In spite of their fear, occasionally, the mechanised boat fishermen are brought to shore and the caste elders give them a fine. There have even been a few occasions when the small-scale fishers have dragged the mechanised boat to the shore or have stolen parts of the engine.

Mechanised boat fishing is seen as inequitable. Small-scale fishers complain that they have cell phones to tell each other where good fishing is. Consequently, they get more and more good fishing. If there is good fishing near shore, they come here. As proof that the mechanised boats are the cause of their decreasing fishing stocks I was often told that the small-scale fishers get very good fishing during the six-week ban. The view was often expressed that if the government would implement the boundary regulation, they would catch sufficient fish and their nets would not be damaged.

The perspective of the small-scale fishers is summed up by one caste elder:

> There is no limit for trawlers in Andhra Pradesh; they do what they like. Trawlers are taking food from our mouths. Sometimes, the trawlers put their nets within in the *alivi* [shore seine]. Sometimes they slap us and we slap them. The main issue is power. If it [fishing in inshore waters] continues we will lose our livelihood.

A Case to Illustrate the Inadequacy of the Non-State Legal System

On Friday night, 3 December, 2004, the jaco net of a non-motorised boat (*teppa*) owned by VR was ensnarled in mechanised boat's gear. It was at night, about 3 am. There was no light on the *teppa*. And the mechanised boat did not realise that the *teppa* and its net was being towed by the mechanised boat for about two kilometres until the mechanised boat turned on its lights.

The mechanised boat crew gave VR their boat number, the name of the owner, and the owner's telephone number in Kakinada. It was agreed to meet in Kakinada fishing harbour the next day.

The total jaco net was 720 baralu; 240 baralu were damaged. The value of the damaged portion of the net was Rs. 6000. So VR hoped that compensation would be Rs. 3000.

On Sunday afternoon, the Sarpanch and a caste elder went with the *teppa* owner to the harbour. Their plan was that after contacting boat driver, depending on his attitude, they would go to an ex-MLA (an Agnikula Kshatriya), who could put more pressure on boat owners' association to get compensation.

The boat did not turn up. However, the auctioneer who deals with the boat thought it would be in on Monday morning. The Sarpanch did not seem to have any contacts in harbour. Hence, the research assistant, Shiva, acted as middleman. Shiva found out that the registration number is not from Kakinada. Those asked thought it was from Visakhapatnam. Obviously, the mechanised boat crew had deliberately given VR the wrong registration number. Everyone in the harbour was very helpful which I found surprising since we were seeking compensation from their customers.

On Monday, VR returned to the fishing harbour where the boat did not dock. However, VR got the correct number from government harbour workers on Monday.

On Tuesday, VR met the Sarpanch who said that he was not interested in coming to harbour due to his personal work. He suggested that VR should meet an ex- MLA along with madam (the researcher). Then VR secretly met the former Sarpanch and current head of the caste elders who wrote a letter to the former President of Swarnaanadhra Boat Owners' Association. [He did not realise that he has not been president for the past 2 years or that he was now president of the Dolphin Boat Owners' Association].

Afterwards, VR went again to the current Sarpanch, not mentioning the letter from the former Sarpanch. The Sarpanch suggested that VR should first go to harbour and check that the boat was there, and that he should wait for him and Shiva at the harbour main gate. When they arrived, VR was neither at the gate nor at the harbour. Later that afternoon, Shiva returned to harbour, where he met VR. He had met with the President of Dolphin Boat Owners' Association who read the letter from the former Sarpanch. The President told him that our clerks have gone to Kerala for Ayyappa Swamy Pilgrimage, so he could not help VR that day. He said that the next day he could find out and inform him.

Later, VR was searching all the boats at the harbour, but he could not find the boat that had destroyed his net. One person told him that the boat he was looking for was moored in Yetimoga area and that if he could give him Rs. 500 he would show him the boat. VR did not have the money. So he returned to Mulapeta.

A week after the incident, VR said that he did not get any compensation from the mechanised boat. He found out that the boat belongs to Visakhapatnam; but the fishermen reside in Kakinada. VR did not meet the ex-MLA. Instead, he gave a complaint to one of the boat owners' associations at Kakinada. The fishermen of Kakinada promised to inform VR if the mechanised boat came to Kakinada.

The damage to the net was Rs. 6000. He spent Rs. 600 on travelling expenses to Kakinada, where he spent three days. He spent two days buying a second hand net which he bought for Rs. 3000 in Uppada by taking a loan from a money lender. Then he spent another four days repairing the net. As a consequence of the damage to his net, he had lost five days of fishing.

He would have lost more days fishing if he did not go fishing with old nets in the evening, after spending his mornings making and repairing the replacement net. The case clearly illustrates the financial risks involved in trying to get compensation.

Three weeks after the incident, VR had not had any contact with the boat owner or the boat owners' association. This case illustrates how ineffective the non-state legal system is in resolving this type of dispute. It is not unique. The Mulapeta Sarpanch said that there were about 2-3 disputes between *teppas* and mechanised boats each month in which the *teppa* got the registration number. A far greater number of incidents occur in which there is no registration number. In only 7 or 8 of these cases during the past year did the teppa owners get compensation.

What amazes me is the amount of time required to negotiate these disputes. Both a caste elder and the Sarpanch spent several days on this one case. And further, the *teppa* owner only compensates them for the fare to the harbour. Therefore, in order to maintain a position of leadership, one must have relatively secure economic resources.

4.3.2 Small Mechanized Boats and Shore Seines

The Problems

The problems arise because large numbers of under-resourced mechanised boats are fishing close to shore. They regularly travel over the shore seine. Although most mechanised boats try to avoid tearing the shore seine by submerging the shore seine deeper into the water, damage does occur. In these cases, the shore seine crew is usually helpless to do anything: if they are all on shore, they will not be able to reach the boat or to read the registration number; and if the nava is still laying the net, the mechanised boat can travel faster than they can row. Another major problem is that the mechanised boats throw their 'test' nets within the shore seine, taking the fish out of the shore seine. A third problem is that mechanised boats are sometimes deliberately sunk near the shore so that the owners can claim insurance, thus ruining a shore seine *padu* site with submerged debris. The frustration that the shore seine crews feel can be imagined; and it is not surprising that they capture or damage mechanised boats whenever they can.

The case of the mechanised boat being towed to shore and their owner being fined by the caste elders has been described. Another case involves the theft of equipment from a mechanised boat.

> On 23 October, 2004, a mechanised boat was moored in the shore seine area. At night, only three crew of the boat were there. Some unknown persons threaten them with sticks, etc and took away some equipment from the boat. The following morning, the village crier went through the streets of Mulapeta announcing: 'If anybody has taken equipment from the boat, silently bring it to the Rama Temple.

Otherwise, the case will be filed and the police will search each and every house.'

The mechanised boat fishermen were Agnikula Kshatriya. They complained about the theft to the Sarpanch of Mulapeta. The Sarpanch directed the crier to make the announcement. The equipment was not recovered and no more was heard about it.

The case illustrates how the mechanised boat owners use the threat of civil law to resolve disputes. In contrast the caste elders discourage involvement with the civil law. It also illustrates how fishers are divided not just by mode of fishing but also by caste identity.

Most of the mechanised boat owners and crew think that it is wrong for mechanised boats to fish in inshore waters. They justify their actions by their economic hardship. The President of one Boat Owners' Association admitted that some small mechanised boat owners are stealing fish from within the shore seine net. In doing so, they are not adhering to the 8 km fishing zone; but the shore seines are not complying with the Act by using mesh that is smaller than ½ inch. According to him, a gentlemen's agreement was made between the mechanised boat owners' associations and the shore seine owners in 1999. They would not complain to Fisheries Department about small mesh used by shore seines, if the shore seine owners would not complain about mechanised boats fishing within 8 kilometre zone. [There is no other evidence].

4.4 CONCLUSIONS

These two non-state legal systems – that of the small-scale fishers and that of the mechanised boat fishers – have evolved to meet the interests of the different stakeholders. The small-scale legal system is primarily grounded in the identity and traditional fishing practices of small-scale fishers. Consequently, it has developed in the context of the traditional fishing villages and the historically based authority of caste elders in managing economic and social relations in their villages. The management of fishing practices is one domain in which they are involved. The capacity of the caste elders to manage fishing practices is embedded in the social,

economic, political and religious institutions of fisher villages. This is both its strength and its weakness. In inter-village disputes, the range of their authority to enforce adjudicated decisions is weaker.

The small-scale fisher's legal system can be characterised by the primary attention given to issues of resource distribution. This in part is due to the nature of its village-level domain. Implicitly, it is also concerned with issues of resource health. The Thursday ban on fishing, for example, limits the days of fishing, as do numerous religious festival days. However, the logic behind these fishing-free days is not conservation of resources, but rather symbolically to reinforce caste identity and the power of the village elders. Donations to the Village Fund from fishing on 'fishing-free days' (i.e. Thursdays) and contributions by gear owners provide the cash to hold annual religious festivals which also reinforce caste identity within the village. However, these village funds are also used for welfare activities. Given that the Village Fund is controlled by the caste elders reinforces further their power base within their village, and subsequently their authority to enforce the non-state legal system of small-scale fishers.

In contrast, the non-state legal system concerned with the management of mechanised boats is not embedded in village-based relations. All of the mechanised boat owners and crews have migrated to Yetimoga or Bhairavapalem in relatively recent years. Customary rules concerning boat fishing at sea and the procedures for adjudication are acknowledged. However, their core rules are those of the state legal system. The organisational structure of this non-state legal system is elected bodies – the mechanized boat owners' associations – whose primary function is to represent the interests of the boat owners. Disputes with small-scale fishers centre on issues of resource distribution. Given the weak economic position of their smaller mechanized boat owner members, it is hard for this non-state legal system to uphold the territorial boundaries. However, in contrast to the small-scale fishers' legal system, it is more effective in upholding rules concerned with resource health, such as the six week fishing ban and mesh regulations.

For the most part, both the state and the non-state rules are perceived as reasonable and just by most fishers. The non-state legal systems have largely incorporated the rules of the state legal system. However, the state legal system is dependent on the non-state legal system to enforce the state's rules. At the same time, it is clear from this chapter that the non-state legal systems have limited powers

to enforce these rules. And further, it is clear that fishers in different sectors resent that the rules are not being upheld by all the fishers. This symbolizes the centrality of the principle of equity. The authorities of both non-state legal systems openly acknowledge their limited capacity to enforce the rules. And hence fishers' leaders in both sectors repeatedly expressed their view that the rules need greater enforcement by the state.

CHAPTER FIVE: STATE LEGAL SYSTEM

In Chapter Two, a large number of stakeholders were identified whose interests affect the resource health and resource distribution of fisheries. This chapter will focus on those state bodies and laws which should protect resource health and/or resource distribution. The key body is the Fisheries Department one of whose functions is to enforce the Fishing Regulation Rules Act, 1995. The Pollution Control Board should protect fisheries from industrial pollution and is supported by legislation. The third key actor is SADA (Shore Area Development Authority) whose work is guided by the Coastal Zone Regulation Act. In addition, civil law is involved through the Police Courts and the District Collector when they are called to adjudicate in disputes among fishers when their own legal systems fail.

It is not the intention of this report to criticize the state legal system. Most of the officers, who generously gave me their time and much practical help, expressed grave concern about resource health and the plight of fisher communities, as well as great frustration that they were powerless to do more. However, most bodies are weak in enforcing the legislation designed to protect resource health, and the implications of this is deleterious to resource distribution.

5.1 FISHERIES DEPARTMENT

The Fishing Regulations Rules Act, 1995, was described in Chapter Three as a response to core fishing problems. In Chapter Four, it was described to what extent these regulations have been incorporated into the non-state legal system. Evidence was given in Chapter Four to show that where the non-state legal system breaks down, fishers from all modes of fishing desire stronger implementation of the rules, especially the state rules concerning fishing zones, mesh size of nets, and the seasonal fishing ban.

The Act clearly states in great detail what the powers and procedures of the Fisheries Department are to enforce the rules. Unfortunately, the Fisheries Department, according to their officers, does not have sufficient power to enforce

them. It is indicative of this that during 2003, only eight cases were made for net mesh size violations and two cases for fishing during the ban, for the entire Kakinada Division of the Fisheries Department. In fact, the only enforcement that was heard concerned repayment of loans for fishing boats. In this regard, several fishermen from Uppada complained that parts of their engines had been taken due to default in loan repayments.

Why is the Fisheries Department not able to enforce its legislation? The reason lies in the low appreciation given to the contribution made by fisheries to the Indian economy. This is symbolised by the fact that fisheries does not have its own ministry. In the Government of India, fisheries is under the Agriculture Ministry's subdivision of Dairy Development. Fisheries exports are under the Ministry of Commerce. Regulatory functions are under the Ministry of Agriculture. And ancillary functions are under the Food Processing Ministry.

The situation is worse in the Government of Andhra Pradesh. Similarly, the fisheries secretariat is under Dairy Development which is under Animal Husbandry. However, the new government of 2004 decided that the number of ministries in each state must be reduced. As a consequence, the former Fisheries Department has been merged with the former Ministry of Minority Development.

According to one senior fisheries' official, regulations to limit the areas of fishing – that is, the fishing zones—are hardly implemented due to the lack of manpower which results in lack of supervision and regulation. 'In effect, there is no legislation because the Act is not implemented'. The Government of India sanctioned two crafts to Andhra Pradesh to supervise fishing along a coast line of almost 1000 kilometres. These two crafts cost Rs. 1 crore. The State of Andhra Pradesh could not provide the recurrent costs to run these boats which was Rs. 30 lakhs per year. Consequently, they cannot use the boats.

Nor did he think that the Coast Guard had a potentially useful role in enforcing the fishing zones. In his view, the Coast Guard has a different role from the Fisheries Department. Their role is security.

Similarly, there are few resources to implement mesh size regulations or the ban. Officers are pro-active in trying to stop the use of the seed net; and nets have been confiscated in some villages. Little action appears to be taken concerning the ½ inch mesh restriction. On the other hand, regulation mesh size was used on most motorised boats and mechanised boats observed.

There is also a problem of enforcing the ban on fishing for 45 days. Some officials reported being assaulted when they tried to enforce the ban.

With regard to these last two regulations concerning nets and the ban, the attitude of the fisheries' officials goes against the over-arching principle of equity that is fundamental to the logic of both non-state legal systems. The Fisheries Department officials interviewed did not think that it is important for the traditional fishers (that is, the small-scale fishers) to comply with either of these rules. For several years, the GOI has made an annual executive order excluding traditional fishers from the ban. In 2004, the Government of Andhra Pradesh also adopted the exclusion of traditional fishers from the seasonal ban. 'This is because the artisanal fisher's catch is insignificant compared to the mechanized sector. The traditional fishers fish within the limits of natural recuperation of stocks'. Repeatedly it was said that the damage caused by the shore seine (using 8mm mesh) was considered to be not significant to resource health. The bias of fisheries officers that the small-scale sector should be protected from the mechanised sector was summed up by one senior officer:

> The traditional rights of fishermen must be left to them. They should not be touched by trawlers, etc. Any action by commercial fishers should not have an adverse affect on effect on fishermen in the artisanal sector.

With regard to the rules in the Act concerning penalties for mechanised boats damaging the boats and nets of non-mechanised boats, nothing was ever mentioned about this. One can only assume that given the aggravation caused by mechanised boats damaging non-mechanised boats and that this is the major arena for disputes between the two non-state legal systems, that the state legal system is unable to redress this issue either.

Not only is the Fisheries Department unable to enforce fisheries regulations. Great frustration was expressed by many officers that they have little influence with other organisations that should be protecting the resource health of fisheries. For example, the Pollution Control Board was said to take no action after the Fisheries Department notified them of violations. And further, there is no regulation of shrimp hatcheries.

Most Fisheries Officers thought that the Fisheries Department was primarily a welfare and information organisation. In Chapter Three, a number of welfare-oriented programmes were described. With regard to disseminating information, the Fisheries Department appears to have good contact with fishers in villages.

The Fisheries Department officials are in regular contact with artisanal fishers both in the villages and in their offices in the locality. They do seem to be sympathetic to the artisanal fishers and to listen to their problems. The situation for the mechanized sector is not known. Certainly, many of the rules in the state legal system reflect the concerns of artisanal fishers. However, the state legal system rules are not discussed with the fishers. Rather, the Fisheries Department officers come to the villages to tell the fishermen about the rules.

Many artisanal fishers feel that the officers do nothing for them. Given their limited resources, this is unfair criticism. In Mulapeta, for example, there are regular village meetings with Fisheries Department officials to inform villagers about new rules, benefit schemes, etc. The fishermen say that they attend the meetings which are announced and held publicly. The Assistant Director of Fisheries comes to the village to explain new projects once or twice a year. Decisions about who has been chosen to benefit from the project and the criteria used in selection are also announced publicly. Therefore, there is transparency about new programmes.

Some fishermen said that they go to the local Fisheries Department office in Uppada several times a month. A Fisheries Department officer from the Uppada Branch Office comes to Mulapeta once or twice a week to the Sarpanch to find out problems. And an officer should come to village daily to collect data on fish catches. The FD does succeed in educating fishermen because the fishermen are aware of the reasons for resource decline such as pollution, and the dangers of seed nets. However, the fishermen show tremendous ignorance about the rules of the Fisheries Regulations Act.

In contrast to Mulapeta, in a neighbouring village inhabited by Agnikula Kshatriya fishers, they complained that the Fisheries Department was never involved with them. According to their caste elders, the Fisheries Department officials never came to discuss their problems.

It was the generally held view of Fisheries Department officers that the fishing ban, fish net mesh size, and fishing zones could not be enforced without the cooperation of all stakeholders. Consequently, senior Fisheries Department officers

thought that community based fisheries management held promise, since the government could not enforce the fishing regulations.

The Commissioner for Fisheries in 2004, Dr. P. Krishnaiah, was actively promoting a proposal for the development of community based fisheries management (Krishnaiah, 2004). His proposals mirror those for community based forest management. The idea that everyone has a stake in fishing would be encouraged in fishing communities where village based, elected committees would be established. The committees would include women and the power to enforce the rules (i.e. the rules of the state). It was envisaged that these committees can co-exist with the traditional sector management.

> It is proposed to identify the setback/drawbacks in the present system through system based approach and introduce voluntary organizations at field level by sensitizing community and stakeholders with the formation of Matsya Parirakshana Samithis (MPS) in coastal villages in a phased manner in the lines the Vana samaraksha samithis which were working for the community forest management in forest fringe areas. As the enforcement of rules and acts are no longer effective in ensuring the sustainable coastal zone management with limited government machinery and funds, the proposed MPS will be empowered to gear up the activities against the threats and damages which are detrimental to the environment as well as to the coastal life. The MPS will also report the matters of urgency to the concerned agencies, which have hitherto been brought to the notice only after the damages are caused. Besides the MPS will render liaison service to the needy people in assessment of impact of the industries and assist in processing of the cases on chargeable base (Krishnaiah 2004: 4-5).

It is envisaged that the MPS will be authorized to levy fines, part of which can be used in a village development fund. The new proposals for Community Based Management of fisheries could involve a wider range of village level interest groups. In this way, the corruption of elders could be avoided. However, the experience of Community Based Management in forestry has been shown to strengthen the power of elites (J.P. Platteau and A. Abraham, 2002). This would be a particular danger of

these proposals since the fines would go into the village fund which is controlled by the elders. More critically, it is not clear how mechanised boat fishers will be involved. Nor is it clear how artisanal fishers can enforce compliance with zonal infringements given that it is beyond the resources of the Fisheries Department.

5.2 POLLUTION CONTOL BOARD

Protection of resource health is the main function of the Pollution Control Board. It has the legal powers and the human resources to enforce the rules. In Chapter Three, the views of fishers and Fisheries Department officers were that the PCB is not as effective as it should be in combating current polluters. Furthermore, fear that they would permit additional polluters, especially with regard to industrial development, was widely expressed in language similar to the following statements: 'Corruption in PCB leads to ignoring the pollution norms, in spite of increasing rules of control'. 'It is not possible for the PCB to withstand political pressure'.

5.3 SHORE AREA DEVELOPMENT AUTHORITY

The **Coastal Regulation Zone Act** aims to protect coastal areas of seas and estuaries from activities that would have adverse affects on the environment.

> During the early part of the present decade, India notified "coastal stretches of seas, bays, estuaries, creeks, rives and backwaters which are influenced by tidal action (in the landward side) up to 500 meters from the HTL and the land between the LTL and the HTL as the Coastal Regulation Zone (CRZ)".[sic.] Further, activities such as industries, disposal of hazardous substances, fish processing, effluent discharge, land filling, land reclamation, mining, harvesting ground water, construction and landscape alteration are banned within CRZ with a few exclusive exceptions. Important national activities within CRZ requiring waterfront, such as port and harbours, defence

requirements and thermal plants are regulated and cleared after critically evaluation the proposal….

For regulating coastal zone activities, coastal stretches within 500 meters of high tide line on the landward side are classified into four categories.

CRZ-I covers areas that are ecologically sensitive and important as well as the zone between low and high tides. No new construction shall be permitted here except for extremely critical necessity.

CZR-II covers areas that have already been well developed with all infrastructure like roads, sewerage lines, water supply pipes etc. lad out, such as within urban and municipal limits. No new constructions on the seaward side of the road can come up here and reconstruction of existing structures will be restricted.

CZR-III covers areas that are relatively undisturbed and not falling under the above two zones. Here, up to 200 meters is no development zone, 200 and 500 meters can be used for hotels and beach resorts temporarily under permission while traditional rights of fisherman to build small structures are honoured.

CRZ- IV covers areas in islands except those designated in CRZI, II, and III. Here, no building can come up within 200 meters and after that more than two floors are not allowed. Besides, use of corals and sands, dredging and underwater blasting are also banned. (Ramasubramanian et. al. n.d.: 1)

The Act was not enforced with regard to hatchery development in East Godavari District. There was a famous Supreme Court Judgement (S. Jagannath v. Union of India, 1996) against the hatcheries which has not been implemented. With regard to maintaining marine resource health and resource distribution, the lack of compliance by the hatcheries has had a detrimental effect for the livelihoods of small-

scale fishers. The inlet and outlet water pipes for the hatcheries are laid through the shore into the water. They should be buried, and mostly are, but they, nevertheless, obstruct fishing activities, especially the pipes in the water. Furthermore, the fishers perceive that their activities are causing pollution. The greatest concern, of course, lays in the future development of industries. Throughout 2006, there have been protests by fishermen in Visakhapatnan with a new steel works whose building robs them of their shore based activities. In East Godavari, land has been sold to industrial interests in those mandals where most of the fishing villages of this study are based.

However, there is another twist to the CZR that affects fishers. Namely, most fishers prefer to live near the shore. Strict implementation of the Act will impede their fishing activities. Unlike fishers in several other states, in Andhra Pradesh, fishers have no legal rights to the shore.

One government scientist said that the CZR is too rigid. He thought that the regulations should be reasonable. The approach to CZR is wrong, in his view. The scientist thought that planners must think of the upper reaches of the coastal zone and its affect on coastal zone. For example, industries in Rajumandry affect aqua culture and estuary fishers, which in turn affect coastal fisheries. A holistic approach is needed in his opinion.

5.4 POLICE

In Chapter Four, it was explained that fishers use the state's civil law as a fall-back if non-state mechanisms fail in dispute settlement. The caste elders discourage fishermen from taking their complaints to the police. Furthermore, the police themselves usually refer these cases back to the non-state legal authorities. Nevertheless, the police are an important aspect of the state legal system which has an impact on fisheries management.

5.5 DISTRICT COLLECTOR

The District Collector is the senior administrative officer. This also entails adjudicating in cases at all levels. In Chapter Four, an example was given of fishermen bringing a dispute to the District Collector. And according to Fishing Department officers, the District Collector resolves all problems, not resolved at ministerial level.

In this chapter, the role of a number of bodies concerned with marine resource health and distribution have been described. Although the Fisheries Department is the main actor representing the state legal system with regard to fisheries, the roles of other bodies that represent a wider range of stakeholders are also important for understanding the operation of the state legal system. The interaction between these bodies highlights the lack of coherence and hence the limited effectiveness of the state legal system to protect marine resource health and resource distribution.

CHAPTER SIX: CONCLUSIONS

6.1 INTERACTIONS BETWEEN LEGAL SYSTEMS

6.1.1 Non-state Legal System of Small-scale Fishers

The Non-state legal system of small-scale fishers, based on the traditional legal system of caste elders, is the most effective legal system. Although sanctions are less strong than in past, they remain comparatively effective. The basis of this legal system is shared community-based ideas of what is reasonable (Gluckman 1955) and equitable.

The primary role of the caste elders is to establish rules which will facilitate fishing activities. When there are conflicts, they mediate in disputes. To the extent that the caste elder's decisions uphold the principles of reasonableness and equity, their authority is respected; and normally, there is compliance with their decisions.

These two roles link the village-based legal system with other villages to form tiers within this non-state legal system. In addition, it links the non-state legal system of small-scale fishers with the non-state legal system of mechanised boat fishers.

The reach of the law is strongest at the village level. In disputes over breaking fishing rules, there is some evidence from Mulapeta of bias towards those fishers who are more economically and politically powerful. For example, if a shore seine goes into another's territory, there is a tendency for caste elders to rule in favour of the more powerful *sarangi* (shore seine owners). This probably is due to the fact that the caste elders tend to be the most economically secure shore seine owners. In other villages, the caste elders have moved into non-fishing activities and this bias may not exist there. The reach of the law of the non-state legal system of small-scale fishers is less strong with regard to inter-village disputes. It is an admission that a local dispute cannot be addressed that the caste elders from other villages are called in to adjudicate. On the other hand, when boat fishers from Uppada and Konapapapeta ignored the fishing ban, strong sanctions were able to be taken to confiscate their catches because of the unity of the caste elders from different villages.

With regard to conflicts involving fishers from different villages using different technologies, inter-village dispute adjudication is less successful. For example, when

it is agreed that motorised boats should fish beyond the zone for non-motorised boats and shore seines, the motorised boats do not comply with the agreements they have made. And further, there are few sanctions that the caste elders can impose in these cases. Naturally, it is difficult for the caste elders from the village with motorised boat fishers to impose sanctions. To do so would be seen as unreasonable and it would be perceived as not supporting their own fishers.

6.1.2 Non-state Legal System of Boat Owners' Associations

The non-state legal system of the boat owners' associations has quite different foundations from that of the small-scale fishers. It has developed from the introduction of a new technology – mechanised boats. The association represents the interests of boat owners and is represented by elected officers. Although some of the general principles of fishing regulation regarding laying of nets and taking responsibility for damage to another fisher's boat or net are based on traditional fishing rules, most of the rules of this non-state legal system are, in fact, those of the state legal system.

Officers of the two boat owners' associations in Kakinada claim that they can impose fines for mesh size violations and fishing during the ban. They both stated that it was not possible for them to enforce the fishing zones which would exclude their members from fishing close to shore.

Many boat owners think that officers do not protect their rights and act in collusion with exporters, etc. This implicitly undermines their authority, as does the split between the two boat owners' associations.

A major role of their officers is to mediate in compensation claims between their members and small-scale fishers who are represented by caste elders. The interactions between the non-state legal system of the small-scale fishers and the non-state legal system of the mechanised boats have well organized procedures. These inter-actions are most successful when conflicts are resolved by the fishers from these two sectors themselves. As we have seen, only a few of the incidents involving small-scale fishers and mechanised boat fishers are brought for adjudication. However, in most cases the small-scale fishers are unable to receive any compensation. Even in those cases where it is agreed to pay compensation, the officers of the boat owners' associations cannot enforce the adjudication.

Therefore, the interaction between the two non-state legal systems fails to enforce the rules. The case elders and the presidents of the boat owners' associations all agree that it is the responsibility of the Fisheries Department to enforce the rules.

6.1.3 State Legal System: Fisheries Department

The state legal system of the Fisheries Department has rules to protect the resource health and the resource distribution of both fishing sectors. However, it does not have the power to enforce them. Their officers believe that the rules cannot be implemented without the cooperation of the fishers themselves.

6.2 MODIFICATIONS OF FISHING PRACTICES AS A CONSEQUENCE OF THE LEGAL PATTERN

6.2.1 What Has Been Modified?

Seed Nets (State Legal System Rule: State and Non-state Legal Systems Enforcement)

There has been a drastic change in the numbers using seed nets. This is largely due to the decrease in price for shrimp seed. The state legal system has had some influence: a) some nets were confiscated by Fisheries Department officers; and b) the Fisheries Department has been pro-active in holding information meetings to inform fishers of the damage that is caused to future stocks by their use. The role of the non-state legal system has been limited. The caste elders did urge villagers not to use them. However, they showed little interest in enforcing the ban on seed nets. Many, particularly the poorest, continue to use them. Merchants come every day to buy from villagers. The reasons for the lack of enforcement by the caste elders are linked to their source of authority. They cannot expect fishers to comply with rules which will substantially undermine their livelihoods.

Seasonal Ban on Fishing (State Legal System Rule: State and Non-state Legal System Enforcement)

There seems to be enforcement of the ban within the mechanized sector. Fishers were resentful that the small-scale fishers did not adhere to the ban. This goes against the principle of equity. The presidents of the two mechanised boat owners' associations also claimed that the ban was enforced because mechanised fishing could be controlled easily since all fishers must land at the harbour. However, research was not done during the ban period to confirm this assertion.

Within the small-scale sector, the situation is confused. In Mulapeta, where there are no motorized boats, the ban is not enforced. The reason given was that it would be unreasonable to ask fishers to stop fishing for six weeks. Furthermore, evidence was given of another village where a caste elder was assaulted for trying to enforce the ban. On the other hand, those communities with large numbers of motorized boats uphold the ban. In 2004, the Andhra Pradesh government stopped the ban for the small-scale sector, although none of the small-scale boat owners interviewed knew of the change and some did not know there ever was a ban.

Ring Net (Non-state Legal System): non-state and state enforcement

This has been stopped by the caste elders because their use gave an unfair advantage to those who owned them.

Rights of Vadabalija to Fish in Rivers (Non-state Legal System): non-sate and state enforcement

Due to their numerical power, the Vadabalija have changed the rules through mediation of the caste elders. The rule of equity has been applied. This has had a deleterious effect on resource distribution for the Agnikula Kshatriya who in villages adjacent to Mulapeta are financially, politically and numerically weak in comparison with Vadabalija.

6.2.2 What Has Not Been Modified

Separation of Territories- Fishing Zones (State Legal System Rule)

There is a total failure by the legal pattern in enforcing fishing zones. Neither of the two non-state systems nor the state legal system can enforce this rule. This is the major problem identified by small-scale fishers. 'The trawlers are stealing our livelihood'. Ironically, most of the fishers interviewed in both sectors thought that the rule was reasonable and equitable.

However, those with motorized boats and those in the under-resourced mechanized sector argued that it was unreasonable given their declining incomes. The smaller mechanized boats and the motorized boats cannot afford expenditure on diesel in the context of: decreasing prices for shrimp and the increasing costs of diesel.

Those boat owners with greater assets fish beyond the 23 km because the fish stocks are greater there. The government has increased the oil subsidy; but it is not sufficient. Another reason is the difficulty in identifying boats which is the first step for addressing these disputes within the non-state legal system.

Mesh Size Regulations (State Legal System)

There is no compliance with regard to shore seines. Caste elders thought that the rule was unreasonable. Some of their target species could not be caught with a larger mesh. Among the boat fishers, there appears to be a great deal of compliance. It is claimed that the mechanized sector complies with these state regulations through their own non-state legal system with support from the state legal system if necessary.

6.2.3 Affect on Incentives

Modifications in the legal pattern have not changed incentives very much. What has changed incentives is the declining CPUE. This has led to:

- increasing diversification of gear, timings, area of fishing activities in both sectors
- changes in the remuneration for mechanized crews that is less advantageous for crew
- some boat owners selling their boats and doing small-scale fishing or trading.

- some evidence of decreasing labour availability for shore seines because of fishing diversity in rivers, teppas, etc. At the same time, more are investing in shore seines. Hence, greater demand for shore seine crew who can demand higher non-returnable advances

6.2.4 Differential Impacts

All mechanised boats have been affected by the seasonal ban. While the mechanised fishers are observing the ban, the small-scale fishers are able to improve their catches substantially during the ban period.

The fishing zones have differential affects on the two mechanised boat groups. Those that are well resourced (sona boats) perceive only advantages to fishing within their zone or further out. Some complained about the industrial boats. The poorer resourced, smaller mechanized boats share the same zone, *de facto*, with small-scale fishers.

The biggest impact for small-scale fishers has been the ban on the seed nets. They say that they all made good money when they used seed nets. Their ban has reduced their earnings dramatically; but these decreased earnings from shrimp seed cannot be solely attributed to the ban.

Changes in the rules about river fishing near Mulapeta have drastically reduced the income of the Agnikula Kshatriya, while it has contributed significantly to the subsistence of the Vadabalija who fish in the rivers as an additional source of income.

Following the existing rules, as more fishers turn to shore seine fishing, the shore seine fishermen have lost territories to fish.

6.2.5 Level of Conflict

Territorial conflicts are increasing due to increasing competition at every level. This highlights that the rules of the three legal systems are difficult to enforce in the present context. Consequently, there is a growing tendency for the powerful to do what they want. Examples are: 1) marine fishers encroaching on river fisher's territory; 2) weaker shore seines being bullied by stronger shore seines; 3) motorised

boats versus teppas and shore seines; and 4) smaller mechanized boats versus other inshore fishers. In other words, inequity is increasing.

Within a broader context, there is increasing inequity between fishers and other stakeholders. In East Godavari District, the greatest threat to fishing is industrial development. Although fishing contributes a substantial proportion of Indian exports, it is in a weak position against the more politically powerful stakeholders backing industrial development.

6.3 THE EFFECTIVENESS OF THE LEGAL PATTERN IN MEETING RESOURCE ALLOCATION AND RESOURCE HEALTH GOALS

The Andhra Pradesh Marine Fishing Regulation Act addresses both resource allocation and resource health; but it is not able to implement the Act due to the limited resources of the Fisheries Department. The non-state legal systems are based on the principles of equity within their respective sectors. In this regard, they are primarily concerned with resource distribution, and little with resource health. However, they are unable to act effectively in implementing their rules when they interact with each other. Both non-state legal systems say that the state should enforce the rules.

There is general agreement that the rules of the state and the non-state legal systems, i.e. the legal pattern, are equitable and reasonable. The problem is not the rules but the context of declining livelihoods which is largely caused by declining resource health. Within this context, the structural limits of the legal pattern are not capable of enforcement and consequently additional strain is placed on both resource health and resource distribution.

END NOTES

[1] This term is also used for rafts and Kattla teppa. To avoid confusion, distinctions are made based on descriptions of different crafts as presented here.
[2] Venkatesh Salagrama, personal communication.
[3] All dimensions are based on boats and nets that the researcher measured, unless another source is cited.
[4] Cf. Vivkanandan et.al. 1997 on the problems of data. Comparison with data from other sources (Salagrama, e. al., 2003, Andhra University, 1978) have similar problems.
[5] The Annual Administration Report of Kakinada Fisheries Division of East Godavari District for the Year 2003-4 sites the total number of marine *alivi* nets as 228. Although the boundaries of the Kakinada Division are slightly different from those used in this paper, all the marine *alivi* net using villages in E. Godavari are included in my survey. Although I have more confidence in the data that my research team collected simply because some of my data has been verified from several sources, it cannot be assumed to be accurate in all cases. Another reason for not using Fisheries Dept. data is that the categories are more aggregated than mine. For example, no distinctions are made between different types of traditional crafts.

[6] There seems to be variations in the categories used by the Fisheries Department at different times.
[7] This information is directly quoted from the type-written document kindly supplied to me.
[8] There is a BLC union with about 1000 members in East Godavari District about which I have no details.
[9] In several villages, the Rama Temple is the central temple for fishers. How common this is or the significance of Rama for fishers is unknown and will require further research.
[10] These villages are: Konapapapeta, Mulapeta, Uppada, Ameenabad, Subbampeta, Suryaraopeta, Pedha Vakalapudi, China Vakalapudi, Kottha Kakinada, and Dhummulapeta.
[11] The 2001 census does not segregate the population into castes. The figures cited are based on the Multipurpose Household Survey (2003) which is known to be inaccurate.
[12] Initially there was a condition that those who wanted to be member of the committee must abstain from alcohol with the intention of maintaining a good quality of life for fishermen. This condition does not appear to apply today.
[13] Salagrama, personal communication.
[14] The fishing year for shore seines begins at the end of fishing ban. It is interesting to note that the fishing year for different modes is different. It may also vary from village to village depending on the major gods that are worshiped. Also, the fishing year for the Fisheries Department is different, from July to 30 June the following year.
[15] Boat owners' association owners association in Yanam-Bhairapalem is not included in this report.

REFERENCES

Andhra University Technical Cell
1978 A Study of Fisheries Development in the Coastal Districts fo Andhra Pradesh. Waltair: Andhra University. Pp. 1-186.

Bavinck, M.
2003. The Spatially Splintered State: Myths and Realities in the Regulations of Marine Fisheries in Tamil Nadu, India. *Development and Change* 34 (4): 633-657.

Bavinck, M.
1997 A History of Nets and Proscriptions in Artisanal Fishing: Restrictions on Technical Innovation Along the Coromandel Coast. *South Indian Studies* 3: 144-164.

Bay of Bengal Programme
1983 *Marine Small-Scale Fisheries of Andhra Pradesh: A General Description*. BOBP/INF/4. Madras: FAO.

Bush, S., P. Hirsch
2005 Framing fishery decline. Aquatic Resources, *Culture and Development* 1 (2): 79-90.

Chandrakanth, W.
2005 Nod for Visakhapatnam Steel Plant expansion soon. *The Hindu*. 10 May, 2005.

East Godavari District Planning Department
2004 *Handbook of statistics*: East Godavari District 2002-2003. Chief Planning Officer. Kakinada: East Godavari District.

East Godavari District Planning Department
2004b GDDP- East Godavari 2002-3

Gluckman, M.
1955 *The Judicial Process among the Barotse of Northern Rhodesia*. Manchester: Manchester University Press.

Government of Andhra Pradesh
1995a Act no. 9 of 1995. An Act to provide for the Regulation of Fishing by Fishing Vessels in the Territorial Waters in the sea Along the Coast line of the State of Andhra Pradesh and for Matters Connected Therewith. Hyderabad: Andhra Pradesh Gazette.

Government of Andhra Pradesh
1995b Andhra Pradesh Marine Fishing (Regulation) Rules, 1995. Hyderabad: Andhra Pradesh Gazette.

Government of Andhra Pradesh
2001 *Census*. Hyderabad: Andhra Pradesh Dept. of Statistics

Government of Andhra Pradesh
2003 *Multipurpose Household Survey/Human Development Survey*. Mulapeta, East Godavari District. Kakinada: District Planning Department.

Government of India
1991 Coastal Regulation Zone Notification. 19 February, 1991. Ministry of Environment and Forests.

Government of India
1996 Supreme Court Case: S. Jagannath and Union of India. Supreme Court Cases 87, December 11, 1996.

Hornell, J.
1920 *Origins and Ethnological Significance of Indian Boat Designs. Memoirs of the Asiatic Society of Bengal. Calcutta*. Reissued by South Indian Federation of Fishermen Societies. Trivandrum.

ILO
2000 *Risks and dangers in small-scale fisheries: An overview*, Sector Activities Programme 3.6/ Working Paper 147 International Labour Office Geneva, August 2000

Krishnaiah, P.
2004 Project proposal for development of community based fisheries management in Andhra Pradesh: Submitted for technical and financial assistance from external aid agencies. Department of Fisheries: Government of Andhra Pradesh

Kurien, J.
1998 *Small-Scale Fisheries in the Context of Globalisation*. Keynote paper presented at the Ninth Biennial Conference of the International Institute of Fisheries Economics and Trade. Tromso, Norway. July, 1998.

Kurien,J.
2000 *Factoring Social and Cultural Dimensions into Food and Livelihoods Security Issues of Marine Fisheries: A Case Study of Kerala State, India*. Working Paper No. 299. Thiruvananthapuram: Centre for Development Studies.

Madhusudhana Rao, T.
2004 Towards a second Green Revolution. *Frontline* (21) 24

Naik
2004 *Integrated development of AP Coastal Corridor with reference to Industrialisation*. Power Point Presentation.

Patnaik, S.
2005a Trawling turns into a sunset industry. *The Hindu*. 8 September, 2006.

Patnaik, S.
2005b Japan rejects shrimp consignment. *The Hindu* 6 May, 2005

Petersson, M.
2002 *Wild Shrimp Seed collection of Penaeus monodon in Godavari Estuary, Andhra Pradesh, India*. Minor Field Study 74. Uppsala: Committee of Tropical Ecology, Uppsala University. pp 27.

J.P. Platteau and A. Abraham
2002 Participatory Development in the Presence of Endogenous Community Imperfections. Journal of Development Studies 39(2): 104-136.

Ramasubramanian, R. (M.S. Swaminathan Research Foundation, Kakinada)
n.d. *Marine Regulations and Coastal Zone Management-Mangroves*. Handbook. SIFT: Kakinada.

Robben, A.C.G.M.
1994 Conflicting Discourses of Economy and Society in Coastal Brazil. *Man* 29 (4): 875-900.

Salagrama, V.
2003 *Traditional Community-Based Management Systems (TCBMS) in Two Fishing Villages in East Godavari District, Andhra Pradesh, India*. Case Study for the World Bank/SIFAR-funded project 'Study of good Management Practice in Sustainable Fisheries". Submitted to IDDRA Ltd, U.K.

Salagrama, V
2005 Traditional Community-Based Management Systems (TCBMS) in Two Fishing Villages in East Godavari District, Andhra Pradesh, India. In Cunningham, S. and T. Bostock (eds.) *Successful Fisheries Management: Issues, Caste Studies and Perspectives.* Delft: Eburon.

Salagrama, V.,J. Campbell, et.al.
2003 *SCL Project: Sustainable Livelihoods for the Coastal Poor*. Report on Phase 2 Socio-Economic Research. Exeter: IMM Ltd.

Sampath, V.
2003 *National Report on the Status an development Potential of the Coastal and Marine Environment of the East Coast of India and Its living Resources*. FAO/BOBLME

Sarma, S.B.
n.d. *Motorisation of Crafts*. Training Notes for the Livelihood Associates of Velugu Department. Kakinada: State Institute of Fisheries Technology.

Satyanarayana, B., Raman, A.V., Dehairs, Frank, Kalavati, C. and Chandramohan,P.
2002 Mangrove floristic and zonation patterns of Coringa, Kakinada Bay, East Coast of India. *Wetlands Ecology and Management*. 10:2002: 25-39.

Schoembucher, Elisabeth
1988 Equality and hierarchy in maritime adaptation: the importance of flexibility in the social organization of a south Indian fishing caste. *Ethnology* 27: 3 (1988: July) pp. 213-230.

Southwold- Llewellyn, Sarah
2005 Technological Innovation, Diffusion, and Management of Shore Seines in East Godavari District, Andhra Pradesh. Conference Proceedings of MARE conference. Amsterdam: July 2005.

Southwold-Llewellyn, Sarah
2006 *Cooperation in the context of crisis: Pulbic-private management of marine fisheries in East Godavari District, Andhra Pradesh, India*. IDPAD Working Paper No. 4. IDPAD: New Delhi and IDPAD: The Hague. www.IDPAD.org.

State Institute of Fisheries Technology.
n.d. Handbook. Kakinada: SIFT.

Subrahmanyam, N.V., K.V. Sivayya.
1978 *Study of Fisheries Development in the Coastal District of Andhra Pradesh*. Technical Cell. Waltair: Andhra University

Subramanian, T.S.
2003. A unique and lucrative basin. Frontline vol 20: 2 (Jan. 18-31, 2003) http://www.flonnet.com/fl2002/stories/20030131005210200.htm

Vivekanandan, V., C.M. Muralidharan, M. Subba Rao
1997 *A Study of the marine Fisheries of Andhra Pradesh*. Draft Report. Unpublished.

Websites:

http://eastgodavari.nic.in/kakinadaport.html
http://www.thehindu.com
http://www.thehindubusinessline.com
http://yanam.nic.in/statsyanam.htm
www.eximin.net/indianport/portlinks/privateports_template.asp?p=1

ANNEX: PHOTOGRAPHS

Mechanised boats

Poorly maintained mechanised boat (above)
Trawl net from mechanised boat.

Poor mechanised boat at Government Fishing Harbour

Fibre Engine Boat with Inboard Engine

Moored Fibre Engine boats and teppas at Uppada

Fibre Engine Teppa with Outboard Engine

Fibre Engine boats with disco nets

Fibre teppa with sails rolled up and using gill nets (below)

Fibre teppa with sail up

Karra teppa

Karra teppa in pieces

Kattla teppa

Kattla teppa or stitched plank boat

Kattla teppa, with another type of construction than those above

Close-ups of construction of kattla teppa

Raft construction. These rafts are used at sea and on rivers.

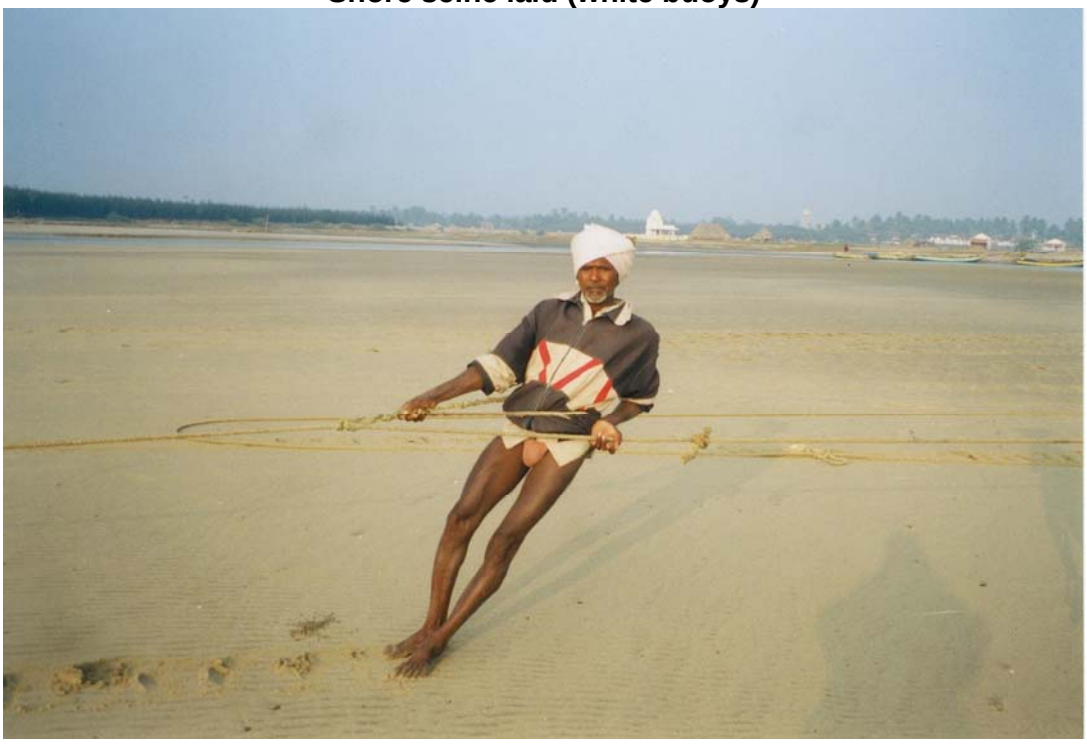
The nail is to support a sail at sea.

The Nava: shore seines are laid from this boat.

Rowing through the surf.

Below: Laying the shore seine from the nava.

Shore seine laid (white buoys)



Pulling in the shore seine

Loading shore seine onto nava

Last stage of pulling in the shore seine

Pulling in the shore seine

Shore seine being pulled in. Note large numbers of teppas near the shore seine. Also note the nava waiting in shallow waters.

Crew mending the shore seine

Kakinada nava preparing for river fishing

Shore seine used for river fishing

River fishing on a raft

Cast net fishing in river from raft

Below: A seed net

Kakinada Government Fishing Harbour

By-catch at Government Fishing Harbour

Drying the by-catch on the road

Unloading Kakinada navas at the Traditional Fishing Harbour at Kakinada

Woman Trader at traditional harbour

Bicycles of traders buying fish at traditional market

Village fishing landing centre. Fish in bags will be auctioned to women standing. Those squatting will take a few fish from each bag after the auction. These fish are also marketed and contribute to the subsistence of the very poor. Similarly, the fish that poor children take from the shore seine (see earlier photo) can be marketed.

Below: Trader selling fish and crab in the local market

Traders drying fish on village para.

Traders drying anchovy in the sand

Transporting a large catch from village to Government Fishing Harbour

Hatchery

Hatchery pipes obstruct using beach for shore seines

Aqua culture pond

Fishing Stake net across moat of industrial plant

Fishing boats with industries in the background

Competition between mechansied boats and non-mechanised boats

Competition between sail and motor boats

Paddy field in foreground. Motor and sail boats at sea. More boats moored close to shore.