INTEGRATED COASTAL MANAGEMENT

RESEARCH PROJECT ON GLOBALISATION AND SEAFOOD TRADE LEGISLATION: THE EFFECT ON POVERTY IN INDIA

Final Report for Andhra Pradesh

A Study done for
Natural Resources Institute,
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ICM

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Glossary

AP	Andhra Pradesh
BC	Backward Class
BCV Palem	Boddu Chinna Venkataya Palem (fishing village)
BLC	Beach Landing Craft
BOBP	Bay of Bengal Programme
CIFT	Central Institute of Fisheries Technology
CMFRI	Central Marine Fisheries Research Institute
DFID	Department for International Development – Govt of UK (formerly ODA)
DOF	Department of Fisheries
DWCRA	Development of Women and Children in Rural Areas (a development programme of the GOI)
EC	European Commission
EIA	Export Inspection Agency
EIC	Export Inspection Council
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FFP	Forum of Fisheries Professionals of India, Vizag
FRP	Fibre Reinforced Plastic
GDP	Gross Domestic Product
GOI	Government of India
Ha.	Hectares
HACCP	Hazard Analysis Critical Control Point
HSD	High Speed Diesel
ICM	Integrated Coastal Management
IDP	Inter Departmental Panel (for seafood processing unit inspection)
IQF	Individually Quick Frozen (Shrimp)
MNC	Multi National Corporations
MPEDA	Marine Products Export Development Authority
MT	Metric Tonnes
NGO	Non Governmental Organisation
NIRD	National Institute of Rural Development
NRI	Natural Resources Institute
OAL	Overall Length (of boats)
PD	Peeled & deveined
PHFP	Post-Harvest Fisheries Project (funded by DFID)
PHFRP	Post Harvest Fisheries Research Programme of the DFID, UK
PUD	Peeled & un-deveined
Rs	Indian Rupees
SAT	Supervisory Audit Team
SC	Scheduled Caste
SEAI	Seafood Exporters' Association of India
Spp	Species
UAE	United Arab Emirates
USFDA	United States Food & Drug Administration
WPR	Work Participation Ratio
WTO	World Trade Organisation

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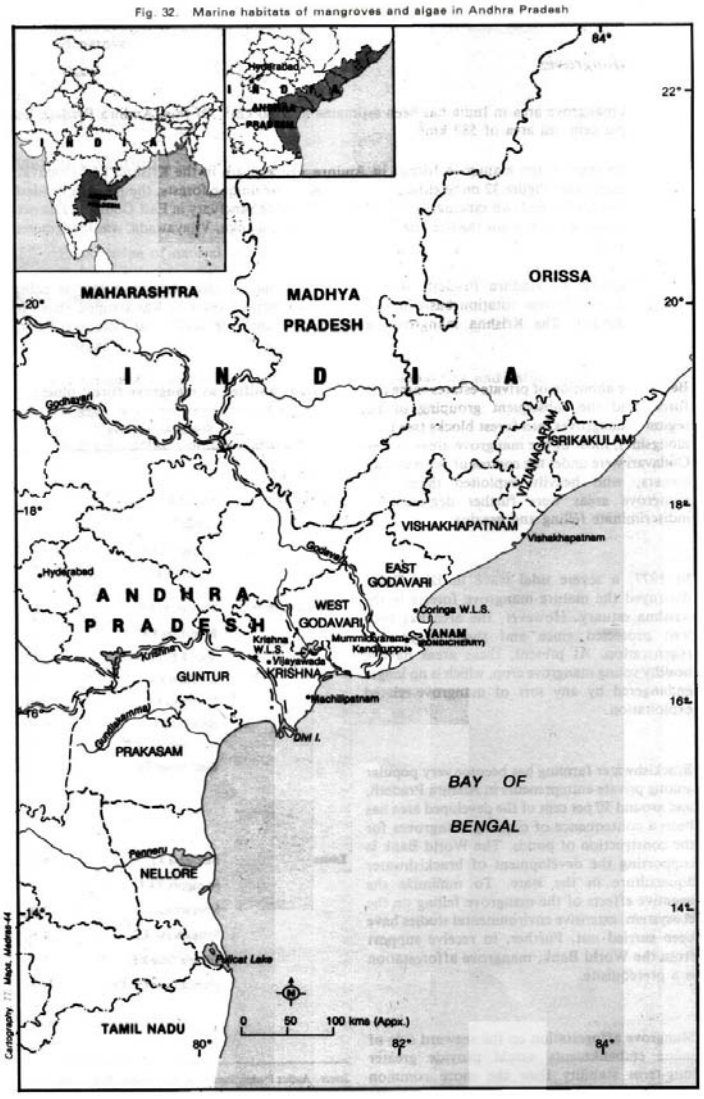
Map 1: Andhra Pradesh showing the nine coastal districts



Executive Summary

Since early 1970s, there has been a rapid reorientation of fish production systems in Andhra Pradesh towards harvesting exportable varieties. Andhra Pradesh has taken the lead in production of shrimp from brackishwater aquaculture (for export markets) and carps from freshwater sources (for ex-state markets). Capture fishing has undergone changes to reflect the emphasis on exports: fishing systems that traditionally depended on a mix of different species have begun to concentrate on fewer varieties with a good export value. New fishing gears such as trammel nets and long lines facilitated the process, while trawlers continued to capture shrimp by using nets with smaller mesh sizes.

While there have been efforts to diversify – by changing fishing grounds into deeper waters through the introduction of deep-sea trawling, by targeting alternative species such as Tuna, by using new fishing gears such as high-opening bottom trawls – these have largely remained unsuccessful, and shrimp has continued to be the focus of fishing and export operations.

Correspondingly, there has been a rapid growth in the infrastructure to facilitate exports of seafood – freezing plants, ice plants and cold storages have come up in areas that have the production/processing/export facilities, rapid transport became possible as a result of good roads laid to connect most of the remote fishing villages, telecommunication systems facilitated quick exchange of information between the producers and the buyers and all these changes have had an impact on the way fish are caught, processed, and traded.

The composition of exports from Vizag Port reflects the general 'low-volume-high-value' trend of the east coast. The volume and value of exports from Vizag Port have shown a consistently increasing trend through the 1990s. Japan has been the most important importer of seafood from Vizag Port, its imports accounting for 75% by volume and 86% by value of the total exported from Vizag. The US is the second largest importer of seafood from Vizag Port, followed by China, a number of Southeast Asian countries and the EU. Thus the impact of the EU ban on the seafood exports from Vizag was only minimal.

With respect to shrimp, the cultured varieties have come to dominate the exports constituting nearly two-thirds of the quantity and 75% of the value of the total shrimp exports from the state. There has been a corresponding decrease in the exports of captured shrimp in real as well as percentage terms. There has been a steady increase in the quantity of finfish in the exports through 1990s. There are indications that the finfish constituents are continuing to increase in the overall exports from the state.

Increased exports have meant the establishment of long chains of product flow and intricate networking between the various players involved in the activities both directly and indirectly. With the change in the market channels for different seafood items, came a wide range of new players into the marketing systems. Commission agents, middlemen, carriers and transporters, truck operators, peelers and processors, packers and handlers, exporters and processing plant operators, ice makers and ice sellers, besides technicians, crate and basket makers, etc., have all found a place for themselves in the rapidly evolving export chains. One consequence of the

existence of a large number of intermediates is that the pricing mechanisms are influenced by them, often depriving the fishers of their rightful share.

There are no serious indications that increasing exports have taken away traditional livelihoods on large scale. The increased emphasis on shrimp may have meant that many traditional fishing operations that were facing problems with poor catches of fish could manage to remain viable for a period.

Activities such as shrimp peeling by women, though practiced, are however confined to important port areas like Vizag, Kakinada, Machilipatnam and Nizampatnam, and where they have been closed over the last decade, it had to do with reasons other than changes in the seafood trade legislation.

The poor in the export sector mostly fall into the 'invisible poor' category, with very little known about their roles, numbers and the impact of any changes on their livelihoods. Even the apparently well-off categories of the poor are seen to fall into the category of 'potential poor' or 'tomorrow's poor'. Unfortunately, there is little quantitative or qualitative information on the various categories of people working in the export sector, in particular in relation to the impact of changing export trends, seasonality and shocks such as ban on exports on their livelihoods. Most of them not recognised as being direct stakeholders in the export sector, or even in the fishing sector in general, and being unorganised, current policy making largely bypasses them. Consequently, their capacity to access institutional support remains weak. There are indications that their vulnerability is increasing as a result of changing seafood legislation (which emphasises the need for more formalised systems of operation) and, more importantly, decreasing availability of shrimp from the natural sources.

The changed seafood legislation in late 1990s did not have an apparent direct impact upon many people outside the processing and export categories, but there is evidence that there were long term, indirect, trickle-down effects at all levels. Currently, the quality control systems do not extend beyond the processing plants, and the existing conditions at the landing, handling and pre-processing areas leave much to be desired. Similarly, the use of potentially harmful substances – such as antibiotics in the aquaculture sector – remain largely uncontrolled.

There are however indications that quality consciousness has been growing amongst different stakeholder groups. Use of ice, better handling, packing and transportation systems are instrumental in meeting the quality requirements of the processing plants.

The government's efforts to promote and sustain the export sector are felt to be appropriate in some areas, but inadequate in others. That the seafood industry is variously covered under the mandates of different central and state government ministries makes things difficult to implement. Most processing plants have upgraded their production and processing systems to stand up to the international requirements. The government has extended support – technical expertise, technology and subsidies – to the processors in this respect.

There is a possibility for the legislations to become more stringent and widespread in due course in which case the impact upon the various stakeholders would be very serious. Coupled with the

problem of declining productivity in both the capture and culture systems, which is offset to a large extent by increases in value of exports, the application of more stringent quality parameters would have serious consequences for the producer groups. It is possible that the production and processing systems would become more streamlined, and in the process, the seafood export industry could get concentrated into fewer hands than before. The effect of such change on the poor would be serious, because it is the informal nature of several of the systems – production, pre-processing etc – that provides a livelihood for them.

It is suggested that a more people-friendly, people-empowering programme be taken up to ensure that the various stakeholders in the export commodity chain shall play a more productive role in improving the quality of the seafood exports without adversely hitting their own interests. In the short term, it is recommended that more emphasis be placed in raising awareness about quality amongst the different stakeholders, that efforts be made to make the seafood legislation less obscure and user-friendly and more uniform across the different countries within a region (i.e., EU), and that options for diversifying the seafood exports from the state be explored, in terms of increasing the commodities exported, in order to overcome the constraints that a single-minded emphasis on shrimp could give rise to.

Introduction

This study has been undertaken as part of a DFID-funded, NRI-managed, research project on "Globalisation and Seafood Trade Legislation: The Effect on Poverty in India". At a workshop conducted to initiate this research in India in June 2001, it was agreed that understanding the flow of the important seafood varieties from the landing centre to the export market would provide an idea of the different key players involved, their roles and responsibilities, as well as livelihood issues related to international seafood trade. Subsequently, a desk study discussing these issues was prepared for Andhra Pradesh during February-April 2002. Following upon the desk study, it had been agreed to do a more elaborate field study, which attempts to characterise the export commodity chains in Andhra Pradesh, the key participants involved, and to understand the implications of any changes in the international and domestic seafood legislation on the sector in general, and on the livelihoods of the poor people working in the sector in particular, and this report is the joint output from the desk study and the field studies conducted by Integrated Coastal Management for Andhra Pradesh during May-July 2002.

Structure of the report

The rest of this chapter is devoted to explaining the methodology of information collection for this study, and to explain the limitations of the study. The next chapter begins by providing some background to the state of Andhra Pradesh, followed by a more elaborate description of fisheries in the state, which includes the fishing and fish culture methods, fish and shrimp catches and a description of the various participants involved in the export commodity chain, including the institutions involved in promoting and controlling the seafood exports from the state. It then goes on to discuss poverty in the export commodity chains in the state, by providing a general description of poverty as well as in terms of its effect on selected groups of stakeholders.

This is followed by an analysis of export performance of seafood from Andhra Pradesh through Vizag Port – using commodity-, quantity-, value-, and country-wise data from the secondary sources. The next section is devoted to discussing the impact of the EU ban on Indian seafood in 1997, and the subsequent changes in the conditions for export into the EU, as well as the adaptations to the changed export legislation by the government and the industry. It concludes by giving some recommendations for future action by the government as well as the industry in terms of equipping themselves for the rapid changes that have been taking place in the seafood legislation across the world as a result of the WTO and other international trade agreements, as well as the national legislations of the importing countries.

While explaining the current situation, the study also aims to highlight the gaps in the current knowledge and understanding of the issues related to seafood export trade in order to indicate the ways in which this research could go in the next stages.

Research methodology

This study has been undertaken in two stages. In the first stage, a desk study was done to ascertain the seafood export chains pertaining to Andhra Pradesh using the following sources of information:

(i) Secondary sources – reports (MPEDA, DOF, BOBP, DFID-PHFP, PHFRP, ICM, SWEDMAR), journals (***Fishing Chimes***), papers (workshop papers) etc.
(ii) Interviews with key stakeholders in two urban centres (Kakinada and Visakhapatnam) and four rural areas (BCV Palem, Uppalanka, Uppada and Nakkapalli), and
(iii) From observations at the landing, processing and trading centres.

In the second stage of the study, conducted during May-July 2002, comprehensive field studies were taken up in selected locations to obtain a more exhaustive understanding of the export channels, the key participants in the process, their livelihood profiles, poverty issues in the export sector and the actual and the felt/potential impact of past and future changes in international and national seafood legislation on their lives and livelihoods.

Site selection including brief description of areas studied, justification

Fisheries in Andhra Pradesh is a highly diverse activity, and to obtain a general picture of the complexity that characterise the sector, it is necessary to select sites which represent a wide cross section of activities, processes and people.

Site selection was determined by four factors, which were considered relevant in the context of understanding the export chains and their impacts on the poor:

i. The geographical features of Andhra Pradesh coast that give rise to particular kinds of fish capture and culture systems in each zone;
ii. The concentration of particular fishing systems (capture/culture, artisanal/ mechanised, small-scale/large-scale etc) at particular locations in each zone;
iii. The predominance of export species in the total produce from an area; and,
iv. The representative-ness of the sites being studied for enabling generalisations across the state.

The main sources of export varieties produced in the state are the marine capture fisheries and brackishwater culture fisheries. In marine capture fisheries, mechanised sector is almost entirely dependent on the export species (shrimp, to be exact), while artisanal sector contributes a sizeable percentage of the shrimp produced. Within artisanal sector, a distinction becomes necessary between motorised and non-motorised sub-sectors because there are three major variations between them in terms of: (i) the economics of operation, including the distribution of incomes; (ii) the areas and seasonality of fishing, and consequently the dependence on the export species; and (iii) more importantly for the purpose of studying poverty issues, in terms of the differences that exist in the livelihood and poverty profiles of people dependent on each system. Another distinction that would need to be borne in mind is that in the motorised sector, the owners and the crew are often distinctly separate entities – in terms of their social and financial status, participation in fishing operations, share in investments and returns, whereas such distinction between the owners and the crew is far less perceptible in the non-motorised sector.

In the brackishwater aquaculture sector, while it was found useful to classify the activity into small-scale (i.e., small landholdings of about 1-2 ha area, mainly subsistence-level operations) and large-scale (more than 2 ha area, mainly commercial farming operations), one distinction

that had been apparent within the large-scale sector was in terms of the ownership – between the farms owned by single individuals or groups of individuals, and those run by corporate firms. Their scales of operations, integration of different components of production and export under one roof, ability to invest etc., vary and it might not be wrong to categorise the former category as medium-scale operators. There are obviously other criteria (extensive vs. intensive, local vs. non-local etc.) that could be used for categorising people in the culture sector, but for the purposes of this study, classifying them into large-scale and small-scale seems to have been appropriate enough.

The one important difference between seafood and the other export-based industries is the fact that while the others need to be established where some basic facilities exist – for instance, access to shipping ports, transport and communication facilities and such like, in case of former, these facilities tend to get established around areas where seafood is produced in good quantities. In Andhra Pradesh, the growth of aquaculture has been mainly responsible for an incredible growth in infrastructure and other support services in often remote and inaccessible areas, such as West Godavari, Krishna and Nellore districts. It is a fact that the forward linkages – middlemen, traders, agents, processors, packers, and exporters – tend to become established according to the supply sources, the export supply chains were studied beginning from the point of production, and following the progress of a product along successive points in the chain until it reached the exporters.

Table 1: Sites selected for field research with different stakeholder groups

SUB-SECTOR	**CATEGORY**	**LOCATIONS**		
		North	**Central**	**South**
Small-scale motorised boats	Owners	Chepala Uppada	Uppada	Vodarevu
	Crew	Chepala Uppada	Uppada	Vodarevu
Small-scale non-motorised boats	Owners & crew	Budagotlapalem	Tallarevu	
Mechanised (trawl) sector	Owners	Visakhapatnam	Kakinada, Machilipatnam	
	Crew	Visakhapatnam	Kakinada, Machilipatnam	
Aquaculture	Farm owners: large scale			Nellore
	Farm owners: Medium scale		Tallarevu	
	Farm owners: small scale		Tallarevu, Machilipatnam	
Trading	Exporters without processing plant	Visakhapatnam		
	Exporters with own processing plant (EU approved)	Visakhapatnam		Nellore
	Exporters with own processing plant (Non EU approved)	Visakhapatnam	Kakinada	

Capture sector:	Company agents	Visakhapatnam	Kakinada	
	Commission agents: Large landing centre	Visakhapatnam	Kakinada	Nizampatnam
	Commission agents: Small landing centre	Budagotlapalem	Uppada	
	Independent traders	Visakhapatnam	Kakinada	
Culture sector:	Company agents		Tallarevu, Bhimavaram	
	Commission agents		Tallarevu, Bhimavaram	
	Independent traders		Tallarevu, Bhimavaram	
Processing	Peeling workers	Visakhapatnam	Kakinada	
	Processing plant workers		Kakinada	
	Ice plant owners	Visakhapatnam	Kakinada	

As can be seen, consideration was given when selecting a site to the importance of that location in providing a perspective on seafood commodity export chains in the state, and this meant that giving equal representation to all three zones was a secondary criterion. In terms of actual field research, usually a stakeholder group in one main location was studied in detail, and by conducting a similar exercise in at least one other location elsewhere – generally in another zone, where the possibility of variation between the systems could be high – the information was validated and/or supplemented.

In the north zone, Visakhapatnam dominates the capture fisheries activities and is also the only export point for seafood within Andhra Pradesh; hence it is considered the most important location for studying both the capture fishing activities as well as the export chains. Visakhapatnam plays host to the largest number of mechanised fishing boats on the east coast of India, and the mechanised boats from all other important centres in the state – Kakinada, Machilipatnam and Nizampatnam – spend long periods in a year fishing from here, hence studying the dynamics of operation in that sector in Vizag is considered to give a very good idea of mechanised fishing operations in the state. The information thus obtained was validated and refined in the light of research done at the second largest fishing harbour in the state – Kakinada, followed by Machilipatnam and Nizampatnam.

In terms of diversity in the fisheries sector – both capture and culture – the central zone of Andhra Pradesh, stretching from Kakinada to Nizampatnam is considered the most important location, consequently field research related to mechanised, motorised and non-motorised fishing units in the capture sector, and small-scale and large-scale (individually owned) aquaculture systems in the culture sector has been largely conducted there, which is validated against information for the same categories in one or both of the other two zones wherever possible.

Considering the importance of small-scale aqua-farming in terms of its livelihood potential and relevance for poverty studies, and also that brackishwater aquaculture is entirely dependent on export markets, people belonging to this category were studied in Krishna and East Godavari districts, where the largest concentration of the small-scale brackishwater aquaculturists is

reported. Corporate aqua-farming is largely confined to Nellore district, and thus the field research for this particular category was conducted in Nellore alone.

Field research tools/approach

The field research depended on group meetings, focus group interviews, individual case studies and personal observations at the landing and processing centres. Where possible and appropriate, interviews were conducted with the institutional stakeholders (Government and NGO functionaries, representatives of grassroots level groups, etc.). The methodology used was largely participatory, often using checklists, and recourse was taken to tools such as village maps from time to time as necessary.

All Stakeholder Meeting

Field research at a location began by holding a meeting with all stakeholders involved in fishing/aquaculture related activities in that location. The purpose and scope of the research would be explained in the meeting, and different export-oriented stakeholder groups located in that area were listed, along with details of their numbers, dominant gender and age characteristics, and social and economic status as perceived by the community members themselves.

Initially, it was assumed that it might be useful to segregate the various categories of people into fulltime and part-time dependents on export trade, but the export-oriented stakeholders in many cases – apart from those working in the processing plants and in exporting firms – were found to be involved at least part-time in other activities as well, which could be within the fisheries sector, i.e., petty fresh fish trade and dry-fish production, or in other sectors – i.e., agricultural wage labourer, industrial workers, building workers etc. Under the circumstances, considering the varying degrees of involvement of the stakeholder groups in export trade related activities at different times of the year, it was difficult, and often arbitrary, to try to characterise them as *specifically* export chain stakeholders[1].

For the purposes of this study, 'export-chain stakeholder group' is taken to mean *any* group of people involved in producing, processing and trading in seafood for export purposes, and this would include all those who might have other sectoral/livelihood affiliations and for whom export supply might be a primary or secondary occupation. This includes the 'direct stakeholders', i.e., who have a direct stake in the sale of the product to the next buyer – fishers, processing plant owners, commission agents, exporters – as well as 'ancillary participants', i.e., wage earners depending on seafood trade – peelers, sorters, graders, packers. Obviously, some distinction was necessary between the important and the unimportant players, otherwise there was the danger that virtually every person having anything to do with the sector could get branded as an export-chain stakeholder, and thus, while some categories, like ice plant owners, basket weavers, do play significant role in exports, they received less attention in this study on assumptions such as that the role of the specific group of stakeholders was much wider than to be confined to the export sector alone. These assumptions were validated beforehand in the community meetings.

[1] Obviously, this has implications in many other aspects relating to the livelihood issues as well.

From the list of all export-chain stakeholder groups, some of the more important ones (in terms of number, representative/distinctive character of their work, role in the export chain etc.) would be selected for in-depth studies over the next few days. The members of these selected groups would be asked for a time of their convenience when the researchers could meet them for discussions over the next few days and a schedule was drawn up for meeting all groups during the period the team was in that area.

Export Chain Stakeholder Group Meetings

While it was possible to have group interactions for certain categories – boat owners, crew, processing plant workers, etc. – it was not possible to do so for others such as aquaculture farmers, processing plant managers and owners, commission and company agents etc. Individual interviews were conducted with such people, which were validated by conducting similar interviews with more than one informant in each location. Where possible more than two such interviews were conducted (in some cases, such as in the case of commission agents, the number of interviews at a location went up to 5), but in no case was the number of interviews less than two. The information thus collected about a particular category of people was then compared with similar information collected elsewhere to crosscheck and, as far as possible, to draw out a general understanding of that group.

The interactions with each group consisted of informal discussions, using a checklist prepared for the purpose. The checklists provided as part of the TOR for the study were used to develop a generic format for interviewing all categories of stakeholders. One of the researchers would act as the interviewer while the other took notes. At important locations like Vizag and Kakinada, three or four researchers were employed to facilitate the process of asking questions and recording it adequately. Informal interviewing methods, using checklists, yielded most of the required information, and they were backed up with triangulation, visual observations and other validation procedures every time.

If a group provided an interesting or important insight into the key trends in the export chains, this would be taken up for further discussion either with the whole group or with a few individuals. This information was used to develop case studies for illustrating changes in the export chains over time. Detailed notes were prepared after each interview, and for the purposes of reporting, the information from the same stakeholder group in different areas is presented as one report in which the variations if any are reflected.

Poverty Assessment

It should be noted that poverty assessment done as part of this study largely concerned itself with the economic aspects of poverty (low wages, uncertain incomes, poor catches, mounting investment needs, etc.) and the other features (social, cultural, political, tenurial aspects, among others) were discussed when they have a direct bearing on the economic well-being of the poor.

Attempting to look at the export sector participants – let alone the poor in the export sector – as an entity in themselves is fraught with much uncertainty. Moreover, poverty itself is a very broad concept and to try and arrive at any conclusions about poverty amongst the export sector

participants requires far longer time than was available to the team. It would be even more difficult to try and put poverty in the export sector in the context of poverty in the fishing sector generally in the state or even in a village. Experience has shown that there are many problems with trying to compare the export categories with others in the non-export category in terms of the generalisability of such results across the state, unless a sufficiently big sample was selected, which was not possible to do in the time available.

Poverty assessment was done using the same tiered approach as explained above: (i) at the community level to understand the broad contours of poverty in the village, (ii) at the particular stakeholder group level (non-motorised fishing crew, processing plant workers etc) to characterise poverty as it pertains to export sector in general and to the specific groups of 'Export Poor' in particular, and some times – albeit cursorily for lack of time – at the individual household level to see how the features of poverty as described at the higher levels translate in action at micro-level.

At the All Stakeholders' Meetings, a poverty assessment was undertaken. Firstly, a few criteria for characterising a group as being 'poor' would be established using the participants' own perceptions (seasonal unemployment, poor and/or uncertain wages, lack of food during certain periods of year, inability to send children to schools etc) and using these criteria, those groups which would fit the category of poor from among the list of export chain stakeholders would be identified with the assistance of the community members. This would necessitate listing not just the export chain stakeholders, but also all livelihood groups in the village, in order to obtain a comparative understanding of where the export poor stood in relation to the other poor in the community.

This kind of information was not often available in any of the available secondary data, either at the state level, or at the landing centre/village level. Considering that most poverty assessments are confined to somewhat problematic (and often difficult-to-verify) indicators such as income, nutritional standards, etc., it is increasingly becoming important to characterise poverty using a host of other criteria – caste, occupational status, gender, age, vulnerability, etc (see NIRD, 1998). Thus, notwithstanding the difficulties associated in defining a 'diffuse' group of people such as the 'Export Poor' amongst a wide range of people in similar operations (fishing, fish processing and trade etc.), an attempt has been made in the research to see how far it would be feasible to isolate and characterise the poverty of the Export Poor. DFID's Sustainable Livelihoods approach was used as a general guiding principle for eliciting the information about poverty, and ICM's previous and ongoing work into poverty in the coastal communities also came in handy at various points.

Limitations/Constraints

Some of these limitations are more like areas that need future work from the project rather than confined to this study alone. Those that are specific to this study are discernible easily enough.

Obviously, in a sector that is characterised by diversity, as the fisheries sector in Andhra Pradesh is, no single chain of export flow, or no general characterisation of the whole sector can hope to be valid across all places and all times. Obviously, any such attempt masks more than it tells,

diverts more than it focuses, and this will need to be borne in mind whenever categorical statements are made in this report, particularly concerning livelihood issues. The primary information for this study comes from about 20 locations altogether, and the choice of the locations themselves of course has implications for the kind of information obtained. At a generic level, we believe that most research findings in the report are valid, but the details may vary from place to place.

The quality of the conclusions drawn based upon secondary sources is obviously dependent on the quality of the information available. Enough has been said and written about the lack of information on the people involved in the fishing sector, and in any research attempting to look at poverty and livelihood issues, it will be a serious constraint at best, and a major failure at worst. No statistics exist on the numbers of people involved in the fisheries sector in general and export industry in particular. Dearth of organisations for representing the lower sections (the 'working classes') of the export industry also contributes to this serious lacuna. That there exists no reliable information on the prices, margins and mark-ups for various products is less serious than lack of information on the people, particularly when it is well known that the prices etc are fluctuating anyway and are determined by a number of local, national and international factors from day to day. Consequently, the study remains more or less at a general level rather than point out specific groups of actors as being the beneficiaries or the victims of a particular change. What this has also meant in practice is that any issue can be argued from both sides – lacking concrete information on the people affected one way or the other, the force of most arguments derives from the exigencies of the moment than from concrete and verifiable data.

What is more surprising, and disturbing, is the fact that there is no single source of information to find out the total quantity of exports from Andhra Pradesh. The finding that nobody – in the government agencies or in the private sector – quite knows what quantity of seafood produced in Andhra Pradesh is exported needs to be taken seriously and efforts made to fill the gap as soon as possible to ensure that the claims on the need for increasing the quantum of exports from the state to be credible. Obviously, with hardly any scope for distinguishing the Andhra Pradesh product in the overall exports from Chennai, the study has had to remain more or less 'Vizag-centric', and all statements pertaining to exports – unless otherwise explained – should be taken to confine to Vizag alone. The fact that shrimp constitutes 80 percent of the total exports by quantity and 96 percent by value, has determined that the study should concentrate mostly on shrimp exports from the state.

It ought to be mentioned that many of the statistics presented in this report may have been analysed here for the first time, since their compilation, to draw out conclusions, and the strange crests and troughs some of the trends show from year to year are not always explicable – at least by this team of researchers. To the extent that the overall trend is considered to be reasonably valid, the figures should be taken to be valid too, but attempts to validate the exact percentages and quantities are hopeless and futile. Moreover, most of what passes for statistics is often dictated by considerations other than strict adherence to truth ("Is it good to show an increase in shrimp farms when an adverse court verdict prohibits aquaculture?" "Is it good to show a decline in marine shrimp catches when at the same time requesting for assistance to mechanise 200 new boats this year?") Being dependent on secondary sources for whatever statistics are available to it, this paper has perforce to depend on what it has available on the subject of seafood production

and exports, and drawing many conclusions, or stretching the implications of a conclusion beyond a point, based on the statistics as presented here is fraught with too many problems.

Considering that the only guide that provides a comprehensive idea of both the production and the export trends is the Handbook on Fisheries Statistics brought out by the DOF in the state, and considering that the latest one (for 1998-99) is at least three years old, the statistics also are confined to that period alone. It is true that more recent figures are available from MPEDA, but without the production figures from the DOF, it has not always been possible to present an updated picture.

General context of Andhra Pradesh

Andhra Pradesh, on the East Coast of India, is the fifth largest state in the country, both in area and population. With about 66.5 million people in 1991, it accounts for nearly 8% of the country's population. Males slightly outnumber the females (there are 972 women per thousand male), and about three-quarters of the population (48.6 million people) live in rural areas. With a density of 242 people per square kilometre, Andhra Pradesh is not as crowded as many other states in the country.

Bounded by Orissa and the newly-formed state of Chhattisgarh in the north, the Bay of Bengal on the east, Tamil Nadu and Karnataka in the south and Maharashtra on the west, Andhra Pradesh forms the major link between the north and the south of India. The climate is generally hot and humid, and the average annual rainfall in the state is about 125 cm., according to Malayala Manorama (2000), while Swaminathan (in NIRD, 1999: 144) gives an annual rainfall of 925 mm. The Krishna and the Godavari are the major river systems in the state.

Andhra Pradesh has a widely diversified farming base with a rich variety of cash crops. It is surplus in food grains, produces 10 million tonnes of rice annually and can rightly claim to be the granary of the south. Agricultural sector accounts for around 50% of the State's income and provides livelihood for 70% of the population. The state ranks fourth in industrial investments. The work participation rate (WPR) – defined as the percentage of total workers to total population – is 45.27% in Andhra Pradesh, as against 37.68% for all India, and Andhra Pradesh has the highest WPR (main + marginal workers) for females in the country. There has been a significant improvement in the literacy levels in the state between 1991 and 2001 – when it increased from 44.4 percent (55.1 percent for males and 32.7 percent for females) to 61.11 percent (70.85 percent for males and 51.17 percent for females).

About 15.4 million people, or 22% of the population in the state in 1991 was considered to be living under the poverty line. NIRD (1999) estimated that in 1993-94, poverty in the state had further declined to 15.92 percent. In the coastal areas, poverty is a class phenomenon, affecting only agricultural labour and other non-asset owning poor, whereas elsewhere within Andhra Pradesh, it is a region-wide phenomenon. Within the state, of course, there are inter-district disparities in terms of rural poverty.

Since coastal regions are the focus area for the purpose of this study, it might be useful to look at the conditions in coastal Andhra Pradesh. In Andhra Pradesh, the coastal regions have a poverty of 17.3%, inland northern parts 13.8%, South western parts 20.4%, and inland southern parts 12.9%, indicating that – contrary to all general assumptions – the coastal regions are not much different in terms of the number of poor people who reside there. In fact, when it comes to the zone-wise share of the poor in terms of the total number of the poor, the coastal regions seem to dominate the figures, accounting for as many as 48% of the poor in the state. The rural poor in the coastal areas of Andhra Pradesh are engaged in a wide diversity of occupations – 10.2% are self-employed in non-agricultural activities, 24.5% work as agricultural labourers, 21.2 % are engaged in other labour, 12% are self-employed in agriculture, and the rest are involved in miscellaneous categories of employment (NIRD, 2000a: 20). The data do not disaggregate the

numbers of people employed in fisheries; presumably they are subsumed under the agricultural categories.

In 1991, about 31 percent of the people in coastal Andhra Pradesh had access to pucca (or permanent) houses, 37 percent to safe drinking water, 31 percent to electricity, less than 8 percent to toilets, 33 percent to medical facilities, nearly 50 percent to post & telegraph services, less than 10 percent to taps, and it is worthwhile to note that in most of these categories, the coastal Andhra Pradesh lags behind the other three zones – inland northern, south western and inland southern – that make up the rest of the state (NIRD, 1999). In an overall ranking done for all zones in the country, coastal Andhra Pradesh receives a rank of 44, as against 31, 18 & 19 ranks received by the other three zones, indicating a poorer quality of life in the coastal region.

But there are indications that poverty in Andhra Pradesh is declining faster than in most other states, if not in the country as a whole. For instance, in 1993-94, poverty decline in Andhra Pradesh has been the highest among all states in the preceding decade. The processes leading to this are too complex to be presented here, but Swaminathan (in NIRD, 1999: 142-207) attempts a thorough analysis of changing pattern of poverty in Andhra Pradesh. In terms of the number of women's groups formed under DWCRA (Development of Women & Children in Rural Areas), the state leads the rest of the country, and it has been reported that the performance of these groups is fairly satisfactory on many counts.

There is a growing NGO movement in the state, which receives good encouragement from the state government. NGO participation in executing development projects is often solicited by the government, helped no doubt by the insistence of the international and bilateral funding agencies, including DFID and the World Bank, for the inclusion of a wide range of civil society organisations in poverty alleviation programmes. However, the NGOs' role in the fishing sector is small, and is generally confined to extending support services – credit, education, health etc. There is, however, a growing awareness about, and interest in, livelihood issues in the face of the trade liberalisation programmes on the one hand and the declining trend shown by important inshore fisheries – both overall production as well as catch per unit effort – on the other.

An overview of the fisheries sector in Andhra Pradesh

Andhra Pradesh is one of the eight maritime states of India, with a coastline of 974 km, which is about 12.5% of India's coastal length. The continental shelf area up to 200 metres depth is 33,227 km^2 (DOF, 1998: 5). Annexure 1 provides district-wise details of coastal length and the continental shelf area. The inland waters consist of 24,000 tanks, 102 reservoirs, two large lakes (Kolleru and Pulicat) and two large rivers (Godavari and Krishna). The state has 23 revenue districts of which nine are on the coast. There are a total of 508 coastal fishing villages and 508 landing centres (DOF, 2000: 59). The continental shelf area off Andhra Pradesh is narrow in the south of the state and widens slightly towards the north. Of the total area of the continental shelf about 53% is in the 0-50 m depth range (BOBP, 1983: 1).

Vivekanandan et al (1997: 1), among others, viewed the coast of the State as being classifiable into three zones: south, central and north. The three zones are distinct not only in terms of the geo-physical and environmental conditions, but also in the diversity that characterises the fishing systems, communities and cultures in each zone – a result, possibly, of the adaptations that a particular ecosystem requires on the part of the communities living in it. Thus each zone is dominated by one or two major fishing castes, each with its own systems (see Map 1).

(i) **North zone**: From Orissa border to Uppada in East Godavari. Open surf-beaten beaches. Traditional fishing craft: boat-catamarans, stitched boats. Shore-seines prevalent. FRP beach landing crafts, and other FRP boat are recent introductions. Vivekanandan et al (1997) have reported a new – indigenous – fishing boat, called 'Katla Teppa', in northern districts, and this has subsequently spread all over the northern zone[2]. Visakhapatnam, which is located in this zone, is the most important trawling base in the state.

(ii) **Central zone**: The central zone starts from Nizampatnam in Guntur district and extends to Uppada in East Godavari district. The most productive of the three zones. The rivers Godavari and Krishna discharge their waters, consequently the coast is shallow and the numerous creeks offer shelter for bigger crafts. Active creek-based fisheries also seen here. Kakinada, Machilipatnam and Nizampatnam are important trawl landing centres. FRP boats are a recent but very successful introduction in this area too.

(iii) **South zone**: The south zone extends from Pulicat Lake in Nellore district to Suryalanka beach in Guntur district. Similar to the North zone, but the catamarans here are raft-catamarans. Shore-seines are a relatively new phenomenon. Motorization of traditional crafts (Outboard motors on catamarans) widely prevalent. Not many trawlers, but few operate from Krishnapatnam harbour.

The state has some 372,000 ha of pond resources, 234,000 ha of reservoirs, two lakes with an area of 136,000 ha suitable for fisheries development (DOF, 1998: 7). In addition, there are numerous rivers including the Godavari, Krishna, Nagavali, Vamsadhara, Sarada and Pennar.

Although fish constituted an important part of the diet of people in the state, it is mainly the economic value of fish that spurred much of the fishing activity in Andhra Pradesh. The lack of

[2] The Katla Teppa is a kind of 'Back to Basics' craft, and is a hybrid of the different traditional (local) boat designs, using fairly simple materials and technology for construction. It is successful primarily because it is inexpensive to build and operate.

much demand for fish in the state ensured that large quantities of fish were mainly used for consumption by the poorer sections of the society as fresh or processed products (Vivekanandan et al, 1997: 74), while a large proportion of the fish was also exported abroad, and it is the latter that gave rise to a vibrant fishing industry in the state.

The fisheries sector also contributes very significantly to rural employment, particularly of the poorest groups. According to the Livestock Census of 1993, there were 872,000 fishworkers in the state of whom some 275,000 were actually engaged in fishing (DOF, 1998: 2-3). Another 112,000 were in fish marketing, while 22,000 were involved in fish processing. Fishworkers in coastal Andhra Pradesh number around 565,000 of whom about 200,000 are active fishers, nearly 80,000 are involved in fish marketing, 20,000 are involved in fish processing. In other words, 73% of the active fishers, 71.5% of those involved in fish marketing, 77% of the fish processors in Andhra Pradesh are working in the coastal areas (DOF, 1998:2-4). It is not known what percentage of the total workers in Andhra Pradesh are constituted by fishworkers[3]. Annexures 2 and 3 provide district-wise details of people involved in active fishing operations and allied activities in the state.

Fisheries in Andhra Pradesh[4]

Fishing Methods

In Andhra Pradesh, the fishing crafts can be broadly categorised into three types – artisanal (or traditional), motorised and mechanised, although the distinctions between the three categories are often very blurred, the classification being more a system of convenience than based on any strict criteria. It is possible to distinguish between the artisanal and the mechanised boats though, in that while the former uses sails and oars for propulsion, the latter depend on mechanical means of movement, i.e., inboard engines. The motorised fishing crafts are somewhat intermediate between the two categories. They are artisanal crafts equipped with engines for propulsion, and also include boats developed as replacements for traditional crafts, such as the FRP versions of different fishing boats, which are also motorised. They can be said to differ from the mechanised boats in that they take advantage of *both* manual and mechanical means of propulsion as suits their purpose from time to time.

In the context of Andhra Pradesh, mechanised boats are exclusively involved in trawling operations, although the size variations between different categories of mechanised trawlers are used to distinguish between mechanised boats (i.e., up to 14 metres overall length - OAL), 'mini'-trawlers (15-20 metres OAL), and large trawlers (over 20 metres OAL). All mechanised boats are heavily dependent upon shrimp, which constitutes more than 90 percent of their total income, as indicated by the trawler operators during the field research.

The state has the largest fleet of artisanal craft in all India, but relatively few mechanised boats. There are some 45,585 artisanal craft in the coastal waters of Andhra Pradesh with most of the

[3] According to 1991 census, the total population of the state was about 66.5 million (Department of Fisheries, 1999: 7), of whom, according to Swaminathan (in NIRD, 1999:144), workers constituted about 45%. A rough estimate, using these figures, indicates a total work force of 30 million people in the state, of whom fishers constitute a little under a million.
[4] Adapted, revised and updated from ICM, 2000.

craft occurring in the northern districts of Srikakulam (8,894), Visakhapatnam (7,302) and East Godavari (7,104) (DOF, 1998: 14-16). About 8.5 % of these craft were motorised in 1997, in comparison with 1992 when only 3% of the craft were motorised (DOF, 1993: 10). These vessels are engaged in day fishing trips although the larger boats carry out much longer fishing trips, particularly those fishing for sharks.

Distribution of fishing craft, main fishing gears and catches in Andhra Pradesh

Artisanal fishing fleet

As the following table shows, the coast of Andhra Pradesh harbours a wide variety of indigenous fishing crafts, each suited to fishing in a particular environment. There are variations within the same category – there are more than two varieties of catamarans operating from the northern zone, distinguished from one another by their size and the number of logs used, and the boat catamarans of the northern zone are distinct from the raft catamarans of the southern zone; similarly there are endless variations in size, depth, and functional features of the nava. All this means that the available secondary information on these fishing systems does not do full justice to their ability, adaptability and ingeniousness of design.

Table 2: Distribution of fishing crafts, their main fishing gears and fish catches in different zones

Fishing craft	Zones where represented	Main fishing gears used	Important catches
Catamarans	North and south (Marine)	Gillnets Trammel nets	Shrimp, small pelagics
Sandwich catamarans	North (Marine)	Gillnets Trammel nets	Shrimp, small pelagics
Small navas	Central (estuarine)	Gillnets, lines, tidal wall nets	Shrimp, crabs, estuarine varieties, Molluscan shells
Medium navas	Central (estuarine and marine)	Gillnets, trammel nets	Shrimp, medium sized fish (pomfrets, small seer, mullets) crabs
Large navas	Central (marine)	Gillnets, longlines	Seer, pomfrets, sailfish, sharks, etc.
FRP boats	All zones (marine)	Gillnets, longlines Trammel nets	Seer, pomfrets, sharks, Shrimp
Trawlers	All zones	Trawl nets	Shrimp, bycatch consisting of miscellaneous demersal fish.

Each of the boats has a distinct mode of fishing, the duration and the depth of fishing, fishing gears used and fish caught showing variations not only seasonally, but – in some cases, where fishing follows lunar cycles – daily. The shortest fishing trip could be about six to eight hours long (by the non-motorised catamarans fishing in 5-10 fathoms) and the longest could go up to 5-6 days (by the motorised long-liners fishing for sharks at depths of over 50 fathoms).

Mechanised fishing fleet

The main harbours for the mechanised boats are Visakhapatnam, Kakinada, Machilipatnam & Nizampatnam where adequate shelter and shore facilities exist. Visakhapatnam is the only deep-sea trawler base on the east coast of India. In 1998, there were 8,642 mechanised boats in the state, of which 1,738 were trawlers, 6,043 were FRP beach landing boats (DOF, 1998: 14), as against a total of 5733 boats in 1993, of which trawlers constituted 1,651 numbers, showing that the number of trawlers has increased only very slightly during the period.

The trawlers vary in size from 10 m to over 20 m in length. The smaller vessels go to sea for 1-8 days fishing mainly in the inshore coastal area of Andhra Pradesh or as far north as Paradeep in Orissa. The 14 m *Sona* type trawlers go to sea for voyages of 12-20 days, mainly in the area north of Paradeep. The 16-19 m twin rigged trawlers fish on the Sandheads off West Bengal and voyage for about 21 days. The larger, greater than 20-M trawlers also fish mainly on the Sandheads and voyage for 30-50 days (Gordon, 1991: 3-4; Rajendran & Swamy, 1992: 2-4). This last category – larger trawlers – has declined in importance over time, and from about 200 numbers in mid-1990s, the numbers have dwindled to less than 60[5] (Fishing Chimes; Salagrama, 1998: 151).

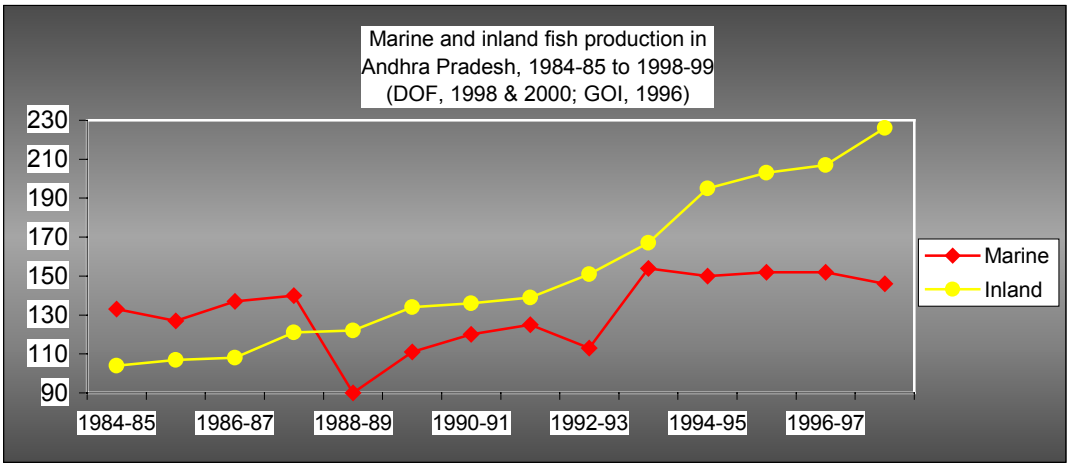
A number of shore seines (beach seines) are also in use in the northern and southern zones (Vivekanandan et al, 28-30). BOBP (1983: 23) notes that there were a little over 3,000 shore seines in the state in 1982, but the numbers must have come down significantly since then. The main catches from shore-seines include small pelagics, which are processed for human consumption or for poultry feed.

Fish production

Andhra Pradesh provides most of its own fish needs and exports some surplus to other states and overseas. In the 10-year period from 1985/86 to 1995/96, the total fish production in the state is reported to have risen from 234,350 MT to 355,960 MT, a 52% increase, which is slightly less than that for the country as a whole (58%) (GOI, 1996: 24-25). Marine fish production rose from 126,850 MT to 151,990 MT, a 20% increase over the period, but very low compared against a 63% increase for the country as a whole (GOI, 1996:21). Inland fish production increased from 107,500 MT to 203,970 MT, a 90% increase, as against a 51% increase for the entire country (GOI, 1996:22)). Annexure 4 provides year-wise production of marine and inland fish in the state from 1990-91 to 1997-98. In 1998/99 the quantity of fish harvested from inland sources was 260,829 MT (DOF, 2000: 31) and the marine production was 57.5% that from inland sources (DOF, 2000: 2). The total fish supply in 1998-99 is estimated at 455,685 MT (DOF, 2000: 21, 31, 34) (*Figure 1*).

[5] For a fuller story of the rise and fall of the deep-sea trawling fleet in Andhra Pradesh, see Vivekanandan et al (1997, draft)

Figure 1: Marine and inland fish production in Andhra Pradesh, 1984-85 to 1998-99



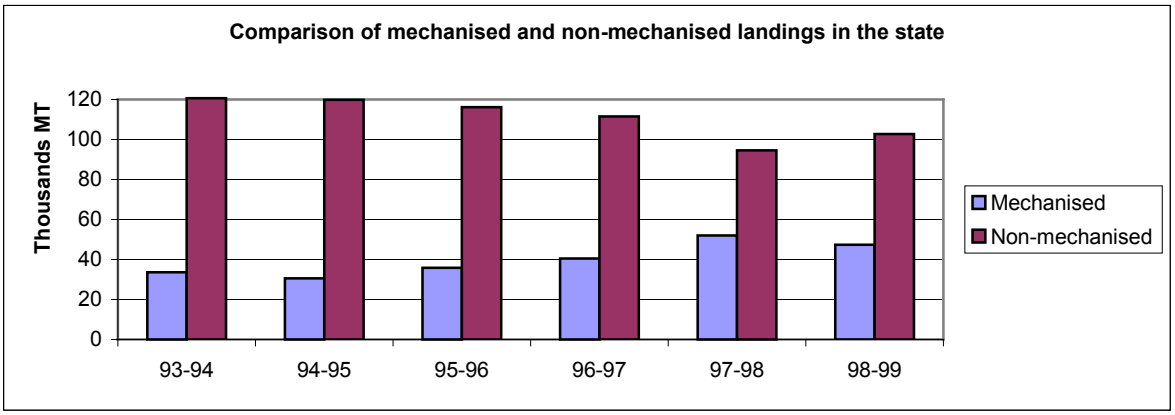
The factors responsible for the two 'dips' in the marine fish production in 1988-89 and 1992-93 remain obscure, and the answers ranged from poor fishing seasons to faulty statistics.

Marine fish

The marine fisheries of Andhra Pradesh are characterised by multi-species fisheries, which necessitate the fishing systems to be very versatile in terms of their ability to catch a diverse range of fish. The abundance of different species at different seasons in different parts of the coast determines the distribution of the fishing systems geographically as well as temporally.

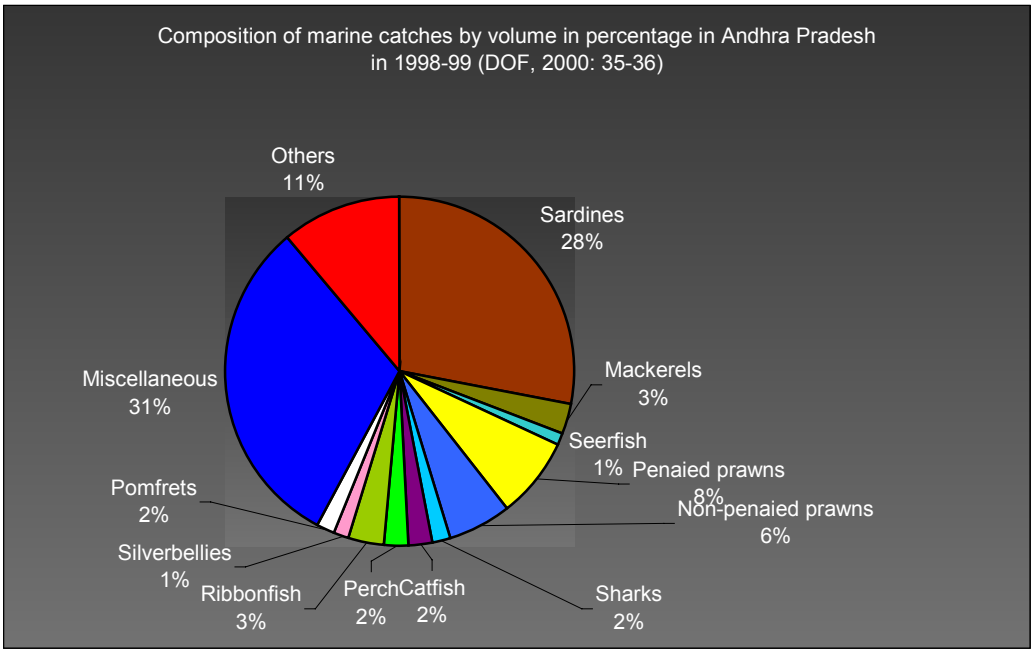
The marine catch landed in Andhra Pradesh during 1998/99 was 150,000 MT, which has remained almost constant since 1992-93 (DOF, 2000: 34) (Annexure 5). In 1998/99, 68.5% of the fishery was harvested by the non-mechanised sector (DOF, 2000: 38), down from 78% in 1993-94 (1994:5), indicating the dwindling contribution from the non-mechanised sector, both in comparison with mechanised landings and in absolute terms (DOF, 1994:5; 1997: 40; 1998:31). Obviously, the increase in mechanised landings came from non-target species, i.e., other than shrimp, considering shrimp catches have shown a decline during the period. The fact, however, remains that the non-mechanised sector still dominates the total marine production in the state by a ratio of 2:1 (*Figure 2*).

Figure 2: Comparison of fish landings by mechanised and non-mechanised boats in Andhra Pradesh



The marine fish catches in the state are dominated by clupeids (i.e., small pelagics such as sardines, mackerels, anchovies etc), which constituted about 22% of the total catches during 1997-98. Mackerels, seer fish, penaeid shrimp and non-penaeid shrimp, sharks, catfishes, perches, ribbonfish, silver bellies, pomfrets are the other important varieties landed. In terms of value, penaeid prawns (which constituted 7.6% of the total landings) accounted for nearly 59% of the total (DOF, 1999: 36,39) (*Figure 3*).

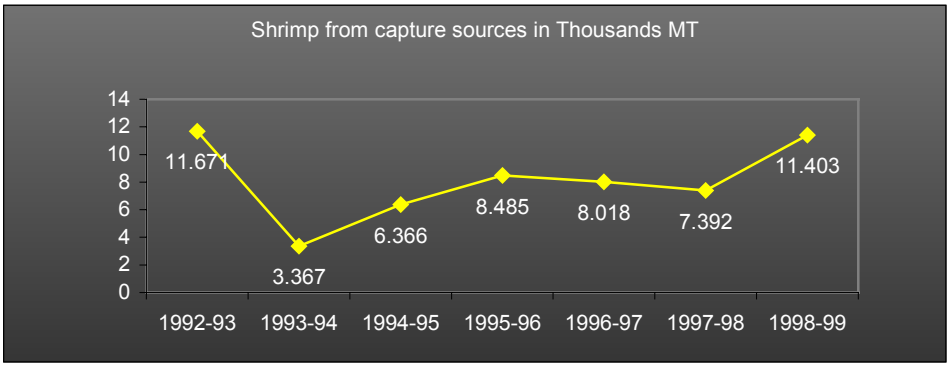
Figure 3: Composition of marine catches by volume (in percentage) in Andhra Pradesh in 1998-99



Andhra Pradesh is the largest exporter of black tiger shrimp in India, and until recently, shrimp captured from marine sources was the mainstay of this activity. Trawling and brackishwater aquaculture in the state are entirely centred on producing shrimp, of which black tiger constitutes a substantial part.

Shrimp catches from the capture sources in Andhra Pradesh have fluctuated widely through the 1990s, and have mostly showed a downward trend (DOF, various). The overall shrimp exports from the state however managed to grow thanks to the increased production from culture sources (Figure 4). The decline in the shrimp catches on the east coast of India is well established, and is attributed to (i) over-fishing by different categories of fishing craft, particularly the trawlers, (ii) large-scale capture of shrimp juveniles from the near-shore waters for culture purposes, (iii) pollution, and (iv) destruction of their natural breeding grounds – linked to a host of many direct and indirect factors – excessive fishing, industrial, agricultural, aquacultural operations affecting the breeding and nursery grounds by direct destruction or by pollution, dam construction reducing fresh water inflows, etc. One of the more recent publications on this issue, the report of a national symposium on conservation and management of shrimp resources of the east coast of India (FFP, 2001) gives detailed statistics to show that unless urgent attention is given to taking measures for reduction in fishing pressure, things can only become worse.

Figure 4: Shrimp from capture sources in Thousands MT



For capture fishing industry, these fluctuations have meant increased risk, uncertainty and expenditure. The need to maximise returns on whatever is caught, is also a reason why more boat owners have begun focusing on the quality of the finfish catches. The improved quality, in turn, seems to have spurred a demand for some of the varieties – such as eels, ribbonfish – to be exported in frozen condition.

The other important export items from India, i.e., cephalopods, have never been a major item of capture in the state, contributing a paltry 24 MT in a total marine fish production of 150,000 MT in 1998-99 according to the DOF (2000), or 389 MT in a total of 166482 MT in 1999 according to MPEDA (2001:324)[6]. That the exports show a much higher quantity probably indicates the exports may have a different provenance, say, Orissa.

A more important item from the export point of view is the mud crab – *Scylla serrata.* Interestingly enough, it is very hard to quantify the production and export of mud crabs in the state due mainly to the fact that it is captured[7] in the artisanal sector and that too from the estuarine waters and it is almost entirely exported from Chennai. The DOF statistics are entirely silent on the mud crab production in the state, while those provided by MPEDA indicate that

[6] These differences in figures between the DOF statistics and the CMFRI/MPEDA statistics are something that cannot be easily explained in human terms, and should be taken to have divine origin and left at that.
[7] Mud crab is also cultured - 'fattened' – to a limited extent

there were no landings of crabs in the state in 1998 and 1999. Mud crabs are transported in live condition, packed in bamboo baskets, to Chennai for export to Southeast Asian countries (Malaysia and Singapore) (Raj, 1992). Raj (1992) estimated that, on average, about 500-750 kg of live mud crabs from Kakinada, another 300 kg from Nellore, Eluru and Repalle areas in Andhra Pradesh reached Chennai for export daily. In the period after these estimates were made, mud-crab fisheries saw a sudden spurt, with a large number of aquaculturists switching to mud crab culture, which may have increased the supply, but information on mud crab culture is so sketchy that it is very difficult to arrive at a picture of its status in the state now. The mud-crab culturists in East Godavari have indicated that non-availability of sufficient numbers of juveniles has been an important constraint restricting the expansion of the activity, and even its sustainability in the present form.

Inland fish

Inland fish production includes the produce from the rivers, reservoirs, tanks etc., besides that from culture sources, but not including the brackishwater varieties. The inland species landed consist mainly of different types of carp, murrels, barbus and prawns. The composition of prawns in the catches has gone up from 8,856 Mt in 1992-93 (or 6.5% of the total inland production (DOF, 1993: 27) to 23,475 MT in 1998-99, accounting for nearly 10% of the total production, and 18% in terms of value (DOF, 2000: 32), which is quite significant in view of the fact that the inland fish production itself increased by 72% during the period (DOF, 2000:31).

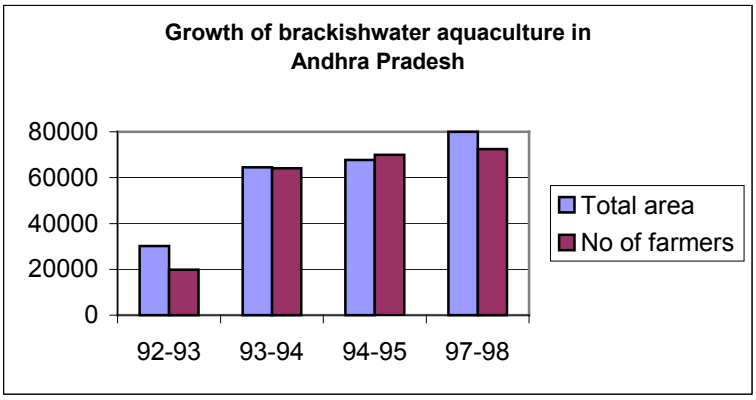
Brackishwater shrimp

Brackishwater aquaculture will need to be considered in any study dealing with trends in seafood export from Andhra Pradesh because it is inexorably linked into export markets. Although brackishwater aquaculture gained momentum only in the early 1990s, it has seen rapid changes in fortune beset as it has been by adverse litigation, local community resistance and, most serious of all, diseases. While it shows signs of recovering from the setbacks, it is reported that the worst is not over yet and even if it bounces back into profitable operations, it will never reach the dizzy heights that it did early on.

Aquaculture grew rapidly in Andhra Pradesh through the 1980s and '90s. Within the nine coastal districts there are some 150,000 ha of brackish water lands suitable for aquaculture (GOI, 1996: 139). BOBP (1983: 11) mentions that only a few individuals were involved in brackishwater aquaculture at the time. By 1998, according to the DOF (1998: 10, 12) nearly 80,000 hectares was developed for shrimp culture, which included land converted from agriculture (31,000 ha.) and mangroves (2,837 ha.). Figure 5 shows the growth of brackishwater aquaculture in Andhra Pradesh during 1992-93 to 1997-98 (DOF, 1993: 8; 1994:19; 1997: 13; 1998: 10)[8].

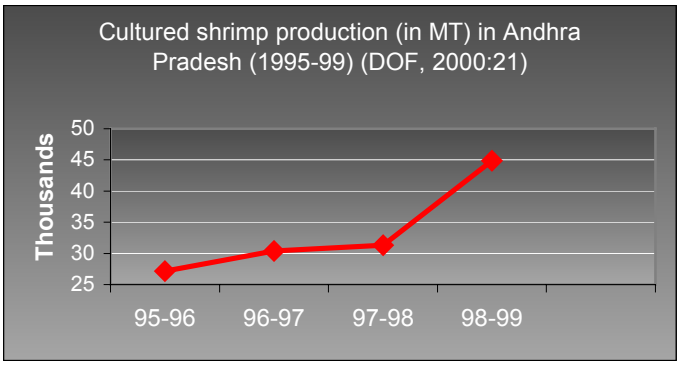
8 More recent figures tend to put the total area and the numbers of farmers at the same level as in 1997-98, perhaps because no census was taken or because showing an increase would show that brackishwater aquaculture is growing in spite of the need for farmers to obtain permission from Aquaculture Authority of India (AAI).

Figure 5: Growth of brackishwater aquaculture in Andhra Pradesh (by area and by number of farmers)



Shrimp belonging to *Penaeus monodon* and *P indicus* are cultured extensively in the state. The cultured shrimp production in Andhra Pradesh nearly doubled between 1995-96 and 1998-99 (DOF, 2000: 21). Of late, freshwater sources have begun to be used for shrimp farming purposes, and according to MPEDA (undated), some 16,600 ha of freshwater area was utilised for tiger shrimp farming during the year 2000-2001 (Figure 6).

Figure 6: Cultured shrimp production in Metric Tonnes in Andhra Pradesh (1995-99)



Adequate infrastructure has been developed in the state for culture of shrimp. Andhra Pradesh leads the country in terms of the number of shrimp hatcheries – out of a total 283 in the country, as many as 180 (or 60%) are located in Andhra Pradesh, accounting for 65% of the total production of post larvae (Sudarshan Swamy, 2001).

As Rajeev Raghavan (2001) notes, 'The giant freshwater prawn – *Macrobrachium rosenbergii* – is considered to be a candidate species for diversifying aquaculture in India due to its attributes favourable for culture including successful reproduction in captivity, established technique for larval rearing, good growth rate and survival, absence of major disease problems and also wide consumer acceptability and high market value'. The production of giant freshwater prawn (also called 'scampi' in Andhra Pradesh was to the tune of 4,410 MT (or 62% of the total production in the country) during 1999-2000, and 14,515 MT (or 88% of the total production in the country) during 2000-2001. Out of a total 35 scampi hatcheries, more than half, or 18, are located in Andhra Pradesh. The figures for export of freshwater prawn are not known.

Preservation and processing facilities in Andhra Pradesh

Infrastructure facilities in Andhra Pradesh have developed sufficiently well to cater to the export needs of the state. Visakhapatnam, East & West Godavari and Nellore districts, by virtue of being the centres of production and export in the state have well developed infrastructure facilities. In all, there are 55 processing plants registered with MPEDA in the state (see Annex IV), with sufficient capacities for freezing (total capacity 671.5 MT), IQF (total capacity 93.3 MT), blast freezing (total capacity 106.4 MT), together accounting for 871.2 MT per day. There are 96 cold storages with a total capacity of 7690 MT, and ice plants with a capacity of about 750 MT Per day (MPEDA, internal document) (Annexure 9). Obviously, the access to these facilities is determined by the location of a fish-landing centre to an urban centre, and it is possible that in many areas – Srikakulam and Vizianagaram districts in particular – such access is very limited.

Apart from the bare figures indicating the increased processing and preservation capacity, very little is known – or documented – about the relationship between capacity vis-à-vis production cycles. Sources of demand, linkages between the preservation systems and credit-marketing networks, and seasonal fluctuations in demand are not studied.

Be that as it may, there is no denying that the growth in the basic infrastructure in the state has been very rapid and is one of the key reasons for the exponential growth of exports from the state. Even as late as 1983, the BOBP was reporting that there was a total freezing capacity of 157.7 tonnes (less than a fifth of what it is today), 2560 MT of frozen storage capacity (less than a third), and ice production per day was 583 MT (only a third less than in 2001). It is also possible that, being concerned with exports alone, the available statistics do not take into account all the ice plants in the state. Field research indicates that there has been a rapid growth in ice plants in many villages, but this was mainly a result of increasing domestic demand both within the state as well as ex-state, and consequently, the export statistics do not necessarily take cognisance of their growth.

A Brief Review of Seafood Export Industry in Andhra Pradesh

The problem of quantifying seafood exports from Andhra Pradesh

The seafood exports from Andhra Pradesh are channelled through the ports of Visakhapatnam located in northern coastal Andhra Pradesh and Chennai in the neighbouring Tamil Nadu state. The recently constructed minor port at Kakinada began exporting fish around the middle of 2001, and is reportedly gearing up to handle significant quantities of fish from the current year.

While the exports from roughly about half the coastal areas (the northern belt, stretching from Srikakulam to parts of the Krishna district, and including Vizianagaram, Visakhapatnam, East- and West-Godavari districts) are channelled through Visakhapatnam Port (also known as Vizag), those from the southern belt – consisting of Guntur, Prakasam and Nellore districts, besides a part of Krishna district – are exported via Chennai Port. These demarcations are by no means watertight, with fish from the northern belt going to Chennai both for domestic and international markets. It is also not uncommon for cultured shrimp from the southern districts to be exported through Vizag Port. The problem of the origin of exports is compounded by the fact that Vizag Port also handles a large percentage of seafood exports from the neighbouring Orissa, whose only port – Paradeep – has not been handling seafood for a while now.

The Marine Products Export Development Authority (MPEDA) which has the responsibility of collecting and disseminating export statistics for seafood does not have a distinct category for Andhra Pradesh, and gives out port-wise information only. The result is that even the state Department of Fisheries in Andhra Pradesh, which draws its information from MPEDA, uses the export figures for Vizag alone as indicative of exports from the state. It is reported that the state government has requested MPEDA to start collating information for Andhra Pradesh state from this year onwards, and until such a practice becomes established, quantification of exports from the state will continue to remain an obstacle.

For anyone trying to detail the export flows of seafood from Andhra Pradesh, this will naturally mean confining the studies to Vizag alone, although even that is contentious because of the Orissa inflows. One way of overcoming this could be to use the available port-wise statistics of exports from Orissa and Tamil Nadu states and deduct those from the total exports from Vizag and Chennai Ports respectively to arrive at the net exports from Andhra Pradesh. However, a visit to Chennai to obtain information on the contribution of Tamil Nadu (and Andhra Pradesh) to total exports from Chennai Port from the MPEDA and the Department of Fisheries, has indicated that the MPEDA in Chennai confines itself to providing statistics for Madras Port alone (and not the state-wise contributions to exports), and the Department of Fisheries in Tamil Nadu takes credit for all the seafood exports from Madras.

What it means in practical terms is that in spite of much emphasis in policies about 'increasing exports for more foreign exchange earnings', and about the lead that the state of Andhra Pradesh has taken in increasing exports abroad, it does not appear that there are any figures to show how much of the seafood exported from the country is coming from Andhra Pradesh.

Even the deductions based on Orissa data need to be further validated, taking into consideration the species/commodity-wise break-up etc. The fact that MPEDA in Vizag does not have state-wise statistics for Orissa also made it difficult to crosscheck the information. Consequently, though this is an important area for consideration, it is touched upon only briefly in the next section.

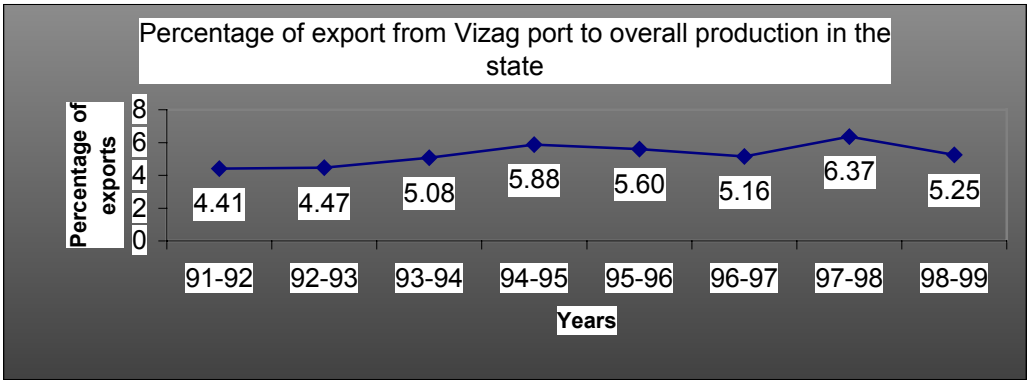
Percentage of exports to overall state production

Although exports have received the most attention in the fisheries development programmes, they constitute a very small percentage of the fish produced in the state (DOF, 1997 & 2001; MPEDA, 1995 & 2000) (*Figure 7*). Even as a percentage of the marine fish landings alone, they constitute less than 15 percent (Table 3).

Table 3: Percentage of exports from Andhra Pradesh to fish production in the state

	AP Production in Metric Tonnes (MT) (Marine & inland) (A)	Marine production in MT (B)	Export from Vizag in MT	Percentage of exports to (A)	Percentage of exports to (B)
91-92	238011	99135	10501	4.41	10.6
92-93	293330	141855	13114	4.47	9.25
93-94	321365	154320	16327	5.08	10.6
94-95	345387	150259	20315	5.88	13.5
95-96	355959	151990	19942	5.60	13
96-97	359359	152047	18544	5.16	12.2
97-98	372859	146545	23747	6.37	16.2
98-99	410829	150000	21572	5.25	14.4

Figure 7: Percentage of exports from Vizag Port to total fish production in Andhra Pradesh



It is possible that using the CMFRI figures for production, which are generally more conservative than the Department of Fisheries production statistics, would give a boost to the percentage of exports from the state, but it was not possible to obtain CMFRI figures for the

period under study, and it appears that MPEDA also seemingly settles for the state government figures in its handbooks of statistics.

As a percentage of marine and brackish water production together, the statistics for which are available only for 1995-96 to 1998-99 period, the percentage of exports is as follows (Table 4):

Table 4: Percentage of exports in marine and brackishwater production in Andhra Pradesh

	Marine and brackishwater production in MT	Export from Vizag in MT	Percentage of exports
1995-96	179128	19942	11
1996-97	182424	18544	10
1997-98	177865	23747	13
1998-99	194856	21572	11

In terms of value, however, exports appear to constitute a sizeable amount of earnings, but the available information is inadequate to arrive at any ascertainable figure. If the DOF's estimate (1997 & 2000) of the contribution of fisheries (which obviously includes both marine and inland sectors) to the state GDP is taken as a measure, it yields some, but by no means reliable idea (Table 5).

Table 5: Percentage contribution of fisheries and exports to the State GDP

	1993-94	1994-95	1995-96	1996-97
State GDP (in Rs. Crores)	53750	62412	71901	80744
Contribution of fisheries to the GDP (in Rs. Crores)	819	858	1019	1789
Percentage contribution of fisheries to GDP	1.52	1.37	1.42	2.22
Contribution of export of seafood from Vizag Port (in Rs. Crores) (MPEDA, various)	456	651	604	522
Percentage contribution of exports to fisheries	56	76	59	29

However, there are apparent anomalies in the way the contribution of fisheries to the state GDP is presented here. There is a possibility that the contribution of fisheries is being calculated based on the value of exports alone – which is probable, considering that Chennai Port handles sizeable quantities of captured and cultured varieties of seafood, and between them, Chennai and Vizag seem to be accounting for the entire contribution of fisheries to the GDP as presented in the Handbooks on fisheries statistics[9]. Clearly, there is a gap with respect to the information on the contribution of fisheries to the state economy, which has implications from a livelihoods perspective.

Net Andhra Pradesh exports from Vizag Port

The above quantifications are made based on the assumption that the entire quantity of exports from Vizag Port has its origin within Andhra Pradesh, which however is not true. As indicated a

[9] To confuse matters further, for 1998-99, the DOF Handbook gives a value of Rs. 677 crores for the marine landings (p.36), while suggesting that fishing contributed Rs. 272 crores to the state's GDP in the same year (P. 5).

sizeable proportion of exports from Vizag have their origin in Orissa, and will need to be deducted from the total exports from Vizag to arrive at a figure for those from Andhra Pradesh.

The following table (Table 6) attempts to disaggregate the quantity of seafood that had its origin in Andhra Pradesh from the overall exports from Vizag for the period 1991 to 1996 using available DOF-Orissa data for the period (DOF-Orissa 1996:73).

Table 6: Percentage share of seafood from Andhra Pradesh and Orissa exported through Vizag Port

Year	***Total exports from Vizag***		***Orissa's contribution (DOF -Orissa 1996)***		***Net Andhra Pradesh export from Vizag***		***% AP***	***% Orissa***
	Quantity in MT	*Value in Rs. '000*	*Quantity in MT*	*Value in Rs. '000*	*Quantity in MT*	*Value in Rs. '000*		
1991	9889.5	1857374	1851	325119	8038.5	1532255	81.28	18.72
1992	11692	2428615	2718	542410	8974	1886205	76.75	23.25
1993	14163	3563317	2527	616532	11636	2946785	82.16	17.84
1994	21491.5	7056965.75	4178	1163900	17313.5	5893065.75	80.56	19.44
1995	18836	5978124	4781	1255500	14055	4722624	74.62	25.38
1996	19340	5670721	7099	1743150	12241	3927571	63.29	36.71

These revised figures indicate that Andhra Pradesh's share in overall exports from Vizag Port ranges between 65 and 85 per cent of that reported, and the gradual increase in the exports from Orissa shows that Andhra Pradesh's share is shrinking. This, taken in conjunction with the fact that the percentage of exports to overall production in the state being very low, indicates that the importance attached to seafood exports from the state – particularly in terms of livelihoods generated or taken away – might be much higher than is necessary.

Going by the quantities exported from Vizag that have originated within Andhra Pradesh, it appears that only 3-4 percent of the total production from the state is being exported through Vizag. Even if Chennai is assumed to export an equal quantity of fish originating from Andhra Pradesh[10], the total percentage of exports may not exceed 6-8% of the total production in the state. This throws an interesting sidelight on the export-based fisheries economics that dominate all coastal states in India where a large proportion of the fisheries development projects and funds (see GOI, 1996) have been focused for nearly half a century in promoting seafood exports and export-based fishing practices, to the apparent detriment of everything and everyone else, only to account for a fraction of the total production from the state.

Exports from Vizag port

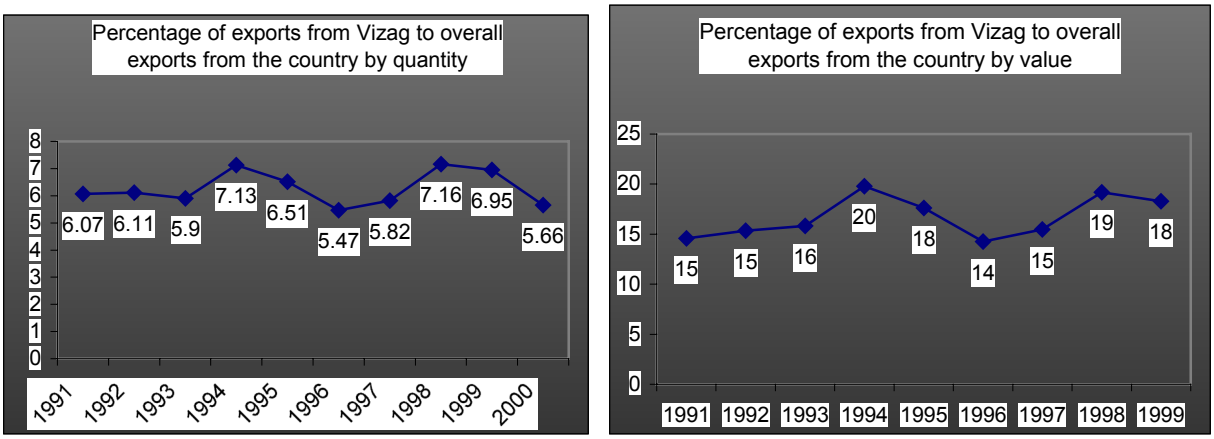
The east coast has traditionally exported low volume-high value products, i.e., mainly shrimp. In the year 2000, for instance, the total volume of exports from the east coast (95,520 MT) is less than a third of those from the west coast (325,555 MT), but in terms of value, the exports from the east coast were higher by more than 30% over those from the west coast (nearly 38000

[10] In 2000, Chennai exported a little over 34,000 Mt of seafood as against about 24,000 MT from Vizag (MPEDA, 2001).

million rupees as against 26000 million rupees on the west coast) (see also Nero Shahin & Asha Parameswaran, 2001). This holds good in case of Vizag also, as a comparison of the quantities exported from Vizag Port with their contribution to the overall export earnings will show. In the year 2000, the exports by quantity from Vizag Port amounted to about 5.6 percent of the total volume of exports from the country, but they fetched 18 percent of the total export earnings (MPEDA 1995 & 2000). Annexure 6 provides item-wise exports of seafood from Vizag port from 1996 to 2000.

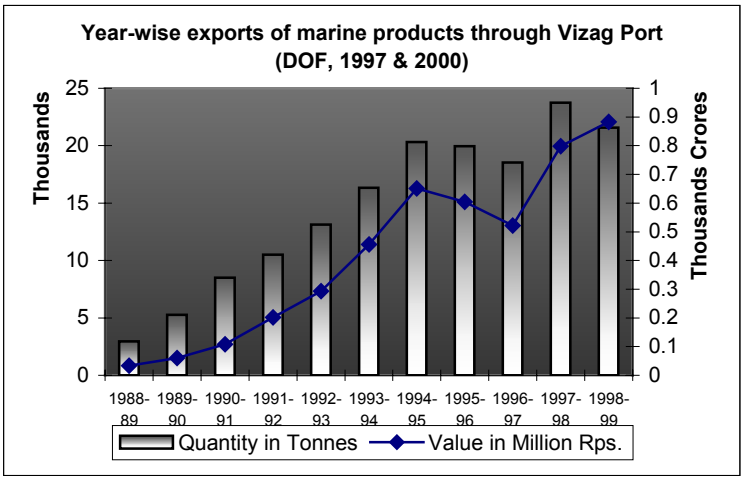
In Andhra Pradesh most fishing operations are geared to meeting demand from outside the state and there is a rapid increase in the export of fish from the state over the years. In 1997/98, 23,747 MT of marine products were exported to overseas markets from Andhra Pradesh. This was worth nearly Rs. 8,000 million (DOF, 1998: 39). In comparison, during 1989-90, the exports stood at 5,261 MT, valued at Rs. 600 million (DOF, 1994: 53). Some 12,347 MT of fish (valued at Rs 244 million), 682 MT of prawn (valued at Rs 106 million) were exported to other states (DOF, 2000: 51) (Figure 8).

Figure 8: Percentage of exports by quantity and by value from Vizag Port during 1991-99



During the period 1991-1998, the total volume of exports from Visakhapatnam had gone up by more than 200% from 9,889 Mt to 23,746 Mt, while the value went up more than four times from 1857 million rupees to 8000 million (MPEDA, 1995:298 & DOF, 1998: 41). Growth of exports from Visakhapatnam Port during 1988-98 (MPEDA, cited by various DOF Handbooks on Fisheries) is given in the following figure (Figure 9).

Figure 9: Year-wise exports of marine products through Vizag Port



However, the quantum of exports from Vizag port has remained more or less static since 1997, while it is the value of the exports that has been going up and keeping the industry in profit, as the following table (Table 7) (from MPEDA, 2000) shows:

Table 7: Exports from Vizag Port by quantity and value during 1996-2000

Exports from Vizag	Quantity in tonnes	Value in Rs. '000
1996	19340	5670721
1997	23238	7215370
1998	22445	9027780
1999	22744	8698230
2000	23825	9802650

Thus, between 1996 and 1997, the quantity of exports has risen by 23 percent, and has shown a declining trend in the next two years, reaching the 1997 level only in 2000, while the value of the products has shown a constant increase (by nearly 72 percent) between 1996 and 2000. The increase in value is mainly attributed to the rapid rise in international prices for shrimp, which however are reported to have stabilised (or even declined in some cases) during 2001, particularly in the post-September 11 period.

The drop in the exports from Vizag Port for the year 1996-97 is, for once, explicable because a number of things coincided during that period bringing the exports down. The foremost factor responsible for the drop was the white-spot disease that laid to waste a large number of aquaculture farms. Secondly, the adverse Supreme Court judgement brought down aquaculture activity in the coastal areas. Thirdly, but only marginally, the EU ban might have reduced the exports as well.

Country-wise exports of Marine Products through Vizag port

Annexure 7 provides item-wise and country-wise exports of seafood from Vizag Port for the years 2000 and 2001. Japan has constituted the largest importer of seafood from Vizag Port, both in terms of volume and value. Although there has been a decline in percentage terms in the

exports to Japan, in real terms, there has been more than a doubling of the quantities and a seven-fold increase in value of exports between 1990-91 and 1998-99.

Europe accounted for about 5% of the total exports from Vizag Port and the decade of 1990s saw a decline in the percentage of exports to Europe, and in real terms, the growth of exports has been comparatively sluggish. For instance, exports to the US during the same period have expanded five-fold in terms of quantity and 17-fold in terms of value. In this background, it is no surprise that apart from the direct exporters to the EU, very few people in the industry are aware of the EU ban and its impact on the seafood industry. Annexure 8 provides a list of processing plants in Andhra Pradesh that have been approved for export to the EU.

It has been countries like China, Malaysia, UAE, Thailand and Australia, which became important importers of seafood from Vizag Port over the period, growing spectacularly and cornering a much larger share of imports – more or less equal to the imports by the US and the EU put together (Table 8; Figures 10 & 11). It is also important to note that exports to these countries have included, besides traditional varieties like shrimp, many fish varieties including ribbonfish, seer, pomfret, croakers, snappers etc, thereby opening doors to a large number of hitherto-local varieties in the international markets.

Table 8: Country-wise share of exports by volume and value from Vizag Port in 1990-91 and 1998-99

	1990-91 (DOF, 1993)		1998-99 (DOF, 2000)	
	By Volume (MT)	**By Value (Rs. Crores)**	**By Volume (MT)**	**By Value (Rs. Crores)**
Japan	7554	100	16105	766
USA	407	3	2011	51
Europe	465	5	672	14.3
Others	83.5	0.5	2783	50.8

Figure 10: Country-wise exports by quantity and value in 1990-91 from Vizag Port

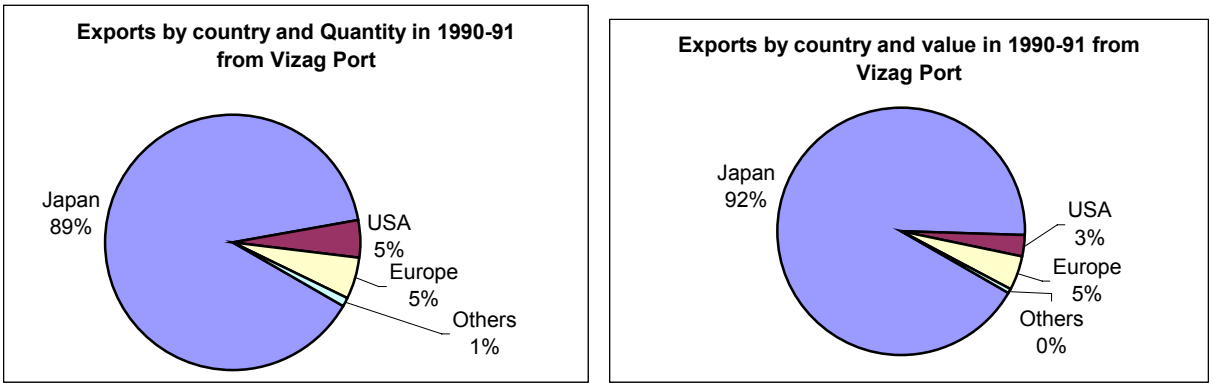
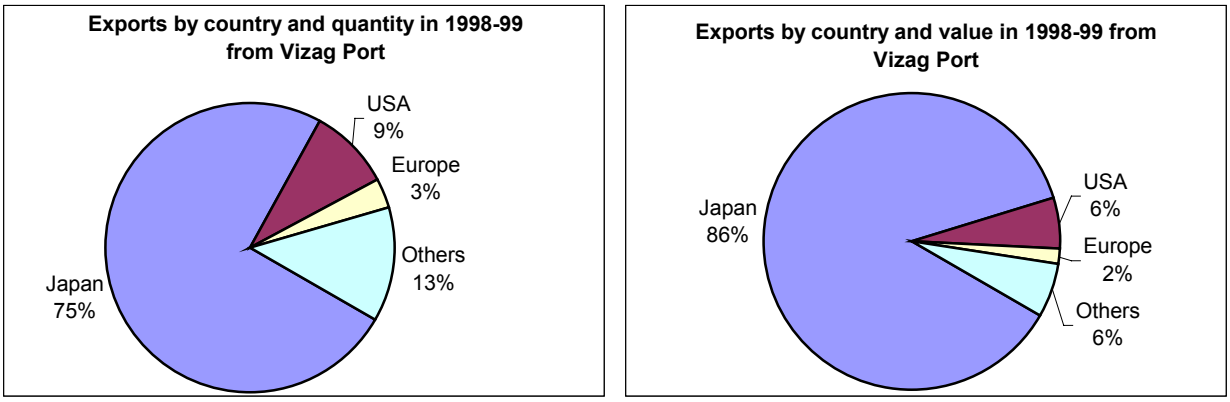


Figure 11: Country-wise exports by quantity and value in 1998-99 from Vizag Port



However, that EU accounts for a small share of exports does not make it unimportant from the exporters' point of view. They argued that, contrary to the statistics presented above, while the quantities exported to the EU are low, the returns are quite good and lucrative and also doing business with EU importers is a far more dependable source of work than elsewhere. The fact of the EU ban bringing some changes in the seafood legislation in the country in its wake has been said to be a good thing because, once the necessary certification has been obtained, it opens new possibilities of export to Europe than previously. Also EU represents a highly diverse demand for different seafood products, for instance, the Mediterranean countries show preference for products that are very different from those demanded by the Northern European countries. Also, EU countries in general ask for different seafood products, as opposed to a relatively smaller range of products demanded by Japan and US. This factor has been discussed in more detail in the section on seafood legislation.

The exports to China and Southeast Asia, on the other hand, are subject to fluctuations because of their own domestic production activities, which could bring the procurement prices to very low levels at times, and even at the best of times, the margins are not quite as lucrative as when sold to EU or the US directly. Another advantage with the EU markets is that, once the necessary certification has been obtained, the exporter can choose to send to any country within the EU, so the *potential* for doing business with EU is far greater than is being done at the moment.

Percentage of fish to shrimp in overall exports from Vizag Port

Andhra Pradesh reportedly supplies nearly half the total quantity of shrimp exported from India (The Hindu, 17 April 2002). Much of the shrimp of *Penaeus* spp that is produced in the state is exported (MPEDA, 1995: 2a). This is purchased by processing and packaging plants then exported directly or through specific exporters. The main markets are USA, Japan, West Europe, Middle East and South East Asia (MPEDA, 1985: 2a). In 1991, more than 97% of the total exports from Vizag consisted of frozen shrimp. By 2000, the composition of shrimp (including cultured shrimp) by weight in the total exports came down to less than 80%, although, in terms of value, shrimp still constitutes 96 percent of the export earnings (Table 9).

Table 9: Contribution of shrimp exports from Vizag by quantity and value in 1991 and 2000

	By Quantity	By Value
Percentage of shrimp to total exports from Vizag Port in 1991 (MPEDA, 1995)	97.7	99
Percentage of shrimp to total exports from Vizag Port in 2000 (MPEDA, 2000)	79.4	96

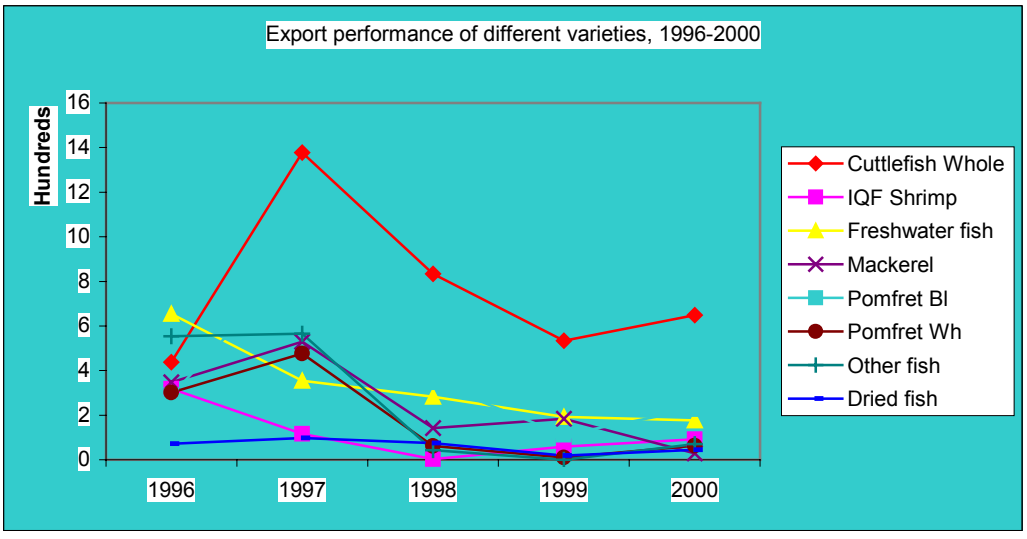
Inconsistent performance of the 'traditional' and 'new entrant' varieties of fish in the exports

While the overall exports have been showing signs of increase over the years both in terms of volume as well value, an analysis of the trends of export for individual varieties/commodities of seafood indicates that the year-wise exports of most varieties are characterised by inconsistency, and often by declining contribution to exports. Traditional export varieties such as squid, lobsters, cuttlefish and even shrimp (block-frozen and IQF varieties) have shown declines in real terms, and it is the increase in value that keeps some of them going.

The producers and exporters interviewed during the research indicated the following reasons for the uncertain performance of different fish species in exports: (i) low catches, (ii) inconsistent landings, (iii) uncertainties in seasonality, (iv) uncertain demand, (v) fluctuations in international demand, (vi) poor returns, (vii) poor production and post-harvest systems, (viii) poor timing of landings vis-à-vis demand, (ix) too many intermediaries, and (x) high costs of investment etc.

This dichotomy of more fish entering into the export market on the one hand, while showing signs of decline and inconsistency on the other is one of the interesting features of the export sector in the state (Figure 12). It is possible that the signs of exhaustion that are perceptible in the capture sector have begun to make their presence felt in the export sector, and hence will need to be considered carefully while making any future projections.

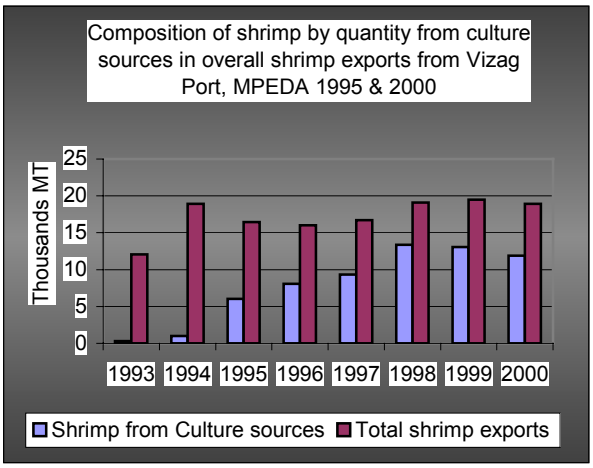
Figure 12: Export performance of different species between 1996 and 2000

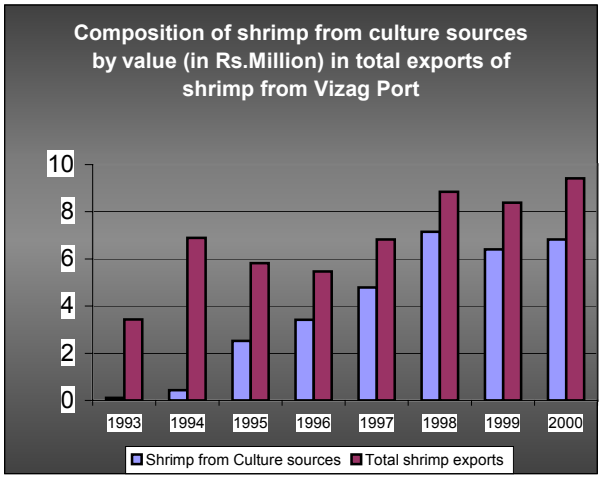


Capture vs. Culture shrimp in exports from Vizag:

Export of cultured shrimp from Vizag Port began in 1993, when a total of 294 MT, valued at Rs. 11.5 million, were exported, in a total of over 12000 MT of shrimp exported at a value of over Rs. 367 million. By 2000, the quantity of cultured shrimp exported exceeded that of the capture shrimp with a total of nearly 12000 MT in a total of about 19000 MT. Value-wise the cultured shrimp fetched nearly Rs. 700 million from the total shrimp export earnings of 940 million (Figure 13). This is borne out in interviews with the processor-exporter representatives, who calculated that about 85% of their exports of shrimp come from capture sources. In value terms, however, the marine capture shrimp has a much higher value – almost 50 percent more – than the cultured shrimp of the same variety and size-count.

Figure 13: Contribution of culture shrimp to overall shrimp exports by volume and value





Contribution of small-scale sector to overall exports:

From the available export statistics – either from MPEDA or from the Department of Fisheries – it is not possible to calculate what percentage of the exports from Vizag Port come from small-scale (artisanal) sector. Considering that most – or all – of the *Penaeid* shrimp produced in the state is intended for export, the production by the small-scale sector of this variety in comparison with that produced in the mechanised sector has been taken as an indicator of the contribution of the small-scale fisheries to exports of shrimp (Department of Fisheries, 2000) (Table 10).

Table 10: Contribution of mechanised and non-mechanised sectors to shrimp landings

Year	Mechanised landings (in MT) (Percentages in brackets)	Non-mechanised landings in MT (Percentages in brackets)	Total production of *Penaeid* shrimps in the capture sector
1994-95	3337 (52)	3029 (48)	6366
1995-96	3216 (38)	5269 (62)	8485
1996-97	3407 (42)	4611 (58)	8018
1997-98	3612 (49)	3780 (51)	7392
1998-99	5629 (49)	5774 (51)	11403

This table throws up yet another interesting observation: that the non-mechanised, i.e., artisanal, small-scale, sector actually contributes *more than the mechanised sector* to the overall landings (and consequently to the exports) of penaeid shrimp. However, Sudhakara Rao & Varma (2001), using CMFRI statistics, suggest that the contribution of non-mechanised boats to the total shrimp landings declined from 24.9 percent in 1980 to 9.4 percent in 1997, so this matter needs more information to draw any conclusions.

Efforts to link the production of penaeid shrimp in the capture and culture sectors to exports has been attempted but the lack of information on exports from Chennai and the non-specific description of the shrimp exports in the available statistics makes it difficult to draw any conclusions.

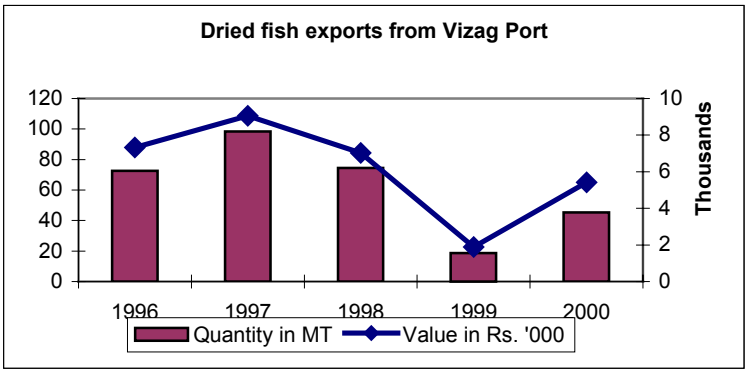
Whatever the statistics might say, one clear indication that the artisanal shrimp catches must be dwindling comes from the fact that the processing companies do not prefer any more to extend loans to the commission agents in the capture sector. There is a decrease in the amount of money given as advance, as well as the numbers of fishers who could take such advances over the years.

Going by the available statistics, thus it appears that only a very small percentage – about 10-12% - of the total marine and brackishwater production is exported from Vizag Port, of which about 80% is constituted by shrimp. More than two-thirds of the shrimp exports are accounted for by production from culture sector, and of the remaining, artisanal sector accounts for more than half, if you believe the Department of Fisheries, or about a fifth, if you go by CMFRI figures, thus leaving us with the impression that the contribution of the mechanised fishing sector to shrimp exports, as a percentage of total marine and brackishwater production in the state is about 1 to 2 percent. That shrimp is already an overexploited species in the coastal waters of Andhra Pradesh indicates that the relative contribution of the mechanised sector can only decline further.

Dried fish

Export of dried fish from Vizag Port began in 1995, but they started showing a decline from 1997 onwards (Figure 15). Poor quality, supply sources in the unorganised sector and inconsistent supplies have been cited as reasons for the poor performance of the dried fish in the export markets. Product from states like Gujarat far exceeds those from Andhra Pradesh both in terms of quantity and quality, and obviously has an edge over the Andhra Pradesh product. The international market itself is reported to be increasingly in favour of frozen products anyway.

Figure 14: Dried fish exports from Vizag Port, 1996-2000



Export channels for the important varieties of seafood in Andhra Pradesh

There are mainly two export channels for seafood from Andhra Pradesh: Vizag and Chennai Ports. However, many fish species also take alternate routes of export and consequently, not only do they escape being considered as 'export' items, but also make it difficult to track their routes. Pomfrets, for instance, are mostly transported to Mumbai by trucks, from where they are exported abroad. A large proportion of dried ribbonfish reportedly reaches Bangladesh via Orissa and Bihar, and often clandestinely, which makes it very difficult to map the routes they take. Chilled ribbonfish are reportedly exported to the UAE and other countries in that region by air from Delhi. Many of the dried fish from Andhra Pradesh get exported via Mangalore and Veraval, and the reverse is also equally true – i.e., fish from Gujarat and Karnataka travel via Andhra Pradesh to Southeast Asian countries. Seerfish has a good local market in Chennai, and a large quantity of seer landed in Andhra Pradesh and Orissa reach Chennai by train, but it is also possible that a part of this is being exported. Live crabs from Andhra Pradesh are generally exported through Chennai Port. A part of the freshwater fish sold in Calcutta from Andhra Pradesh invariably finds its way into Bangladesh, but this export to Bangladesh remains completely shadowy and hence unquantified.

What all this means is that to try and map the route that an export variety takes is not a straightforward procedure at all, even at one particular location. The same species could take different channels at different times, and determining what route it takes on a given day is dependent on so many local, national and international factors that the decision could sometimes look completely arbitrary and unpremeditated. The fact of numerous intermediaries at every level of transaction also makes it difficult to understand the dynamics of operations.

In the context of Andhra Pradesh, to understand the export channels for various seafood items, the following commodities/species have been studied because they were most important in terms of value as well as volume in exports:

1. Black Tiger shrimp – from mechanised sector in an urban area
2. Black Tiger shrimp – from artisanal/motorised sector in a rural area
3. Black Tiger shrimp & Scampi – from the culture sector
4. Seer fish & Pomfret – from an urban/rural landing centre
5. Ribbon fish – from mechanised sector in an urban area

Although a large number of other varieties have been mapped out as well, at a generic level, the above listed fish species seem to account for most of the permutations that seafood exports take in the state; hence the study was confined to these varieties alone.

Figure 15: Stages in the export of black tiger shrimp (Capture/Mechanised sector/Urban landing centre)

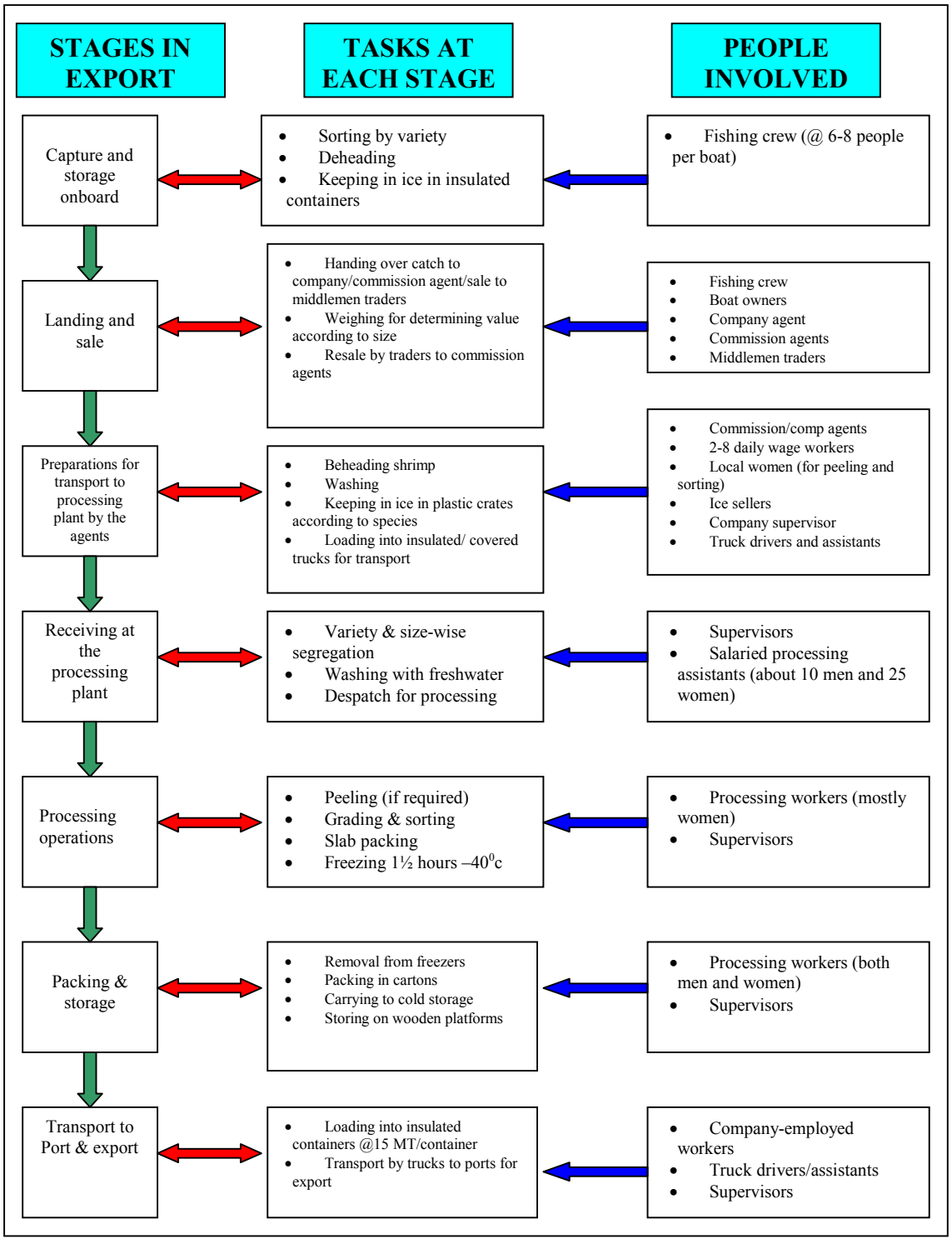


Figure 16: Stages in the export of black tiger shrimp/scampi (Culture)

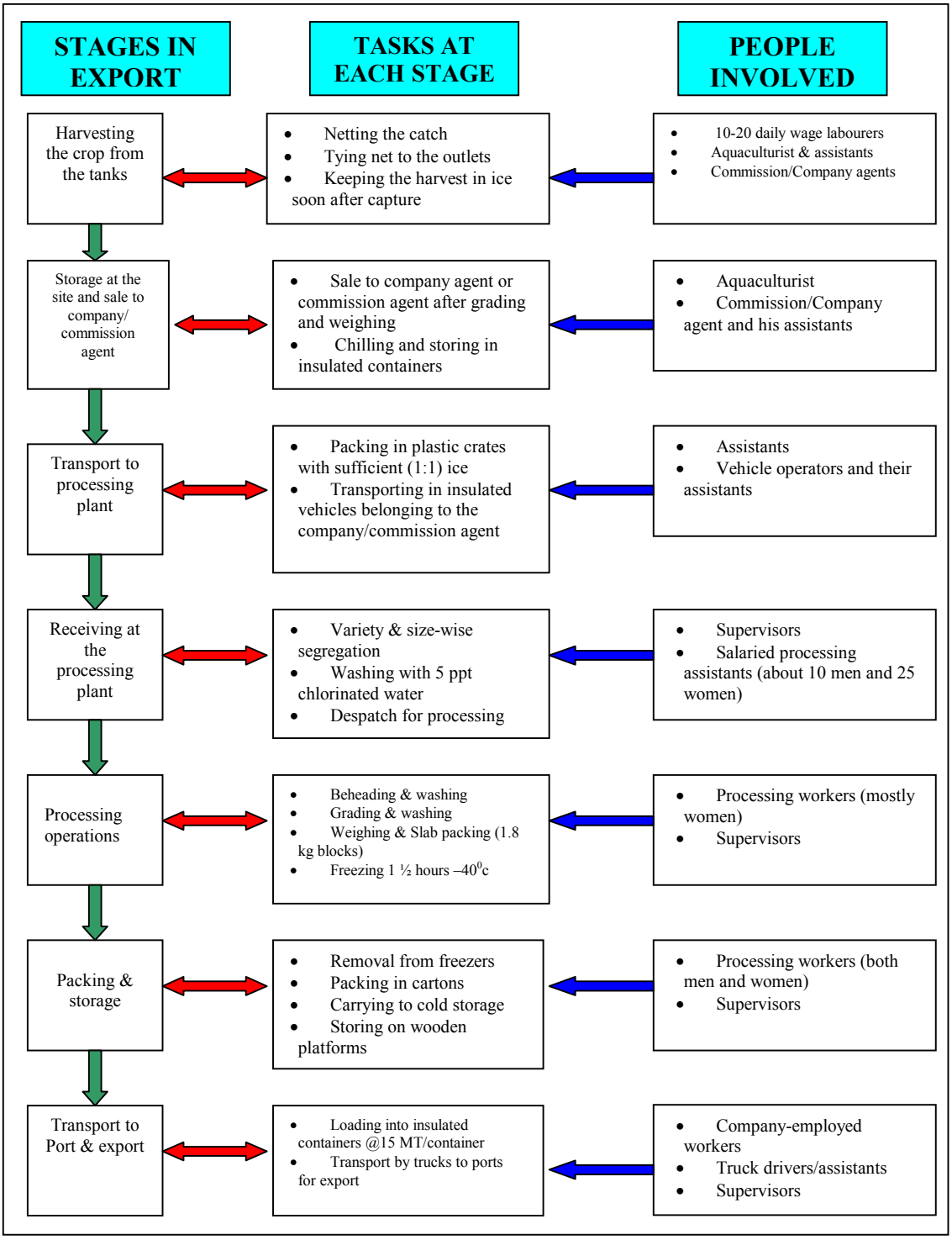


Figure 17: Stages in the export of black tiger shrimp (Capture/Artisanal sector/Rural landing centre - Uppada):

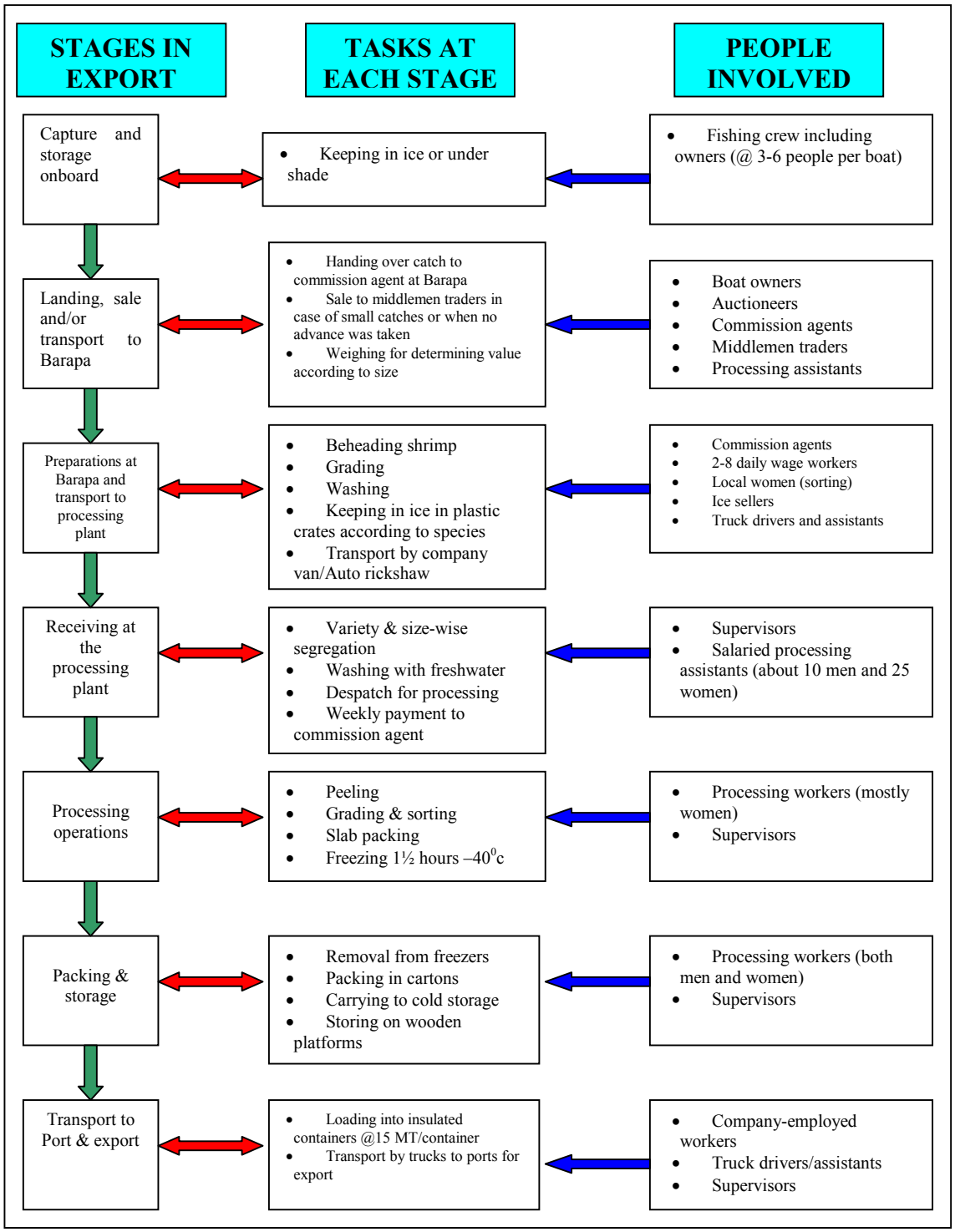


Figure 18: Stages in the export of high quality fish (Seer, pomfrets)(Capture/ Artisanal/ Urban - Kakinada)

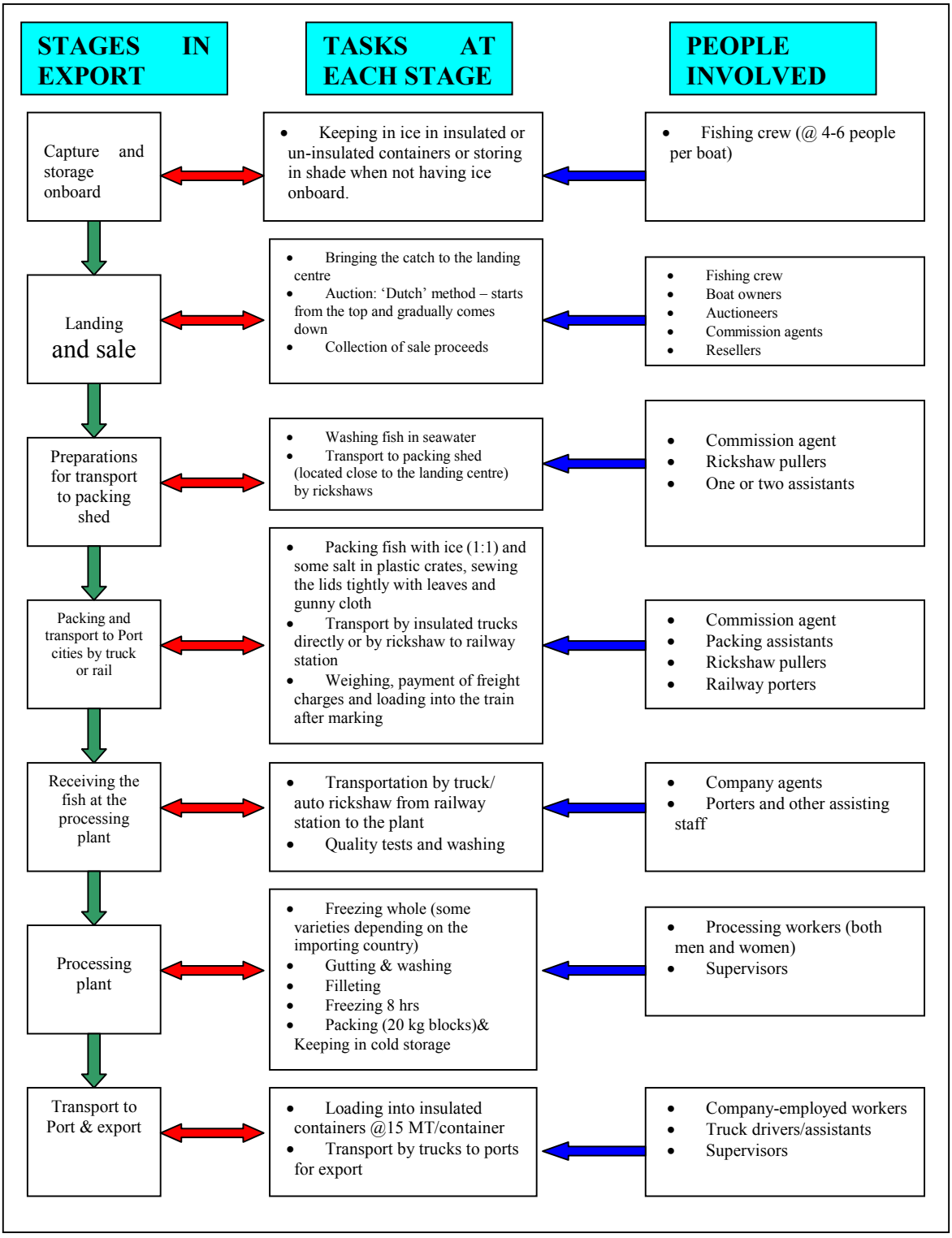
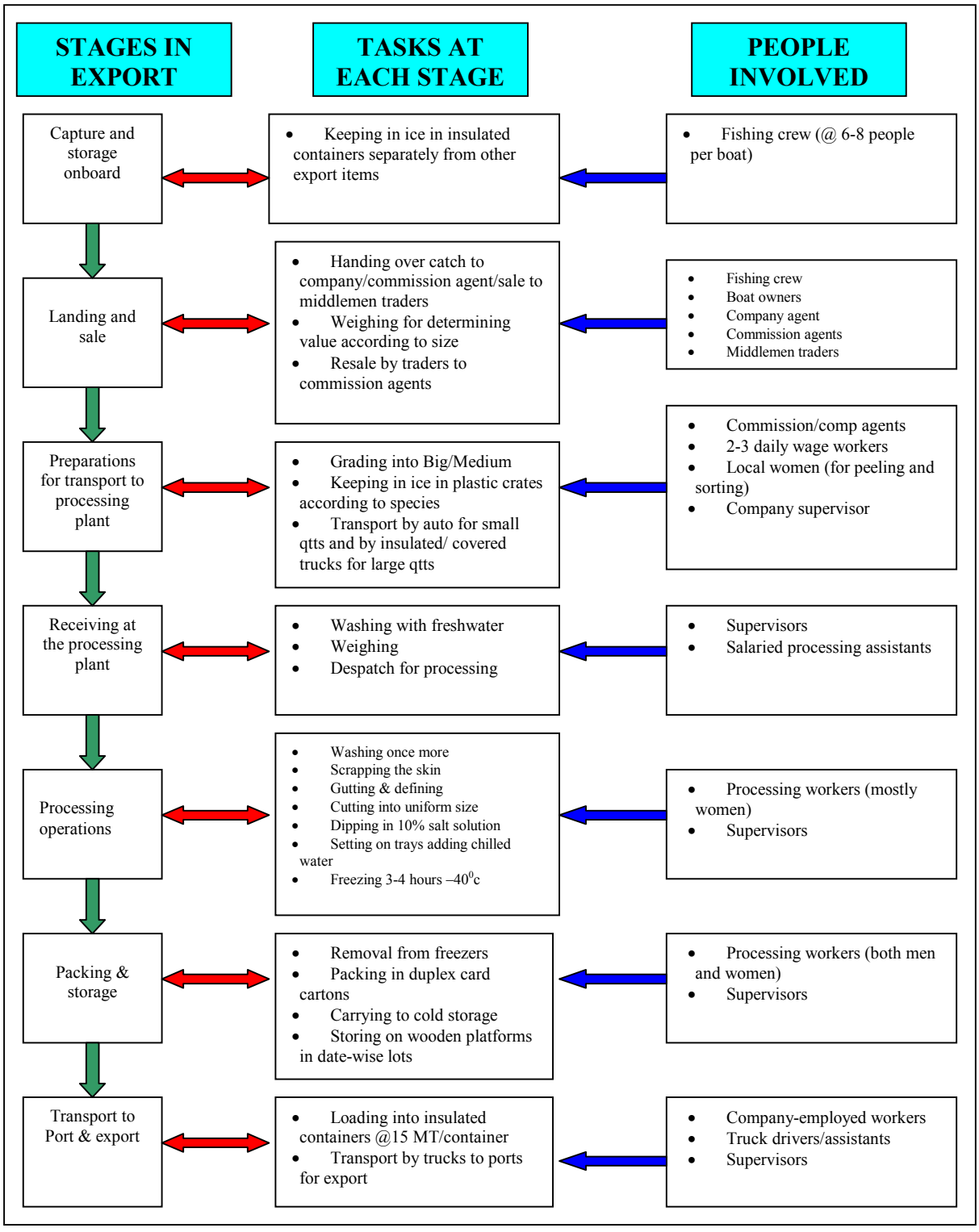


Figure 19: Stages in the export of ribbonfish (Capture/ Mechanised/ Urban - Vizag)



Notes on Shrimp export channels from Andhra Pradesh

Both capture and culture shrimp follow the same channel once they reach the processing plant, but obviously differences exist in the manner of their procurement and also in the players involved.

Brief description of different shrimp products exported from Andhra Pradesh

The processing and freezing of shrimp vary with consumer and market preferences as well as with the variety of shrimp. MPEDA (1993) & ICSF (1995) give a list of export shrimp products.

1. Whole prawns – the shrimp are graded according to size, washed and packed in cartons for export.
2. Headless with shell on – only the heads are removed while the shell is kept intact. Beheading is important to reduce spoilage, as the head contains enzymes that hasten spoilage. Grades indicate the number of pieces per kilogram/pound (8-12, 11-15, 16-20, 21-25, 26-30, 31-35, 36-40, 41-50, 51-60, 61-70, 71-90, 91-110). They are packed in two kg duplex cartons containing polythene sheets. Ten such cartons make one master case of 20 kg.
3. Fantail round – head portion and shell are removed except on the last segment, so the tail is left intact.
4. Fantail deveined – processing as with fantail round, but alimentary canal is removed. The removal of alimentary canal reduces the rate of spoilage because it contains enzymes and undigested food material that have an effect on quality.
5. Butterfly – processing as with fantail deveined, but the meat is split open from the dorsal side and arranged in the required pattern
6. Raw peeled or peeled un-deveined (PUD) – small varieties are converted to PUD. Head, shell and tail are removed completely, but the alimentary canal is left intact. Grades are 60-80, 80-120, 100-200, and 300-500, packed as in the case of headless with shell on.
7. Peeled and deveined (PD) – processed along the lines of PUD, but the alimentary canal is removed. Grades are 130-200, 200-300, and 300-500. They are packed in 5 lb cartons and 10 such cartons make one master case of 50 lbs.
8. Cooked products – cooked and peeled, peeled and cooked, peeled, deveined and cooked and whole cooked, the process adopted depending on the agreement between the processor and buyer. The market for cooked products is very low (ICSF, 1995).
9. Individually Quick Frozen (IQF) – these products fetch a better price in the international markets than the conventional block-frozen materials. High quality raw materials should be used in IQF and processing done under very hygienic conditions. The products are packed in moisture-proof packaging and stored at or below 23oC, without fluctuation in storage temperature. Thermofoam mould trays have now become accepted packing containers for IQF products in developed countries.

Activities involved in the export of shrimp from capture sources

Almost all mechanised boat owners receive 'advances' ranging from Rs. 50,000 to Rs. 200,000 from commission agents (who in turn receive advances from the processing plants) in return for assured supply of their shrimp catches to particular processing and exports units. A tiny fraction

of the owners tend to remain independent for whatever reasons. In Vizag, some of the boat owners have come together to form a syndicate into which they contribute 10% of their earnings from each trip. These savings are mainly used as a revolving fund for insurance needs and possibly for working capital needs also. Those who do not take an advance from the processing plants tend to receive a higher price than those who take advances. In addition to advances, most boats also obtain ice free of cost from the processing plant with which they have an arrangement, although this appears to be changing rapidly to an arrangement where the company deducts the cost of ice from the final payment, or even charge for the ice at the time of sale itself.

In the case of the artisanal/motorised boat operators, the amount of advance varies with the boat, location and season, but most boats that catch good quantities of shrimp and high value fish do have access to 'advances'. However, processing companies do not directly deal with the artisanal sector generally and commission agents play an important role in these transactions. The owner in turn pays advances ranging between Rs. 3 – 5 thousand per crewmember to retain them on his vessel through the year. This does not carry any interest, but the crewmember will have to pay the money back if he wants to shift to another boat.

On landing, the shrimp are disposed off in one of two ways: all those owners who have an agreement with a company/commission agent (who represents the processing plant at the landing centre) hand over the catch to the employees of the company/commission agent. The company agent differs from the commission agent in that the former is a salaried employee of the company, while the latter is paid a commission based on the business he does for the company. Companies have their own agents at important landing centres such as Kakinada, while rural and remote landing centres are serviced through commission agents. Conversely, shrimp could be sold to a third party when (i) the boat owner does not have an obligation to sell his catch to particular agents or (ii) his company agent fails to turn up at the landing centre for any reason. In this case, the fish are sold to 'middlemen-traders' who sell them in turn to another commission agent for a profit. In many cases, this does not involve the middlemen putting any investment at all – they pay only after selling the shrimp to another agent, after pocketing their share.

In the mechanised sector, shrimp are weighed, sorted and packed with the least amount of delay. The prices paid for shrimp are dependent on the prevailing international price, quality and quantity of the product and the amount of advance taken by the boat owner. After handing over the catch, the boat owners receive a voucher for the value of the shrimp they have sold (if sold directly to a company agent), which they can encash from the company offices in the town. For their immediate needs, some amount of money is paid at the landing centre itself. In Vizag, payments are made on taking delivery of the shrimp at the harbour itself. The mechanised boat owners associations regularly display the procurement prices for different varieties of shrimp on a blackboard.

In case of the artisanal sector, shrimp are carried to the commission agent's or the independent trader's place ('Barapa') directly by the fishermen, where the catches are weighed before icing. The commission agent pays a portion of the money owed to the fisherman immediately, but the final payment is generally made at the end of the week on a stipulated day when he receives his money from the company in the town. The commission agent receives 10% as his commission. The competition amongst the commission agents for shrimp ensures that they retain only 10% of

what the company pays them and pass the rest to the fishers – otherwise, the fishers could easily change agents. Independent traders, on the contrary, pay the fishermen immediately or as soon as they sell their shrimp to a bigger trader or to the company directly. The payments in case of the independent traders are thus more prompt – both from the trader to the fisherman and from the company to the trader. When the sale is made through middlemen, obviously the boat owner receives a lower price than if sold directly to the company. Obviously, in villages where the commission agent or an independent trader has a monopoly of procurement, or when the villages are located far away from the processing areas, the prices the traders pay are more arbitrary.

The cost of ice is borne by the fishermen themselves for carrying onboard. While the wide network of commission agents in most coastal areas has the apparent benefit of enabling the fishers to sell their catches immediately on landing at the best possible prices and also in terms of giving them access to credit for various needs, the arrangements often hide a range of hidden costs. For instance, the fishers in BCV Palem receive about 15% less on the selling price of their shrimp when sold in the nearby main village of Tallarevu, although Kakinada, where the processing/collection facilities exist is hardly 20 km away. Naturally, this leads to the fishers showing preference to land their catches mostly in urban landing centres, whenever good catches of shrimp and high value fish are caught.

In a sense, the increasing reluctance of the companies and the commission agents to extend advances to the artisanal fishers has been of positive value in that the fishers are free to sell their catches anywhere they liked for the best returns. On the other hand, it does mean that the fishers who depended on the cash advances for meeting their working capital requirements are badly affected, with the result that in some villages like BCV Palem, fishers are increasingly turning to other occupations, such as aquaculture labourers. Over course of time, it has been observed that the fishers tend to operate from the urban landing centre itself, which gives them good access not only to markets, but also to fuel, ice and other requirements. The impact of such concentration of landings has been widely recognised to have far reaching consequences in terms of availability of fish in the villages for consumption and petty trade. The commission agents also form cartels and ensure that the fishermen cannot hope to get more than the same price elsewhere in that area.

In Vizag, shrimp are carted off to the processing plant without any pre-processing, because most processing plants are located within short distances from the landing centres (although beheading is resorted to onboard the trawlers fishing for long durations at sea), where as in rural areas, beheading and peeling may need to be carried out in the village itself because of the distances and times involved in transporting the shrimp to a processing plant. The cost of the transaction from procurement at the landing centre till the consignment reaches the processing plant reportedly works out to Rs. 70 per kg, and this includes wages paid to the labourers employed in peeling, beheading, packing in ice, and head loading, and the cost of ice and transport.

There is an increasing reluctance on the part of the companies to allow the fishers to do the beheading and peeling operations. Until recently, the fishermen had the responsibility of beheading the shrimp before selling it to the agents and traders. This however has changed and the traders insist on buying the whole shrimp, and it is said that two reasons were responsible for the shift. One, it is possible to ascertain the quality of the shrimp from visual observation only when the head is intact, and two, more importantly, the practice of keeping shrimp in ice or

chilled water (the insulation being inadequate in most iceboxes used in the sector, much of the ice would have melted inside the boxes before a fishing trip was over), particularly without head will allow incursion of water inside the body adding to weight and loss of flavour also. Whilst this helps the fishers in earning more for their shrimp catches, it means a loss for the processing company, which loses both ways in that the shelf life of the shrimp soaked in water is reportedly very low. A third reason, cited by a Kakinada-based shrimp peeler, was that the Cochin-based processing plants, which source their shrimp from Kakinada area, have discovered that the Kerala girls employed in their plants are more adept at removing heads without losing meat in the process. The difference in losses due to inexperienced beheading was apparently quite significant, and the factories decided to buy whole shrimp from Kakinada. There was no ascertainable relation between the changes in the pre-processing operations and the EU or national seafood legislation.

Although the EU legislation requires integration of the peeling and pre-processing operations with the freezing plants, it is not a viable option for India, reportedly due to the factory laws (Tarakan, 1998). The erratic seafood catch also encourages employment of the labour for peeling and pre-processing operations on weight basis, and it is difficult to maintain such a large labour force at 15% capacity utilisation, as the fixed costs would render the units uneconomical in no time.

Insulated vehicles have been the distinguishing feature of the shrimp export chain. Although they had been in use prior to 1990, it is only during the 1990s that their numbers grew so prolifically that besides shrimp, much else has come to be transported by them, and as pointed out by some of the traders in Kakinada, it is probable that the growth in the export of non-shrimp varieties was a direct result of the increased capacity to transport fish over long distances in good conditions. Most of the insulated and covered vehicles are owned by the exporting/processing companies, and in places where the commission agents or middlemen-traders take on the responsibility of transport to the processing plant of shrimp etc., they tend to hire covered (generally non-insulated) vehicles for the purpose. The insulated vehicles carry shrimp long distances – often all the way from Kakinada to Cochin, a distance of nearly 2,000 km – for processing purposes. Extreme care is taken while transporting shrimp – particularly the final product being sent to the port – and it is always moved during night times in order to keep the temperature as low as possible.

All processing plants also double as exporters, but many exporters hire the services of an existing processing plant for processing their product on a temporary basis, a practice that leads to many problems. The processing plant here has no control on the quality of the product brought into the factory, or after it has been taken out. To the extent that the exporter sells it as his product, there is no potential damage to the processing plant, but there are reports indicating that the processing plants some times allow people without the certification to export using their own certification, obviously in return for a fee. In this instance, the factory will obviously held responsible should anything be found wrong with the consignment on inspection in the importing country, but inability to find adequate quantities of shrimp to process throughout the year reportedly forces some processing plants to resort to such ploys to earn their maintenance costs.

But two factors have been cited to be effective deterrents to this trend in the long run. For one thing, the Inter Departmental Panel and the Special Accounting Team – which have the responsibility of recommending the issue of clearance for export to the EU – also fix the quantity of shrimp that a processing factory could process in a day, based upon the infrastructure and equipment available in the factory. Should the factory lend its certification to other factories for exporting *their* product, it would be easy for the inspecting agencies to see that the quantity that a factory exported was clearly more than its capacity during a particular period (the final packed product also bears the date of processing). Secondly, with the punitive measures that the factory attracts in case of its consignments failing at any stage will act as a deterrent. It is expected that this will soon be a thing of the past, although it still continues for the time being.

Activities involved in the export of shrimp from culture sources

Instead of a boat owner and his crew, in this case, it will be the aquaculturist and his assistants who will be responsible for bringing the harvest out of the pond. The aquaculturist arranges with a company or a commission agent for lifting the catch immediately after the harvest and then only sets to harvesting. He employs about 10-20 people depending on the size of the ponds and the time of the day when harvesting begins. These will generally be people from the neighbouring village though bringing people all the way from a distant town, in order not to give the 'locals' an entry point into the pond premises, is not uncommon – the local people are considered to be hostile and thieving, and if allowed to get into the farm once, could be a potential threat in future. In most areas, large farm owners tend to remain aloof from the neighbouring villages and depend on the distant towns for meeting even their basic needs. This however is not valid when the owners come from the local community itself.

Be that as it may, the people involved in harvesting are often professional fishers who take up pond harvesting only as a subsidiary activity. In some areas, sea- and creek-fishing people have ceased fishing operations altogether and have begun working in aquaculture farms as wage earners. In places like Krishna district, where aquaculture has remained more or less a small-scale activity, most communities divided up the village commons amongst all members who gave up fishing altogether and became full-time aquaculturists. It is said that harvesting was done as a communal activity to begin with – one aquaculturist helping another – but the disease-related problems made aquaculture a difficult proposition for most villagers, whose capacity to invest large sums of money into every crop was limited.

Once the harvesting is done, shrimp are weighed and their value estimated, after which they are kept chilled inside insulated iceboxes waiting for the trucks to come and take them to the processing plant. Once the transaction reaches this stage, the responsibility of the farm owner ceases and it will be the company/commission agent who will take responsibility for the next stages. Commission agents are more prevalent in transactions involving small aqua-farmers. The commission agents arrange for simultaneous harvesting by a number of small farmers on the same day so that it becomes viable for the company to send a vehicle with ice etc.

Often, most aqua-farmers receive loans in kind and rarely in cash from the processing factory, which supplies seed, feed, fertilisers etc., to the farmer in return for selling his crop to the company. Most processing industries in the aquaculture belt have an interest in shrimp

hatcheries, feed and fertilizer supply agencies etc. At the time of sale of the harvest, the company deducts its investment and pays the rest to the farmer. Shrimp seed for stocking purposes is generally given free of cost to the farmers.

Shrimp seed collection thrived as a full-time livelihood activity through the 1990s, with many fishers in the coastal villages withdrawing from the increasingly uncertain capture fishing operations to concentrate on seed capture. The arrival of shrimp hatcheries on the scene, the practice of the processing units providing shrimp seed free of cost and most importantly, the government regulations banning shrimp seed collection have all curtailed seed collection activities to a large extent. Shrimp seed collection continues in many places, but on a much smaller scale than previously.

Quality maintenance and control

The widely prevalent notion about the slack quality maintenance and control measures in Indian seafood processing industries is a matter that needs closer attention. When, during the research, people in the various intermediate stages – traders, commission agents etc – were asked whether there had been a change in emphasis on buying better quality products in the post-EU ban period, the answer invariably was that quality had *always* been given a priority when procuring shrimp, and that if a shrimp showed even slight traces of being not good in quality or discoloured or was not right in anyway, it would be automatically rejected. This filtering mechanism works at different levels – the fishers onboard would grade their catch according to quality (which includes colour, disfiguration, breakage and other parameters) because the existence of a single poor quality shrimp could sometimes be taken to mean that the whole catch is somehow not good and the payment would be a fraction of what it would otherwise fetch. The collection agents washed the shrimp before counting and segregating them, and were extra careful to remove the poorer quality specimens because any mistake on their part would mean that they would have to pay for any rejects at the subsequent stage. At the processing factory, once again, there is a grading according to quality. In all these cases, the poorer quality is not thrown away or rejected, but is paid only a small price. This would mostly go for domestic markets, or in cases, when the importer is not very particular, exported as second-grade product to some countries.

Thus, both the producers and the intermediaries in the transactions are quite clear that any quality-related problems would have come during post-processing stages or while the consignment is being shipped to the importing country. The processing industry people too agreed that the current systems of loading mean much time delays and improper handling while loading and unloading and that the use of reefer containers that is gaining ground increasingly could reduce these problems to a significant extent. In this background, it is not surprising that neither the producers nor the collection agents have been asked to improve the quality of their supplies in the post- EU ban period.

The use of ice and insulated ice containers onboard as well as on shore has been going on for at least two decades in Andhra Pradesh, particularly in the mechanised sector and this seems to have made an emphatic difference to the mechanised boat operators, considering that no boat ever ventures into the sea without ice. During the 1990s, most artisanal fishing systems targeting shrimp have acquired insulated iceboxes or fish-holds for keeping shrimp immediately after

catching; fishing systems such as traditional non-motorised catamarans carry some makeshift mechanism for keeping ice from melting for as long as possible and generally return to the shore before it melts completely. Knowing that shrimp is a valuable commodity, it is in everyone's best interest to deliver it to the next link in the chain in as fresh a condition as possible and expeditiously.

Until early 1990s, shrimp were packed in bamboo baskets for transport to the processing plants, but, over time, plastic crates have been taking their place. The crates are sturdy, can be stacked one above the other without crushing the shrimp, easy for quantification purposes, reusable and are relatively inexpensive. It is reported that the basket weaving community, whose livelihood depended on purchase of the baskets by the fishing industry, has been affected adversely, but this being a general phenomenon concerning not just the export sector, the perceived impact on the basket weavers could be assumed to have its origin in a deeper malaise.

Basket weavers in Uppada

Basket weaving is a traditional occupation for a particular caste of people in coastal areas. The basket weavers of Uppada use toddy palm leaves for making baskets, which are mostly used by the fishers for many purposes – such as for storing fish and shrimp onboard, for carrying them to the landing centre or to the buyers' place, for packing salted and dried fish, etc. It was for particularly packing the dried and salted fish that the baskets were the best adapted. Thus, whenever there is a slack in fishing operations, the basket weavers also feel the impact.

Over time, as ice and plastic containers began to be used for storing and carrying fish both onboard as well as after landing, the demand for the palm-leaf baskets has come down. As more fish began to be exported in ice, there was no need to use baskets. Moreover, the flexible palm baskets were found to be inadequate for packing shrimp with ice, because when baskets were stacked over one another, the shrimp tended to get crushed. The plastic crates were more easy to procure, lasted long, did not cost very much, were of a uniform size to suit the processors' and exporters' needs, could be used for stacking one over the other, and, with limited insulation, could keep the shrimp longer in chilled condition.

On the other hand, as more fish began to be iced and sent to distant places, the quantity of fish that went into traditional processing – salting and drying – has come down. This too has meant a decline in the demand for the baskets.

Nowadays, most basket weavers also have alternate occupations – selling curry-leaves, working in agricultural fields, pulling rickshaws, etc.

On the export front, Vizag has been upgraded into a container port, and this has reduced losses due to spoilage, cut transaction costs and berthing times and improved the quality of the product significantly. It is said that the processing factories often take on lease reefer containers for exporting shrimp abroad.

Although there are reports that many processing plants were either demolished or closed down as a result of changing seafood legislation, the link between the two appears tenuous, although the

demand for following HACCP systems by the USFDA, and the support provided by the GOI through MPEDA have been mentioned by some industry sources as one reason for the upgradation. The closure of plants has to do with poor supply, while the demolition took place only in case of the old processing plants, which are too difficult to upgrade to more efficient practices without making some radical changes to them.

The most important reason for the closure of the processing plants appears to be under-utilisation. It is reported that processing plants in the country are operating at 15 percent of their installed capacity, which makes the activity very uneconomical, particularly for low investment operators who manage the operations on the basis of quick cycle times. Some processing plants have been leased out to bigger exporting companies in Vizag and Kakinada. Many processing plants have also been closed down – the five processing plants near fishing harbour in Vizag have been reportedly closed down due to years of mounting losses.

Pricing and Margins of Trade

Information on the market share of different companies is difficult to ascertain, considering the wide variations that exist between companies in terms of their source of supplies, products exported, countries exported to, ports utilised for export etc., and no secondary data could be procured on the relative stakes of different companies in the export chains in the state. There are three or four major processing/exporting companies in Vizag, but their relative shares vis-à-vis overall exports – in terms of quantity and value – are not ascertainable.

Similarly, information on price developments is not easily traceable, and this has to do with the fact that prices fluctuate all the time anyway, and are determined according to species, count and quality. Seasonality does play a minor role in deciding the prices – during certain periods of good supply (as at the time of aquaculture harvesting, or good shrimp fishing season), but considering the demand comes from abroad, the more important fluctuations in shrimp prices are those that have their origin in the international markets than in the domestic supply situation. Apart from broad generalisations about the margins that each successive stage in the export chain keeps for itself before passing on the product, it is not possible – and often not known – how the prices change from one stage to the other.

The first few steps – from the producer to the company agent, with or without the mediation of the middlemen-traders, are ascertainable to a degree, but the company agents themselves know at what price they can buy shrimp but not the price at which it will be sold in the international market. The processing, packing, storage and transport costs vary from place to place and from company to company, and thus, even if the going international market price is known from MPEDA and other sources, it will not be possible to work out the margins to the company.

Generally, shrimp caught in the estuarine waters and produced in the culture sector receive a lesser price than those caught in open-sea fishing. For instance, on a particular day in July 2002, tiger shrimp (41-50 count) landed by mechanised boats in Kakinada fetched Rs. 480 per kg, while the same in Tallarevu (a shrimp collection centre about 20 km from Kakinada, which procures shrimp from culture and estuarine capture sources) fetched Rs. 310. The differences in price are cited to be for three reasons: one, the estuarine and culture shrimp are darker in colour,

as opposed to the brilliant colours of the marine catch; two, the estuarine shrimp were of a poorer texture, i.e., softer and more delicate; and thirdly, the estuarine shrimp (not the cultured ones) were often not of uniform size – the marine shrimp, the fishers contended, were more uniform in size. For all practical purposes, the marine capture shrimp are in a separate class of their own.

Field research has indicated that a price differential of about 10 percent from one stage to the other – from the company agent downwards to the producer – is a valid assumption. Obviously, this is a broad generalisation, which does not take into consideration the 'exploitative' mechanisms – payment of advances for supply of shrimp at a fixed or a discounted price – that prevail in the relationships between traders and the fishers, but in bigger and better-connected villages at least, it is reasonable to assume that the 'market logic' works in favour of the fishers in obtaining a reasonable price for their shrimp.

The difference in prices paid to a mechanised boat owner in a large scale landing centre like Kakinada (with no intermediate links between the producer and the company), a non-motorised boat owner in BCV Palem (one intermediate link in between the producer and the company – the commission agent) and a motorised boat owner in Uppada (with two intermediate links – one independent trader and one commission agent) bears out this tiered system of payments – although the fact of taking an advance (commission agents) or not (independent traders) also plays a role in determining the margins to the various people.

Price differentials at different landing centres in East Godavari for shrimp:

There are different sources of shrimp in East Godavari district, all of which are brought to Kakinada, the district headquarters and the main fishing centre:

The main source of shrimp from capture sources is the landings by the mechanised fishing fleet based at Kakinada. In the northern parts of the district, shrimp are caught by artisanal boats, mainly catamarans, from the near shore waters of the open sea. In the southern parts, shrimp are primarily caught from the backwaters, creeks, river mouths – in other words, from estuarine waters. East Godavari is one of the most important shrimp farming areas in the country, and shrimp from culture sources is also channelled through Kakinada.

Data are collected for a particular day in July 2002 at selected fish landing and procurement centres in the district for tiger shrimp of the same size count (41-50 count), and of the same variety (i.e., head-on). The differences at various levels are indicative of the complexity that characterises the trade. As can be seen, the margins from one location to the other for the fishers are just small enough to make it feasible for them to sell their produce locally except when they catch very good quantities of shrimp.

Category	**Price received for 1 kg of tiger shrimp (41-50 count) in Indian Rupees**
Kakinada: (Marine/Mechanised)	
Fishermen	460
Commission agent	500
Independent trader	500

Uppada (20 KM north of Kakinada): (Marine/Artisanal)	
Fishermen	400
Commission agent/Independent trader	430
Large trader (sells in Kakinada)	500
Kakinada: (Estuarine capture and culture)	
Fishermen	300
Commission agent	310
Independent trader	320
Uppalanka (6 KM south of Kakinada): (Estuarine – capture & culture)	
Fishermen	270
Commission agent (sells in Kakinada)	310
BCV Palem (18 KM south of Kakinada): (Estuarine – capture & culture)	
Fishermen	260
Commission agent (sells to company agent in Tallarevu)	270

Amongst the producers, a fisherman who sells in open auction or to a trader directly because he is under no obligation to sell to anybody in particular can hope to get a better price than a fisherman who has taken an advance from the commission agent or the trader. The figures given above are for transactions involving no credit linkage. The difference in payment received by a fisherman with a credit arrangement could be as high as 30 percent in a village like BCV Palem.

There are a few other factors that play a role in determining the margins in the trade: the perishability of shrimp stipulates that factors such as the distance to the village, the access that the fishers and the local traders have to ice and transport systems, the time of landing, the minimum duration of storage of shrimp in the village before it can be carted off by the company, and the total quantity of shrimp that can be produced in a village on average (obviously, the larger the quantity, the better the opportunity for realising a good price), have all a role to play in determining the risk that a producer or a trader will be taking and consequently the margins that he hopes to make out of the transactions. In most cases, having an onshore ice storage system (such as a large icebox), even though it is never used, has meant that the fishers could bargain for, and obtain, a better price, but the concept of an onshore ice-cum-fish storage mechanism has not gone beyond the experimental stages.

The margins in trade are also reported to be masked under a range of questionable practices by the buyers – such as short weighing, gross deductions for 'possible' spoilage, etc. Company-owned processing plants are however said to be more scrupulous. This means that, although the apparent difference in payment received by different stakeholders is minimum, the actual difference could be higher.

Trends in shrimp supply

The seafood export sector has seen many changes over the last decade, but shrimp continues to remain at the top as the most important item of export. Shrimp catches from the marine sources started showing decline by late 1980s, and it was to complement the flagging catches from the sea that brackishwater aquaculture had been given much support. The problems that aquaculture faced subsequently meant that the pressure on the marine catches remained as strong as ever. While there has been no significant increase in numbers of mechanised boats, it has been seen that wherever good catches are sighted, a large number of trawlers congregate in the same area. With declining catches, the mesh sizes too have become smaller and this has implications for the survival of not only shrimp but a variety of other species as well. The exports for the current year appear to have fallen by about 10%, with the shortfall coming from the capture sector (JVH Dixitulu, pers.comm.). The deep sea trawling sector, which is entirely based in Vizag and concentrates on shrimp in the offshore waters of northern Bay of Bengal, is in deep trouble, their numbers having come down from nearly 200 a few years ago to less than 60, with hardly 20-25 of them operational anymore. The mini-trawlers (16-Mt category) too have more or less wound up operations, and it is only the 14-Mt, 'Sona' category that survives, albeit with a percentage of their income coming from non-shrimp categories of their catches.

The marine capture sector also faces a serious problem of over-capitalisation, so much so that even slight fluctuations in the international prices of shrimp have an immediate impact on their operations. When the price of shrimp came down to a little under Rs. 200 a kg, it was still substantial and expensive by Indian domestic standards, but it was way below the money spent on the fishing operations by the mechanised sector and thus was taken to be a serious setback.

As previously discussed, brackishwater aquaculture encountered a range of serious problems from adverse litigation and popular protests to disease problems and pollution. What was expected to supplement the flagging catches from the capture sector has now been fighting for survival, and it is still not clear how the sector can survive. Many shrimp farmers have changed to culturing *Macrobrachium rosenbergii*, the giant freshwater prawn, but it is not as lucrative as the tiger shrimp, and there are still many questions about its ability to substitute for tiger shrimp, the important one being their relative value. Differential growth rate is another cause of concern in freshwater prawn culture.

During field visits to Nellore district, it was observed that apart from three or four companies, almost all companies had withdrawn from the culture sector. The farms seemed deserted and the prospects for revival in these farms appeared to be very uncertain. The plight of small-scale aquaculturists in Krishna district, where nearly 55 percent of the small-scale farmers in the state are located, owning an equal proportion of the total aquaculture land in that category, has already been mentioned. The condition of the aquaculturists elsewhere is no better.

Besides the white spot[11] disease, popular discontent, litigations in court, allegations of violating the Coastal Regulation Zone Act provisions continue to dog the aquaculture industry. The issue

[11] White Spot Virus (Systemic Ectodermal and Mesodermal Baculo-Virus – SEMBV; also called White Spot Syndrome Virus - WSSV) was first described from Japan in 1993,(ADB/NACA, 1998). China, India, Indonesia, Malaysia, Philippines and Thailand have been among the other countries where the virus made serious damage to

of the use of antibiotics in aquaculture has received much attention recently, particularly as it has resulted in the EU placing Indian seafood on its watch-list, with a possibility of a ban if antibiotics continue to be traced in Indian seafood. It is reasonable to assume that the problems facing the aquaculture industry will continue to haunt it for some time yet.

What all this means is that the export-based industries are facing serious problems that have little to do with seafood legislation as such. This is going to be an important area of concern in the future, particularly in the light of the fact that no alternative species has yet been found to reduce pressure on the shrimp. Alternative fishing methods may have to be developed to diversify the operations of the mechanised boats, alternative species will need to be cultivated in the aquaculture farms and all this will need to be done fairly quickly.

Trends in shrimp export

The most important concern with respect to shrimp export from the state has been the wild fluctuations in the marine catches. On the other hand, international markets for shrimp remained sluggish through the year 2001, a supposedly good fishing year for shrimp. Beachside prices came down to about Rs. 150 a kg during August-September, from about Rs. 500 in May-June period, forcing the fishers to stop fishing altogether for more than a month. They picked up once again in 2002, but the trauma of the experience has made the boat owners extra cautious.

Shahin & Parameswaran (2001) indicate that there has been a diversification in terms of the products exported, covering canned shrimp, several items in frozen form such as headless and head on shrimp, PUD and PD, and several value-added products such as peeled tail-on shrimp, peeled tail-on stretched, butterfly tail-on shrimp, blanched/boiled peeled shrimp, breaded round shrimp etc., but it is not known what the percentage of the individual varieties is to overall exports. Many processing plants send their product in the conventional frozen forms such as headless, PUD and PD varieties, and to let the importers to do the value-addition.

It has been reported that much of the seafood – particularly shrimp – exported from Vizag to Japan and southeast Asian countries is reprocessed, and packed for re-export to the US and the EU countries as the product of the intermediate countries. While the processing plants are aware of the advantages of doing the value-addition themselves and directly sending the product to the EU and the US (as described above), they indicated that the additional investment involved was a burden. Secondly, to maintain quality through the various stages of value-addition may be difficult with the infrastructural facilities available for processing as well as for export in the country, and the exporters primary concern all along is to send off the product as soon as possible. A third reason is that the intermediate countries are known to be more reliable customers, and for the processors who prefer short cycle times to higher margins, this is a good reason for preferring the intermediate countries. Yet another reason is the fact that different countries have preferences for different value-added items (see MPEDA 2001: 11), and this

the shrimp aquaculture industry. The virus affects all ages of shrimp and within a few days the mortality could rapidly reach up to 100% (Sudarshan Swamy, 2001). It has been reported to have affected the natural brood stock in the sea and a number of marine crustaceans (Karunasagar & Karunasagar, 2001), indicating that the problem is likely to intensify. The damage it has done to shrimp aquaculture in India has been discussed at length in various issues of Fishing Chimes, Seafood Export Journal etc.

means that by trying to develop particular value-added products, the processors would be restricting their markets to a few countries only, whereas sending the conventional frozen shrimp is acceptable all over the world.

While this is so, there is also a growing interest in exporting value-added items abroad. Efforts have begun to produce more value-added items – particularly IQF and consumer pack products – by the bigger export companies in Andhra Pradesh although their contribution to overall exports remains very low. Once a factory is upgraded to the level of EU standards, it is said that manufacturing value-added items is not a very expensive proposition, and might even be to the advantage of the company in the short term as well as the long term. As will be discussed in the next section, most companies are looking to the west for widening their market base, and increasing their product range is obviously one of the more important adaptations they are interested to make.

Notes on High Quality Fish Export Channels from Andhra Pradesh

Much of the high quality fish in the exports – seer, pomfrets (both black and white) and snappers – are caught mainly by the artisanal motorised and non-motorised boats. The crew on these boats generally fall into the 'poor' category, and often the owners of the boats tend to be fishermen onboard as well.

Few of the artisanal boats carry onboard ice storage systems. Many make do with a makeshift insulated container made up of galvanised iron or wood. Many boats of FRP construction have inbuilt iceboxes able to carry up to 50-150 kg of ice/fish. Even those boats that do not have onboard iceboxes tend to carry ice – stored in the shade with paddy husk to cover it from direct exposure – in small buckets etc.

The high quality export varieties are caught mainly with large- and medium-mesh gillnets, and the time of capture varies from place to place, but generally night fishing is preferred. Two or, rarely, three hauls are made in one trip, thus catches tend to remain onboard for considerable periods after capture.

On landing, fish are simply put on the beach and a professional auctioneer performs the auction. Dutch auction is followed in most landing centres, in which the price begins at the highest level and comes down gradually. The buyers for high quality fish are large urban traders or their agents, commission agents for processing plants (who are confined to a few areas only), and some local traders as well. The commission agents receive a 10% commission on their purchases and often employ local women and men for participating in the auctions. It is increasingly the case that the commission agents pay an advance to the fishers – particularly for export items such as shark fins – in return for an assured supply, the amount advanced ranging between Rs. 10,000 to Rs. 30,000/-. When a boat that had obtained advance from a trader lands sharks, the fins are cut off immediately on landing and the carcasses are only sold in the open auction. Similarly airbladders are removed from eels upon landing, and the rest of the fish is sold in open auction.

The traders dealing in shark fins and airbladders employ women to process the fins and the airbladders to the required dryness before sending them off by baskets to Chennai for onward export.

The buyer has to pay the value of the fish almost immediately after the auction is over, and then gets the fish carried by rickshaws, if large quantities, or by head loads if the quantities are low, to the processing shed which is generally located in the same premises or within the same neighbourhood.

At the processing shed, the fish are packed in plastic crates, with layers of ice in between fish at a ratio of 1:1. When some of the fish show signs of being soft or semi-spoiled, salt is sprinkled on the fish while packing – it is said that the salt tightens the texture of the fish by extracting water. The plastic crates are sealed at the top with leaves of various kind and gunnysack.

Many processing factories tend to keep their own vehicles waiting at the landing centres when they know good catches are in the offing. These trucks will immediately be loaded with fish and transported to the processing factories elsewhere. When catches are particularly good, these trucks roam up and down the coast visiting fishing villages picking up the fish that the agents belonging to the company will have procured and kept in ice.

Alternatively, where rail connections are good and more convenient, or when catches are too low to make transport by truck viable, the commission agents send the packed crates to the railway station by rickshaw and book them for transport by train that same day. Generally, the fish will reach their final in-country destination within 24 hours of landing, and the quantity of ice kept in the crates is generally sufficient to keep them in good condition for the entire duration.

Trends in finfish supply

When it comes to the exports of finfish, it has to be understood that there is a traditional dependence on many of the specific varieties in the domestic markets, and a large number of people do make a living out of them, which could mean that their interests and concerns would need to be considered when considering an increase finfish exports. There are indeed a large number of finfish species that are at present poorly or un-utilised, large quantities of fish still go for poultry feed, and there is both a need as well as scope for taking advantage of their export potential, but this will need considering all implications, because these fish could also be the source of food to some of the poorer segments of population.

With increased emphasis on export of finfish, the treatment given to the once-cheaper varieties like ribbonfish and croakers onboard and after landing has undergone a shift. The decreasing percentage of shrimp in the overall catches has meant that the owners needed to maximise their returns from the other varieties in the catch, for instance, the transformation of ribbonfish into a 'quality' fish (albeit still low-value) has been nothing short of miraculous in some fishing ports like Vizag and Kakinada.

Whilst there has been an increase both in quantity and percentage contribution of the fish in the overall exports, questions still remain as to their consistency in terms of availability and quality.

Moreover, the status of the finfish catches is no better either when compared to shrimp. There are wide fluctuations in the quantities, sizes, seasonality and availability of various fish including seer, pomfrets and other exportable varieties. Traders who dealt exclusively with certain varieties like pomfrets have either stopped operations completely or send only one or two consignments in a year, preferring instead to diversify into other businesses.

Notes on Other Fisheries Exports from the State

Freshwater fish

Andhra Pradesh is a leading producer of freshwater fish – primarily carps – a large percentage of which is produced for ex-state and export markets. It has been reported that prior to the Gulf War in early 1990s, freshwater fish from Andhra Pradesh commanded a good price in the Middle-east markets, particularly amongst the large immigrant community from India. However, their share in the export markets came down by mid-1990s because the local demand itself grew rapidly. The international prices did not exceed the local market prices, and there has also been an increased competition for the same markets from countries like Bangladesh, Thailand and Burma. The price of freshwater fish in the international markets reportedly fell from $1.90 in 1992 to $0.90 by 2001[12]. Currently, it is reported, about one container of freshwater fish is exported every two months from Vizag Port.

Surimi

Surimi was being produced in the only plant located on the east coast of India in Visakhapatnam, and the plant had seen considerable ups and downs, before the decision to close it down was taken towards mid-2002, and the travails of this industry adequately reflect the difficulties faced by any capital-intensive enterprise based on capture fisheries. The surimi plant, set up as a 100 percent export-oriented joint venture between India and South Korea, faced problems right at the beginning with the economic slowdown in Southeast Asia, particularly S Korea. Subsequently, it changed hands and came to be owned by M/s. Hindustan Lever Limited, which owns four surimi plants on the west coast of India, and when it tried to operate the Vizag plant using raw material procured from the local fishing harbour, it became apparent that:

(i) being newcomers, they were forced to pay more than the going market rate for the fish,
(ii) the quality of the fish they were interested in was quite poor by the time it was landed, and
(iii) there was no consistency with quality or quantity and the problem was exaggerated by uncertain nature of fish catches, which are often mixed.

To overcome these problems, the management had been forced to resort to procuring their raw material all the way from the west coast of India, and as is to be expected, the cost of transport often exceeded the cost of production itself, and ultimately made the activity commercially non-viable.

[12] Information obtained from M/s. Navayuga Seafood Exporters, Vizag, reportedly the only company continuing with export of freshwater fish from Andhra Pradesh

The Institutional Context

The institutions that have a role to play in the seafood export sector are five and they are:

1. The Marine Production Export Development Authority (MPEDA)
2. Export Inspection Agency (EIA)
3. Central Institute of Fisheries Technology (CIFT)
4. Seafood Exporters Association (SEAI)
5. Department of Fisheries

Of these, the SEAI is, as the name implies, an association of the exporters, whereas the Department of Fisheries is the state government body responsible for all fisheries related activities in the state including development, welfare, regulation and management. Here, a brief introduction is provided to these institutions and their activities with respect to seafood production and export

Export Inspection Agency (taken from Sareen, 2001)

The Government of India enacted the Export (Quality Control & Inspection) Act, 1963 with a view to developing the export trade through quality control and inspection, and the Act came into force in 1964. The Act empowers the GOI to notify commodities and their minimum standards for export, generally international standards or standards of the importing countries and to set up a suitable machinery for inspection and quality control. Accordingly Export Inspection Council (EIC) was established as an advisory body to the government and export inspection and certification machinery was instituted in the form of Export Inspection Agencies at Delhi, Kolkota, Kochi, Chennai and Mumbai, with 45 sub-offices that include Vizag and Kakinada.

Marine products have been covered under compulsory inspection and certification since 1969. Initially, only frozen shrimp and canned shrimp were under the purview of statutory quality control and these products were covered under consignment-wise inspection, a system of end product testing and inspection. However, since 1977, a systems approach was followed in which control was exercised through all stages of processing, final production, storage and transportation.

As part of the economic reforms in the early 1990s, export certification procedures were simplified to the point of making the role of EIC/EIAs in control of marine exports negligible. However, in the background of the establishment of the WTO and the consequent changes to the international systems of export and import, the GOI once again made export certification mandatory for marine products, among others. The European Commission recognised EIC as the competent authority for granting approval to the marine product processing units in India which meet the requirements of EC Directive 91/493/EEC and only units approved by EIC were permitted to export to the countries of the EU.

The Marine Products Export Development Authority (MPEDA) (From MPEDA, 2001)

The MPEDA was constituted in 1972 under the Marine Products Export Development Authority Act 1972 (No. 13 of 1972), replacing the erstwhile Marine Products Export Promotion Council which was till then looking after the promotion of export of marine products from India. The role envisaged for the MPEDA under the statute is comprehensive, covering fisheries of all kinds, production, processing, marketing, extension, export standards and training in various aspects of the industry. MPEDA functions under the Ministry of Commerce and Industry, Government of India and acts as a nodal agency coordinating with different Central and State Government establishments engaged in fish production and allied activities.

The development programmes of the Authority are implemented under four major heads:

i. Export production – Capture Fisheries
ii. Export production – Culture Fisheries
iii. Induction of New Technology and Modernisation of Processing Facilities
iv. Market Promotion

The work programme of MPEDA includes:

1. Registration of infrastructural facilities for seafood export trade
2. Collection and dissemination of trade information
3. Promotion of Indian marine products in overseas markets by organising joint and direct participation in overseas fairs and international seafood fairs in India
4. Implementation of development schemes vital to the industry by extending financial assistance for purchase of insulated fish boxes, improvement of peeling sheds, establishment of captive peeling sheds, modernisation of seafood industry to upgrade the processing machinery, installation of IQF machinery, generator sets, flake ice making machinery, quality control laboratory etc.
5. Promotion of aquaculture for augmenting export production
6. Promotion of deep sea fishing projects through test fishing, joint venture and equity participation and installation of equipment to increase the efficiency of fishing
7. Financial and related activities.

In Andhra Pradesh, MPEDA has a regional office at Vizag, which functions as a field office for implementation of various developmental activities of the Authority besides engaging themselves in the export promotion of marine products by providing guidance and assistance ot the processing industry and the export trade. Besides this, a regional office dealing with aquaculture production is based in Vijayawada.

Central Institute of Fisheries Technology (CIFT)

The CIFT was set up in 1954 following the recommendations of a high power committee constituted by the Ministry of Food and Agriculture, GOI, and it started functioning in 1957 under the Department of Agriculture. The administrative control of the institute was brought under the Indian Council of Agricultural Research (ICAR) from 1967. The headquarters of the institute are

located in Cochin, and it has research centres at Veraval (Gujarat), Visakhapatnm (Andhra Pradesh), Burla (Orissa), Mumbai, Calicut (Kerala) and Hoshangabad (Madhya Pradesh). CIFT is the most important post-harvest fisheries research institute in the country, and most of its work relates to the technical aspects of post-harvest.

The Regional Centre of CIFT at Visakhapatnam is involved in research into harvesting methods and post-harvest technologies. Being a member of the Inter Departmental Panel, it plays a role in assessing the processing plants and approving them for certification by EIA. Besides, it also conducts training programmes for people working at various levels of the seafood export industry, besides undertaking extension work to improve quality consciousness amongst the industries.

Department of Fisheries, Government of Andhra Pradesh

The Department is the key government body responsible for the formulation of fisheries policy and its implementation. The administration of the sector is done through six regions each with a Deputy Director responsible to the Commissioner/Director of Fisheries. At the government level, fisheries and animal husbandry are treated as one department, which is headed by a Principal Secretary. The Department also operates a State Project Unit that is responsible for the implementation of a World Bank supported aquaculture project. The Department provides direct support in the expansion of supply from both capture and culture fisheries. It monitors and promotes improved management of the resources, and actively promotes the involvement of small-scale and poorer participants in the sector. Its main activities are (i) construction of fishing harbours and associated infrastructure, (ii) marketing and processing infrastructure development, (iii) Technical support including training and extension, (iv) subsidies and credit to fishermen for acquiring fishing equipment, (v) support to fishermen cooperatives, (vi) fisheries statistics, (vii) various welfare measures and activities for the fisherfolk (DOF, 1998).

Seafood Exporters Association of India (SEAI)

The regional office of the SEAI is located in Vizag. The SEAI acts as a platform for the seafood exporters representing their interests at relevant forums. It brings out the Seafood Exporters Journal, and takes an active part, in conjunction with the MPEDA, in conducting the International Seafood Fairs in India, besides participating in the various international fairs and exhibitions.

Participants in export supply chain in Andhra Pradesh:

The main stakeholders in the export supply chain can be grouped into two broad categories: (i) the 'direct stakeholders', i.e., those who have a direct role to play in the transactions and whose incomes come from profits made during onward export trade, and this includes producers, intermediate traders (commission agents, independent traders, resellers etc) and processors & exporters and (ii) ancillary workers, who constitute numerically the largest grouping in the seafood export sector who include a wide range of poor people involved in miscellaneous wage earning activities such as peeling and processing. The latter have no direct stake in the sale of the product and any changes in the sector affect them secondarily, although by no means less drastically.

The export sector in Andhra Pradesh is inextricably linked to shrimp. Until early-1970s, shrimp was not exactly a very prized catch, although it was caught for domestic consumption in the traditional sector. Prior to the introduction of mechanised trawlers, shrimp fishing was mostly confined to the areas adjacent to the river-mouths of the Godavari and the Krishna, creeks and backwaters as well as the inshore waters, and was done by non-motorised artisanal crafts. Even the larger navas were more interested in the large sized fish – such as the sea perch (*Lates calcarifer*), seer, pomfrets etc, and it was only towards late 1970s and early 1980s, that they diversified operations to include shrimp capture, although by late 1990s, many of them had almost exclusively been concentrating on shrimp.

It was the large-scale introduction of mechanised trawlers in early 1970s, which coincided with three inter-related developments – a spurt in the international demand for Indian seafood, the shifting of the government's emphasis from welfare to 'growth and foreign exchange earnings', and the commencement of seafood exports from new ports like Vizag – that spurred the interest of the producers, processors and exporters in shrimp. The late 1970s and the 1980s were a period of expansion for mechanised crafts and diversification for the traditional crafts in line with the increasing emphasis on shrimp, and the catches for the period show a rapid increase both in production and in exports from the capture sector.

A second major development in the coastal areas in the 1980s has been the growth of aquaculture, which is entirely dependent upon the shrimp for its existence and continued survival. By the time aquaculture came on the scene, many traditional fishing operations had undergone a sea change in their fishing orientation and trammel net – called 'Disco' net – caught on like wildfire. From bycatch, shrimp has become the sole target species in most fishing operations.

Hand in hand with the increasing interest amongst the fishers to capture or culture shrimp went the growth in the infrastructure facilities required for handling, processing, transporting, preserving, and exporting the shrimp abroad. The government – both at the central and the state levels – contributed significantly in providing support to the growing shrimp export trade.

Thus, any assessment of the export industry will need to consider four distinct groupings of people – the artisanal fishers, the mechanised fishing community, the aquaculturists and the processing & export sector participants.

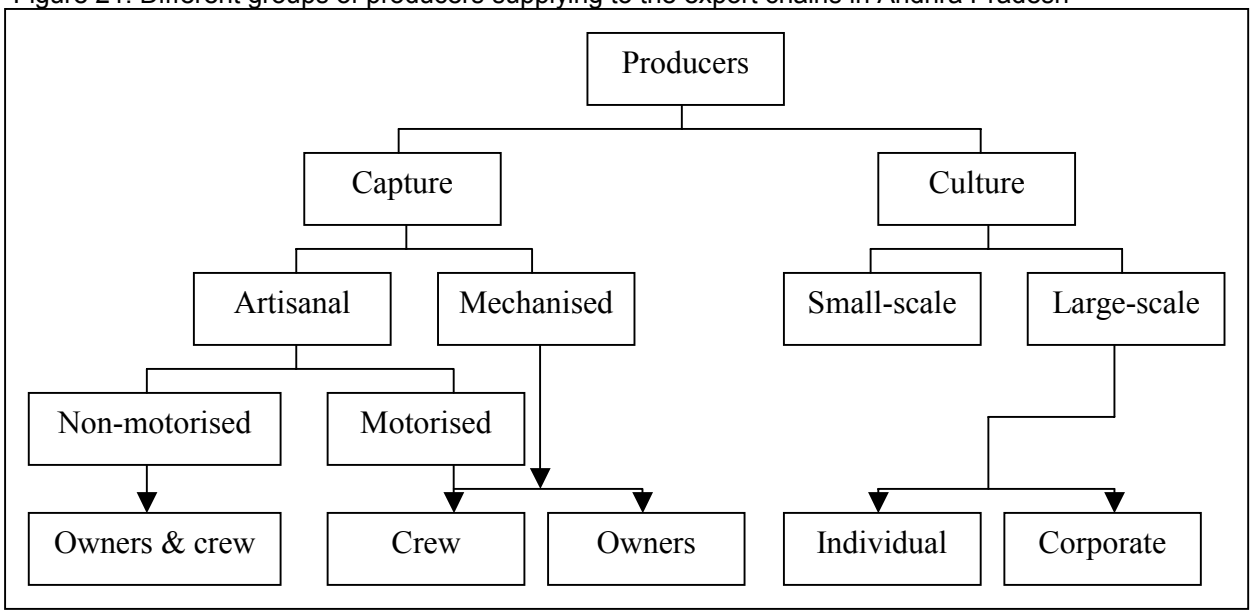
Brief descriptions of the main categories of export commodity chain participants

A. Direct Stakeholders

1. Producers

The producers are those who supply the export varieties of seafood by capture or culture methods, and as indicated, they can be grouped into the following categories (Figure 21):

Figure 21: Different groups of producers supplying to the export chains in Andhra Pradesh



Capture sector

Fishing crew: General Remarks

Fishing crew obviously are the first link in the production chain. Many of these are poor fishers that depend on a share of the catch for their income. Considering that the total number of fishing crafts in the state (including mechanised and traditional crafts) was reported to be 54,227, a large majority of the active fishers who number around 275,000 must be working as crewmembers, although a few of the boats may be jointly owned (DOF, 1998: 15-16). The fishers working in traditional – non-motorised – catamarans are considered to be the poorest amongst the different categories of the fishing crew, and those working on mechanised trawlers being considered the most well off, if only because the latter receive a monthly wage. Being bound to the craft on annual basis, they have little scope to diversify. Most of these fishing systems are characterised by seasonal geographical migrations, and this has an impact on the social and cultural aspects of life. Spending a large part of their life away from the land running after a fugitive resource also requires its own adaptations, which include drinking and (when on land) lavish and extravagant spending habits. There has been an increase in emphasis in fishing operations on capturing export species (because they yield very high returns, and also because the increased expenditure on fishing operations – for fuel, ice, wages etc. – requires that the returns are maximised in order to recover

costs) and this has implications in terms of increased returns – which reportedly help the fishers overcome the reduction in overall catches.

Mechanised Fishing Crew

Mechanised fishing systems – which in case of Andhra Pradesh are trawlers – target only export species, i.e., shrimp, although the other varieties – 'bycatch' – constitute nearly 95% or more of the total catch. Each trawler (or 'mechanised boat' as the 14-mt or less sized boats style themselves) carries six to eight people onboard. Kullberg (1989: 7-9; 12,16) gives a description of the activities of the shrimp trawler crew during a voyage. They receive wages as well as a share in the proceeds from sale of low value species of fish, besides having ownership of the fish that are dried onboard. Initially, the owners took the entire proceeds from the sale of shrimp, while the crew shared the income from fish (Gordon, 1991). Later the owners started taking the proceeds from fresh fish as well, when they realised that they needed to land finfish also to be viable (Rao, 1998). The money realised from shrimp continues to go entirely to the owners, with no share for the crew. According to DOF (2000: 22), there are about 1738 mechanised trawlers in the state (a figure which is patently under-reporting the actual numbers, because it indicates there are no trawlers in Visakhapatnam, obviously the biggest trawler base in the state, if not on the east coast of India), which could mean that at least 15,000 people are employed as crewmembers on these boats.

The crew segregates the fish catch onboard into different categories and Salagrama (1998) provides a description of the different categories into which a trawl catch is segregated. The high quality export varieties – i.e., shrimp – are all chilled onboard, often after being beheaded on the deck itself. Unloading the catches at the landing centre is also the crew's responsibility.

Artisanal Fishing Crew

Considerable quantities of shrimp are caught using trammel nets in the artisanal/motorised sector. The shrimp catches in the artisanal sector come both from the marine and estuarine waters, and a large number of fishing systems depend almost entirely on the shrimp for a livelihood. According to DOF (2000), there are nearly 50,000 motorised and non-motorised artisanal boats in the state, which gives a figure of approximately 200,000 people actively employed in fishing operations in the sea and estuaries.

Motorised crafts: The returns from the catches are shared equally between the owner and the crewmembers after deducting the running expenses. The crewmembers also receive an advance ranging between Rs. 3,000 to Rs. 20,000, the terms of such advance falling into one of two categories: in the first category, the amount is called a 'Katnam' (literally, 'dowry'), which is a packet of money given as a gift to the crewmember in return for his services over a stipulated time period, and this amount need not be returned at the end of the contracted period; in the second instance, the amount called 'Pettubadi' (meaning 'investment') will need to be repaid without interest at any mutually agreed time, and for as long as the crewmember retains this advance, he is obliged to work on the same boat. In a year, a motorised, open-sea based fishing craft fishes for shrimp for about 3 months spread over two peak fishing periods. The income from shrimp can account for up to 60 percent of the annual income to a fisherman, and there are

indications that this percentage could be much higher in some years. The percentage of income from shrimp is said to have been increasing over the last decade as most fishers try to target shrimp more than in the past.

Non-motorised crafts: There is not much difference between the crew and the owners in the artisanal non-motorised fishing crafts, and the owners are not often distinct from the crew in terms of their investment needs or share in the catches. Different sharing systems exist in the non-motorised category. In one of the more prevalent sharing systems, the total income from a fishing trip is divided into a number of equal parts – the number depending on the size of the crew, number of nets used etc – which includes shares for the boat as well as for the nets, and each crewmember receives a part, while the owner of the boat or net receives an additional part towards it. It is also possible that the ownership of the wooden catamarans – operated by a crew of two – rests with both crewmembers equally; hence sharing also is on equal basis. Paying advances to the crew is not a usual practice. For non-motorised, estuarine, fishing craft (such as those in the Godavari and the Krishna delta areas), shrimp constitutes the mainstay of fishing, accounting for nearly 90% of their income. To what extent the shrimp caught by these fishers is exported is obviously determined by the composition of different species of shrimp that constitute the catches. Here too, it is reported that the catches have undergone a change over the last decade in favour of shrimp, which is targeted for its value.

Boat Owners

Boat owners in the mechanised and motorised categories fall into a distinct class from the crew. In both cases, to be able to fish, sizeable investment is required for purchasing/manufacturing a boat, and each fishing operation requires a minimum working capital – for fuel, most importantly – and it is obviously the more prosperous sections of the society who can afford to invest in these systems. The need for investment is compounded by the fact of the high level of risk and this naturally means that the owner-crew relationships in these systems are very capitalistic. It is seldom that a boat owner himself goes fishing, particularly in the mechanised sector, so this brings in another dimension to the owner-crew relationships. In the mechanised sector, also, the ownership could rest with people from non-fishing background, and this also brings a flavour of strict commercial activity to the operations. High investment and recurring costs dictate that the fishing system maximised its returns to the fullest, so these fishing systems tend to concentrate much more on the export varieties like shrimp than others.

Mechanised boat owners

The total number of mechanised boat owners could be between 1,000 and 1,500, considering that several owners have more than one boat. Most of the boat owners reside in urban areas, by virtue of the boats being able to operate from well-developed harbours. Considering that each fishing trip (of 8-10 days duration) requires an investment of approximately Rs. 50,000, the mechanised boat owners are the better off people in the capture fishing industry. The Government of India helps this section of the industry by construction of major and minor fishing harbours, and more directly by subsiding the Central Excise Duty on HSD oil supplied to them, in order to 'increase their fish production and export of marine products' (GOI, 1996:206). The boat owners in most

places have associations of their own, which play an important role in resolving conflicts, and in Vizag and Kakinada, the associations also have a role in deciding the selling price for shrimp.

Artisanal Motorised Boat Owners

In terms of hierarchy, artisanal motorised boat owners are one step above the non-motorised boat owners and one step below the mechanised boat owners. Initial support for acquiring engines and boats suitable for motorisation (made of FRP) came from the government, which provided these through cooperative societies, although in due course ownership got concentrated in fewer hands.

However, motorisation of the artisanal craft (and the newer versions of the artisanal craft, such as FRP boats) has been both a boon as well as a curse to the owners. By making it possible for them to fish farther out than previously, it meant that they could access new fishing grounds, and supplement the reduced catches from the traditional fishing grounds. At the same time, the increased burden of fuel and engine-maintenance expenses forces the owners to be extra-cautious in deciding the fishing trips – they prefer to stay put on shore than go fishing if they are not absolutely sure of getting at least sufficient quantities of catch to pay for the fuel and other expenses. It is reported that most artisanal motorised boat owners – who may have stopped fishing altogether for a few years after acquiring the boat – have restarted going on the boat as one of the crew members themselves and also show preference to take along their close kith and kin for fishing than employ outsiders in order to reduce expenses. The levels of indebtedness amongst the motorised boat owners are also the highest amongst all categories of fishworkers in a rural area, and this has been attributed to high costs of operation, poor catches and uncertain returns. There is a growing trend in many places, for e.g., Srikakulam, East Godavari and Prakasam districts, where boat owners resort to removing the engine from the boat and operate it as a non-motorised boat. In a meeting with the Commissioner of Fisheries, Government of Andhra Pradesh, in September 2002, the fishers of Uppada village submitted a memorandum for modifying an existing scheme for motorisation of fishing crafts to provide boats *without* engines.

Culture sector

Brackishwater aquaculture in Andhra Pradesh took off as a commercial activity towards late 1980s. Fish farmers were provided training by the Department of Fisheries, the Central Institute of Fisheries Education, the Andhra Pradesh Agricultural University etc., and in due course, the Department of Rural Development, the Backward Classes Development Corporation, the Scheduled Castes Development Corporation and a few others stepped in to provide small plots of land for culture purposes to the weaker sections of the society. By the early 1990s, enthused by the success of the early farmers, brackishwater aquaculture grew rapidly, and many corporate firms entered the sector in a big way. Multi-National Corporations (MNCs), such as the CP Group of Thailand, made sizeable investments for setting up feed farms and for procuring the produce from the aquaculture industry for export purposes.

In brackishwater aquaculture, right from the beginning, only two species – *Penaeus monodon* (the Black Tiger Shrimp) and *P indicus* (the White Shrimp) – dominated the culture systems, and latter, with increased access to good quality shrimp seed, the emphasis almost exclusively shifted to culturing *P monodon*, which is entirely exported. There is a new trend amongst shrimp

farmers in the state to cultivate the giant freshwater prawn (*Macrobrachium rosenbergii*) in the estuarine areas, and this is spreading to more traditional shrimp-growing areas rapidly.

The participants in export commodity chains from the culture sector are: small-scale aquaculturists, who own/manage farms of about 1 – 2 ha size and for whom, aquaculture is more a subsistence activity (although a good crop could always mean a sizeable profit to the farmer), and large-scale aquaculturists. The large-scale farmers fall into two categories: one, the individual/family owners of farms and two, the corporate owners. Obviously, all of these farmers can be considered as direct stakeholders in the export commodity chain, and any changes in the international markets or the seafood legislation is likely to affect them the most.

Small-scale aquaculturists

According to the Department of Fisheries (2000:19), there are nearly 70,000 shrimp farmers in the 0-2 ha ownership category, constituting more than 90% of the total shrimp farmers in the state holding 75% of the shrimp culture land with an average landholding of 0.85 hectares. Many people in this category are also classifiable as poor; hence any changes in the export chains would have serious consequences for them.

As mentioned, many of them would have obtained their landholdings under a government development scheme, or, as happened in many cases, by distribution of village commons amongst all members of a community that had traditional rights over them. In many cases, as in East Godavari and Guntur districts, the village commons included mangroves, and inevitably they were cut down to make way for aquaculture farms.

Generally, the aquaculturists in this category have a secondary (or primary, as the case may be) occupation, and this is particularly true of the fisher peoples. The owner takes an active interest in managing and maintaining the farm, including harvesting, in order to keep the costs low.

With the outbreak of the white-spot virus in late-1990s, it has been reported that most of the large farmers – both in the individual and corporate categories – moved out of aquaculture, while a category of medium-scale farmers – individuals in the 2-5 hectare category, who came most often from non-fishing, middle class background – almost completely disappeared, leaving the small-scale farmers the main shrimp cultivators in the state. This has meant that these farmers have started receiving more attention than previously, with the export companies willing to bear – on credit basis – the expenses of feed, seed, fertilisers and other necessities, besides providing support services including ice and transport.

However, it is not as though these small farmers are immune to the white spot disease problems – on average, for one good crop, it is reported, they could lose up to two to three crops to the virus, and it is the large margins that they hope to make out of the good crop which keeps the activity continuing. Over time, it is also true that many farmers in this category have shown willingness to lease out their farms than risk investing money on what is a very highly risky proposition. There are also many farms that are simply abandoned.

The small-scale fish farmers in many districts are in a very difficult situation. The farmers in Krishna district, for instance, have so got used to being land-based aquaculturists that when shrimp farming became unsustainable, they found it difficult to revert to fishing in the creeks and in the Bay of Bengal, and this reluctance is further compounded by the poor returns from fishing, which looked particularly paltry when set against the good income that a good harvest of shrimp would give. And the capture fishing operations themselves have become capital-intensive in the meantime anyway, and yield equally uncertain returns, so it might not really be an option at all for most fishers.

Large-scale aquaculture farms

According to Department of Fisheries (2000), there are a total of 1667 farmers owning over 5 hectares of land, accounting for 13,716 hectares overall, with an average of landholding of over 8 hectares (8.23 ha.). Nellore district has the largest concentration of aqua-farms of this category, with nearly 1200 farms located in that district alone. It is not known how many of these farms are individually owned and how many corporate-owned.

The early 1990s had seen a spurt in corporate shrimp farming, but by late 1990s, the number of these farms came down significantly. At present, there are only a handful of large corporate farms continuing with shrimp farming. One characteristic feature of the large-scale farmers is that invariably the ownership lies in the hands of people who come from non-fishing backgrounds. The field research indicated that the richest people from the neighbouring agrarian communities often own the largest landholdings in a coastal area.

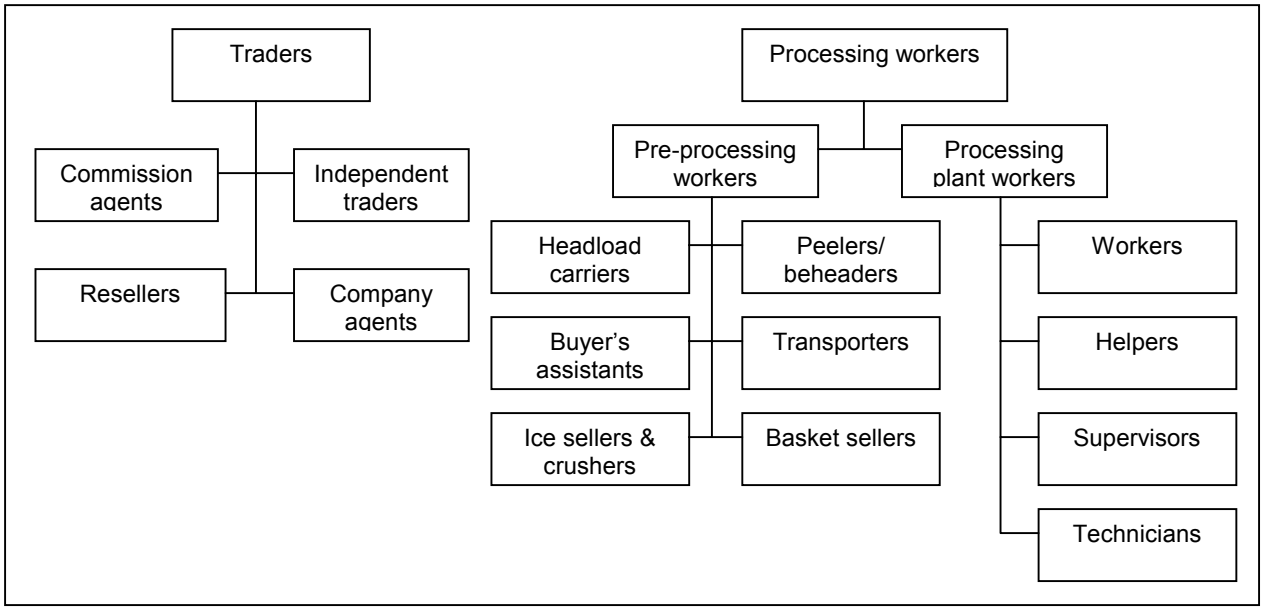
Much of the opposition to the growth of shrimp aquaculture in the coastal areas is directed against the corporate sector, which concentrated its efforts mostly in the southern districts of Prakasam and Nellore. The issue of the corporate aquaculture has become so enmeshed in controversy and contradictory claims that the merits and demerits of their operation may never become clear. By taking over huge tracts of land and using the groundwater resources for meeting their freshwater needs, the corporate practices of aquaculture have been reported to have led to the despoliation of the coastal environment, affecting the quality of life and livelihoods of the people living in the area. Anyway, it has been reported that most of the corporate groups have eventually withdrawn from aquaculture, and this may signal the end of a chapter in the Indian fisheries history.

2. Traders & Processors

Intermediate traders

There is very little information available on these categories of people, although they constitute one of the most significant categories in fish marketing systems. Several of the categories are unreported in the available literature. People acting as middle-'men' could be women as well.

Figure 22: Different groups of traders and processors in the export chains in Andhra Pradesh



i. Commission agents

Traditionally, commission agents were confined to dry fish trade alone, and in fresh fish trade, they were confined to a few large landing centres where shrimp was landed in good quantities. With an increased demand for many varieties of fish, during late 1980s and early 1990s, many fishers turned to procuring fish for outside traders and processors, and this happened as a part of a larger (and informal) process of reorganisation of fish procurement and trade networks in the 1990s. While a large proportion of these people (particularly in villages) come from the richer strata within the fishing community, in other places where larger catches are landed – Visakhapatnam, Machilipatnam, Nizampatnam and Kakinada – poorer people and/or outsiders also act as commission agents. The advantage that the locals have got over the outsiders is that they know their clients and can make objective assessments about their credibility and credit-worthiness, two factors that are important to ensure regular and good returns on the investment.

The commission agents in the capture sector are different from those in the culture sector in terms of the services they provide to the fisher/farmer in one minor detail: whereas in the capture sector, their role is confined to providing loans to the fishers, in the case of culture, they provide assistance in the kind – as feed, seed and fertilisers etc. As shrimp aquaculture grew through the 1990s, many multi-national companies – who initially provided technical know-how to the farmers and had buy-back arrangements for the produce – began setting up and/or importing from their plants elsewhere various ancillary products necessary for the culture operations – feed manufacture, hatcheries, ice plants, pharmaceuticals etc. In due course, as problems such as the white-spot virus mounted, they began providing these services/inputs to the farmers on credit basis, and it was here that the commission agents came to play a vital role in the aquaculture sector.

Each commission agent has an arrangement with a particular company, which provides a soft loan – both in cash and, as required, in kind (i.e., fertilisers etc, as mentioned above) to him in

return for procuring shrimp from individual fishers/farmers on its behalf. The commission agent uses the money/inputs to lend to the aqua-farmers, and for this service, he charges a commission of 10% on the returns from the farmer's crop. He does not levy an interest on the loans he extends, provided the money is returned to him at the end of the crop harvesting; however, if the crop were to fail or the farmer unable to repay his loan for any reason during the current season, the loan amount carries an interest.

The advantage to the company in using a middleman like the commission agent is that it need not employ people for the purpose. In villages that are remote and where catches are limited, it is not to the company's advantage to employ a full-time paid employee for collection of shrimp. The fact that the commission agent knows all his borrowers personally ensures that the repayment is assured, whereas for the company it would be a risk to lend large amounts to fishers/farmers it hardly knows.

For the fishers, the advantage with the commission agent is that he would take their product immediately after landing/harvest thereby relieving them of all responsibility of carrying it to a distant market. Depending on their relationship, the commission agent also lends them some money during lean periods, and in case of unforeseen expenses – such as damages to nets etc. – he provides assistance for repair/replacement. The amount provided as advance is no doubt the biggest incentive for fishers who can hope to meet their larger expenses with the money, and considering that this kind of assistance is not forthcoming from any other source, and also that the interest is collected in kind – i.e., in terms of paying less for the shrimp supplied – they are willing to forego a part of their income for the service. Thus, this kind of relationship cannot be dismissed out of hand as an 'exploitative' practice without making efforts to install systems which are capable of providing the same services along the same lines and pay better prices to the aquaculture farmers.

Over time, it has been reported, as the shrimp catches from the capture sector began to show declines, the companies have become reluctant to invest money in terms of advances to the commission agents. Instead, the erstwhile commission agents are being encouraged to invest money from their pocket and bring the product to the company, which is willing to pay a higher price than previously.

All commission agents are men, most of them belong to the local community and some of them even hold influential positions in the traditional or modern systems of governance in a village. There can be a large number of commission agents in each village, although overt competition is avoided by forming local cartels at every level.

Both the commission agent and the middlemen-trader are relatively new phenomena, who arrived on the scene only after the shrimp export markets began to grow. The numbers of commission agents and traders obviously varies from place to place and from time to time.

ii. Independent traders

This category of traders is confined to capture operations only. These are generally local people, with enough money and experience to set up on their own, and their *modus operandi* differs only

slightly from that of the commission agents. While they too extend interest-free loans to the fishers in return for their produce, their own source of funds is not from processing/exporting firms, hence they can bargain to obtain a better price by selling to whichever company is willing to pay them well. Whereas the commission agent takes some time before paying to the fishers – until he realises the amount from the company – the independent trader pays a mutually acceptable price generally within a day or two after the fisherman hands over his catch – based, no doubt, on the going market rate and after deducting his share. Whereas the handing over of the catch to the commission agent does not mean the end of the transaction for the fisher – the commission agent in turn will need to sell it to the company and receive payment according to quality, size and freshness of the product before making the product, it is finished once the independent trader takes charge of the product and pays a mutually agreed price.

Independent traders – as also the commission agents – procure both from the boats that they have advanced money to, as well as from those that do not have any such obligations. The independent traders in an area – or even a village – can form a hierarchy of their own, with one large trader buying shrimp from a range of smaller traders, with the procurement prices varying from level to level. A smaller trader can sell his shrimp to a larger trader, if the quantities are low, or take them directly to a company when the catches are good so that he gets the maximum profit. The larger traders also have provision for storing shrimp for one or two days if required, so in case of any difficulties in transport etc., the smaller traders prefer to sell to the larger trader albeit for a lesser price than would be obtained if sold directly to a company. It is also said that the larger traders can hope to obtain a better price from the company because of their ability to supply consistently. As systems evolve – and all these categories are relatively new entrants into the picture – there is obviously a constant process of reorganising the networks of procurement and trade, which, coupled with a decline in shrimp catches, means that there can be further changes in these relationships.

iii. Resellers

A number of people are involved in participating in the open auctions on the beach, buying mainly the cheaper fish, but also shrimp depending on availability, and reselling them to traders and commission agents. A majority of these resellers – who are often women – are considered very poor, and this occupation allows them to earn a living without having to invest money, because on most occasions, they collect money from the buyer before making payment to the fishers. However, fieldwork suggested that these women were confined to very few areas – prominently to some villages in the northern parts of the central zone – and about 90 percent of their income came from transactions involving non-export varieties, hence have been left out.

Besides these, company agents too procure shrimp from the fishers/farmers, but being employees of the company earning a monthly wage, they are discussed in the section on 'ancillary participants'.

Processors & Exporters

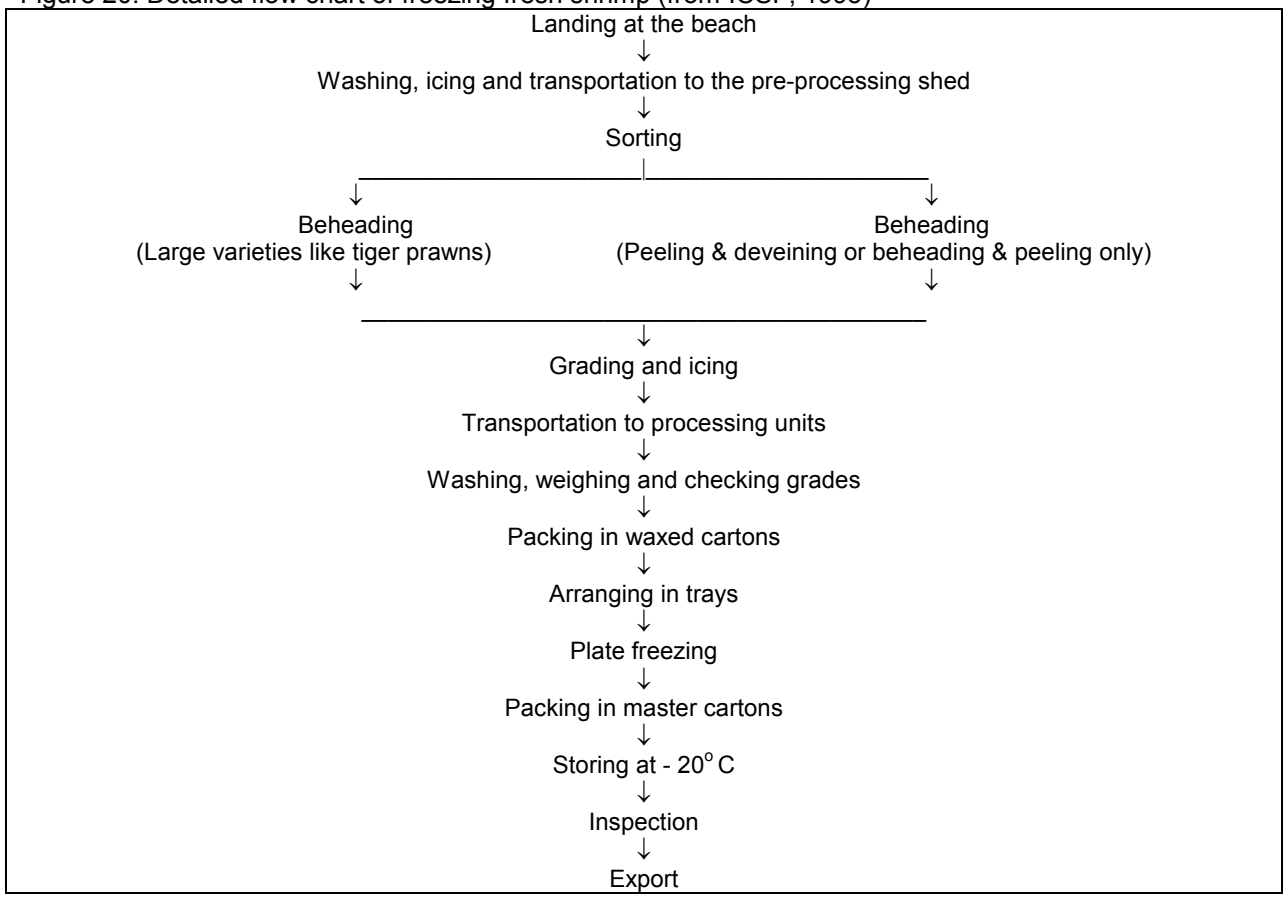
Prior to discussing the processors and exporters, it might be useful to provide a brief description of the various categories and what they do in the context of Andhra Pradesh:

'Processing' – any activity involving operations to (i) reduce spoilage of seafood, and/or (ii) add value to the products by improving their quality or appearance, or by making new products. Processors are distinguished into two large categories.

1. Traditional processors – those involved in making traditional fish products, such as salted, dried and/or smoked fish. The salted & dried varieties include a range of products – dried, unsalted products, salted, undried products, salted & dried products, etc., the kind of processing adopted depending on the consumer demand.

2. Industrial processors – those involved mostly in export processing sector, who could play a role at one or more places in the export processing chain, a schematic diagram of which is given in Figure 20. Processors also include pre-processing workers. Pre-processing operations are those that take place after the material is landed on the shore, and before it reached the processing plant, and could include washing, beheading, peeling and deveining, although quite often some or most of these operations do take place within the processing plant. The 'proper' processing activities include washing, grading, sorting, packing, freezing and storage operations. Some of these operations – peeling and deveining, for instance – are considered to be specialised tasks requiring skills, expertise and experience.

Figure 20: Detailed flow chart of freezing fresh shrimp (from ICSF, 1995)



In the processing sector, a part of the processing is often done close to the landing centre itself particularly in large fishing centres like Kakinada, Machilipatnam and Nizampatnam. As some of these centres are located far from the main centres for processing such as Vizag and Madras, it becomes imperative that a part of the processing – beheading and, some times, peeling – be completed soon after landing so as to reduce spoilage during the period it takes to send the product to the processing plant. These pre-processing centres are often individually owned, and the owners of the centres have arrangements with the processing plants elsewhere to be paid for pre-processing and transport. Until recently, pre-processing activities generally involved beheading and peeling, but increasingly peeling is being done at the processing plant itself. This shifting of pre-processing operations such as peeling to the main processing venues has been reported to be a result of recruitment of large manpower which is required to operate the upgraded processing plants, but who are not fully utilised most of the time. Even processing plants that have not upgraded or taken on new people have problems of under-utilisation of their capacity and manpower, and have begun to optimise their operations by shifting pre-processing to their plants.

One pre-processing centre at Kakinada (Hema Seafoods) used to be involved in peeling and beheading before sending the product to Cochin, but, of late, has been sending shrimp without peeling. Much of the shrimp from capture sector that it buys is often beheaded onboard, and when it is not, labourers are employed at the harbour for beheading. The reason why peeling is stopped in Kakinada is attributed to the excessive processing capacity available to the client-processing factory in Cochin, which tries to optimise its returns by buying whole (beheaded) shrimp. The pre-processing centres at Machilipatnam are involved in both peeling and beheading, the peeled and beheaded product going to local processing plant, whereas the simply beheaded product goes to the processing plants in Chennai. The pre-processing units at Tallarevu used to be involved in both beheading and peeling, but nowadays prefer to send the whole shrimp (sometimes beheaded) to the processing plant.

The details of numbers of processors/exporters, exporters, processing companies, including their status with respect to EU approval and MPEDA registration are provided in Annexure 9.

Processing for the export sector is different from much else in the fishing sector in the country as a whole in that it is in the organised sector (even though the product it processes comes mostly from the informal sector). Being corporate in nature and orientation, it is difficult to generalise the characteristics of people involved in this category, the nature of operations making the people involved in the activity mostly self-effacing and somehow 'face-less'. There are many variations in the available information on the numbers and details of the processing and exporting plants in Andhra Pradesh, and the same confusion pervades the information obtained from the industry sources themselves with the consequence that no satisfactory conclusions could be drawn about the people involved in fish processing and export industries.

A few generalisations could however be drawn about their work: (i) they often come from entrepreneurial classes of the society and the firms seldom are owned/managed by people from traditional fishing castes; (ii) they are involved in a range of other activities besides fish processing and export – examples of their other activities include software development, tobacco and other commercial agriculture and trade, aquaculture and fishing operations etc; (iii) they

have an integrated approach to production, processing and export – owning fishing boats, aquaculture units, hatcheries, feed mills, besides processing units and export licences.

In Andhra Pradesh, most processing plants have an export licence as well, there are exporters – called 'merchant exporters' – who do not have processing plants. They enter into contracts with processing plants for processing their product and then export it themselves. However, it is becoming imperative for all exporters to have a processing plant of their own in the face of more stringent import regulations from USA, EU and other countries.

B. Ancillary participants

Shrimp processing and export activity depends on a large number of ancillary workers, technicians, transporters etc., and the total number of people thus employed is not known.

Auctioneers

The auctioneers do not trade in shrimp themselves, but only arrange the sale through an auction or bargaining system. In some coastal landing centres, a system known as the 'Dutch auction' is practised, where the auction starts at a high price and gradually comes down (Rajendran & Swamy, 1992: 7). Most auctioneers come from the fishing community itself and a majority are men, though women are not uncommon. The auctioneers collect a fixed amount, or a percentage from the catch auctioned, or in kind – such as taking a fish from the catch. Auctioning is not an important mode of sale in the mechanised capture fisheries and in aquaculture, and is confined to artisanal fishing operations.

Company agents

The company agents are all male, and reside in areas where shrimp is produced in abundance. They procure shrimp from capture/culture sources in a pre-determined area. Each company has its own purchase point at a landing centre or an aquaculture village, and it is the responsibility of the company agent to manage the unit. The company agents differ from commission agents in that they are salaried employees of the company. It suits the company to have a regular employee to procure shrimp for them from important landing centres to ensure consistency, good quality, low cost of procurement and promptness.

Working as company agents is a full-time job, and they do not have time to take on a secondary occupation. They could be from any background – not necessarily fisheries – although are sufficiently trained on the job before being given the responsibility of running the procurement centres. Their educational levels are not very high, going up to 10^{th} standard or intermediate levels, and they get paid about Rs. 4,500 per month.

Their main job responsibility involves procuring shrimp from a particular area or a landing centre. Each agent has 5-8 assistants and an accountant working under him, and all these people are the regular employees of the company.

Processing assistants

i. Processing assistants at the landing centre

Each company/commission agent employs some workers at the landing centre who could be salaried or paid daily wages or on piece rate basis, and who assist the agent in weighing the shrimp, washing and sorting them and packing them in ice for transport to the processing plant. Depending on the quantity of the shrimp and the requirements of the importing country, the commission agent also employs from time to time a large workforce of women for beheading and, in case of rural areas, for peeling.

Peelers

Shrimp peelers in Machilipatnam

In some important landing centres like Machilipatnam and Nizampatnam, which are away from important processing areas, shrimp peeling is done in the neighbourhood of the landing centres by some independent traders who set up peeling sheds and employ about 100 women for peeling purposes. In Machilipatnam, both beheading and peeling are carried out at the peeling shed before the product is sent to the processing factory.

Until mid-1990s, it is reported the product was sent to Kerala in insulated vehicles for processing purposes. Only beheading of the shrimp was being carried out and the peeling was done at the processing plants in Kerala. The setting up of a processing plant near Machilipatnam about that time has been instrumental in shifting most of the processing operations to this area. The reduction in shrimp catches in the area has been reported to have affected the profitability of sending smaller quantities all the way to Kerala, but considering there was a spurt in aquaculture production in the area, which offsets the decline in catches, this may need further verification. Be that as it may, there is a definite shift in operations to the local area with the setting up of a processing plant (which has obtained EU-approval). The suppliers now undertake peeling besides beheading, and it is reported that after the setting up of the processing plant, work opportunities for the peelers have actually improved. That there was only one plant in Machilipatnam which sources its product from a wide area, the prior existence of a category of people involved in beheading on contract basis, and the catches of shrimp in the area consisted of lesser penaeids, are cited to be reasons why there was an increase in local workforce for peeling in Machilipatnam.

Most of the women employed in the peeling operations – almost 90 percent – come from fishing castes, the rest being constituted by people from SC communities. They are paid based on the quantity of shrimp they have peeled – the going rate being Rs. 4 per kg, and considering a woman can peel up to 15-20 kg during good landing periods, one can hope to earn up to Rs. 80[13] in a day. Being paid a daily wage, they are not assured of work everyday, and reported that increasing competition has meant uncertainty in terms of getting assured work. There were altogether about 400 women involved in peeling operations in Machilipatnam, and both the peelers as well as their managers were completely unaware of the seafood legislations – and

[13] A woman-agricultural wage labourer earns about Rs. 40-50 per day.

particularly the EU legislation of 1997 – and did not think it made any difference to their livelihoods.

Shrimp peelers in Kakinada

In 1990, there were about 300 local women directly depending on shrimp-based activities at the landing centre in Kakinada. There were about 40-50 'Kaatas' (literally, weighing balance, actually meaning the centres where each commission/company agent conducted his business) in Kakinada fishing harbour in those days, and each Kaata employed 6-8 women for helping out in the various tasks – washing, beheading and peeling, besides packing in baskets/crates.

By mid-1990s, three new processing plants came up in Kakinada, due mainly to the increase in production from aquaculture sources. In contrast to what happened in Machilipatnam, their arrival has meant a serious loss of work for the peeling women. Having their own employed labour (both from Kerala as well as local girls; the former constitute about two-thirds of the total work force in the factories) within the premises, the factories began procuring head-on shrimp, and the women lost the job of beheading and peeling. The employment of a large workforce in the factories, reportedly to meet the obligations for obtaining government's approval, has meant that these employed women could be used for peeling instead of paying wages to another group of people at the landing centre. Most processing plants also began to buy head-on shrimp because the headless shrimp often could get water-soaked when kept in ice and weigh more, thereby costing more and prone to faster spoilage.

Of late, commission agents too shifted to buying and supplying head-on shrimp, and they did not need as many women as they used to. Moreover, there has been an influx of people – mostly from agricultural activities – into fish business and this has increased competition for whatever work was available. The decrease in shrimp catches have meant that most boats began fishing on a daily-basis (instead of the 'voyage' fishing that took one to two weeks), and the relatively few shrimp in the catches could be easily handled by the crew onboard or their wives on shore, making the whole activity of employing women for the purpose superfluous. The peeler-women began to diversify – into fish trade, mostly, but also into a range of non-fisheries related activities as well. A kaata these days employs 2-3 women on a daily wage basis.

ii. Processing assistants at the plant

Shrimp processing is a very manual operation involving skills, concentration and stamina. Each processing plant employs a contingent of over 100 people – mostly women – who are involved in the laborious task of washing, sorting, grading, beheading, peeling, stacking, freezing, packing and storing the shrimp after it reaches the processing plant. While a portion of the staff involved in processing are retained on the basis of regular wages, others are taken on as-and-when-necessary basis, and are paid daily wages.

Most processing companies are reluctant to allow prying into the condition of their processing staff, just as they are secretive about the quality of processing within their premises. This is not to say that the women are exploited or that the factories have something to hide about their

processing facilities, it is just that interacting with the women freely on various issues concerning their livelihoods, socio-economic conditions etc., is a difficult task.

Other participants

There are many small-scale operators involved in the transfer of fish between vessels and the shore and between landing centres and processing plants. At the landing centres and at the processing plants, there are also head-loaders who move fish from one place to another or to and from trucks. Being very poor and involved in 'link' activities such as transporting fish between different points along its production-consumption chain, they remain mostly unnoticed by outsiders.

The village-level procurement and packaging operations require a set of people to assist the commission agent/trader, and depending on the size of operation and the availability of fish on a particular day, each agent/trader could employ a sizeable number of people both on a regular basis as well as for daily wages. Ancillary participants involved in the supply of ice include large-scale operators like ice plant owners, or small-scale traders who bring in small quantities of ice to villages for sale to the fishers. Local bus services are used for transport, as are cycle trolleys and rickshaw pullers. Large-scale transport is done by insulated or covered trucks, and although no numbers exist of the total number of trucks involved in transport of fish, it is reasonable to assume that a large number of people earn a livelihood being drivers, assistants, mechanics etc. Basket weavers and plastic crate sellers are another category of ancillary participants. Many of the people included in this category are specific to particular landing centres, their numbers, functions and arrangements for payment varying widely between places. The same category of people in different locations could be fulfilling different functions, or have two different terms of trade. Obviously, very little secondary information exists on these people, and whatever primary information is collected as part of this research is so fragmentary that it is impossible to generalise the categories or their functions across the state or even a sub-sector.

One other important category of people involved in the export commodity chains is that of people working in the shrimp hatcheries. There are a large number of shrimp hatcheries in the state, with East Godavari dominating the numbers, and these procure brood stock in live condition from the marine capture sector and breed them in captivity. The juveniles of the shrimp (called 'seed') are sold to the aquaculturists by number. Being a secondary stakeholder in the export commodity chain, and given limited time and resources for the study, they have not been studied in detail during this study.

Some general features of the participants in the export commodity chain

A. Gender

Almost without exception, all direct stakeholders in export-commodity chain in the state are men. Even aquaculture operations, which are land-based, are entirely controlled by men, with the women taking on subsidiary roles. In the post-harvest operations too, it is generally the men who are direct stakeholders in the transactions, while women take on secondary, wage-earning roles. Amongst the various intermediaries involved in shrimp trade, women dominate only one

category – resellers on the beach in several villages (but not urban centres) – but the importance of this group to the overall export chains is very limited.

Men control processing plants, and export trade is considered to be entirely the men's domain. However, the women's role as workers in the pre-processing and processing operations is very crucial for the export operations. As a study conducted by ICSF (1995) notes, "Women are considered to have 'natural' capacities and personality traits which make them suited to time-consuming and repetitive work. Women can also be paid lower wages than men, since it is assumed that women's work is always supplementary and never the primary source of income for the household". These women initially came from the fishing community, but increasingly women from other sections of the society too are taking to processing work.

The processing workers will need to be distinguished as those working at the landing centres, who are mostly in the informal sector, and those working at the processing plants, who are regular wage earners. In most important fishing harbours – though not in Vizag – there are women who undertake shrimp beheading as a group venture from time to time. They remove heads of the shrimp at the fishing harbour itself and are paid wages based on the quantity of shrimp they have peeled. The restrictions on undertaking peeling operations in or within 50 km of a processing plant have not touched the shrimp peelers of Andhra Pradesh so far, and if there are instances of shrimp peeling operations shifting elsewhere – as happened in Kakinada – the reasons have little to do with the changed seafood legislation.

Each company also employs a large contingent of salaried processing people – generally women dominate men by a ratio of 10 to 1. Women from Kerala were preferred for processing operations for a long time, because they were considered to be adept at peeling and sorting. It is said that in Kerala, there exist some traditional training centres for teaching girls to sort and peel shrimp in a particular way, and these skills tend to be retained within that particular group of girls alone even though they are working in a distant place like Bhimavaram in Andhra Pradesh. Even now, there are many Malayalee girls working in processing factories, although they face increasing competition from local women.

It is not known how many processing assistants there are in the state, but considering that there are a total of 55 processing plants, employing on average from 100 to 150 people each (though not all of them fulltime), it could be said that about 10,000 women are employed in the shrimp processing units. This figure needs to be verified.

B. Caste

While capture operations show a strong caste orientation, this is not the case in the culture practices. The artisanal fishing sector is entirely dominated by fishers belonging to traditional fishing castes – Pattapus in the southern zone, Palles in the central zone, Vadabalija and Jalari in the northern zone.

The mechanised fishing sector shows variation in terms of the ownership of the boats, which rests with individuals representing a range of castes – particularly in Vizag – although a majority of owners in the predominant category of 14-Mt Sona boats belong to the fishing castes. The

fishing crew on the mechanised boats come from traditional fishing castes alone. The initial period of introducing mechanised fishing through incentives had brought in many people with non-fishing backgrounds into fishing, and during the two decades from 1975 to 1995, it was they who dominated mechanised fishing. Since about the middle of the 1990s, the slump in fishing operations has forced many of these 'outsiders' to sell their boats and move on to other fields – the most general destination being aquaculture. It is reported that the ownership of boats in the mechanised sector is increasingly reverting to the richer people from traditional fishing castes.

With respect to aquaculture, no generalisation can be made about the caste-owner relationships. Small-scale aquaculture is mainly in the hands of some traditional fishing castes (particularly Palles), Scheduled Caste (SC) & Backward Class (BC) communities. Most of the land holdings in this category were given by the government under various programmes and schemes for helping the weaker sections. The only generalisation that can be made about large-scale aquaculture operations is that they are *rarely* owned by people belonging to traditional fishing castes, and it may not be an exaggeration to that the agrarian castes almost entirely hold ownership of the farms.

The intermediate traders – commission agents, independent traders, resellers etc. – generally come from traditional fishing castes. Company agents, carriers, transporters and other people employed by the company for procurement, processing and storage are not confined to any particular castes.

Unlike in Kerala, where religion had been an important factor in terms of supporting/inhibiting entry into processing and other activities, it does not appear to be so in Andhra Pradesh. Traditional (Hindu) fishing castes in Andhra Pradesh have always been supportive of the women's entry into all productive areas, and there does not appear to be any constraint on religious grounds for the women to move into processing work. Even in case of men, export trade and processing operations are considered only a part of fishing. A few of the important seafood processing plants are owned and managed by Christians, but these are mostly people from Kerala, who had set up operations on the east coast of India to supplement and complement their operations in Kerala. There are equally large processing-exporting houses owned by Hindus as well.

The women and girls from Kerala are mostly Christians, but there is no discernible indication that the recruits in the processing plants within the local areas hail from any specific religion. Christianity is spreading in coastal fishing villages in Andhra Pradesh, but it is, as yet, a silent phenomenon, i.e., there are relatively few changes in the livelihood profiles of people as a result of converting to Christianity.

C. Age

Capture fisheries sets a limit on the age group of people who can undertake fishing at the sea. While initiation into fishing takes place at an early age – there are instances of children as young as 6 years old already starting to take part in fishing – it is from an age of about 12 years that a boy can be considered to be an active fisher. A fisherman past 50 would already have exhausted

most of his energy and it is a matter of time – and opportunity – before he retires or is forced to retire. All active fishermen thus can be considered to fall within the age range of 12-55 years.

The ownership of boats however does not have any relation to age, so both mechanised and artisanal fishing units continue to be owned by fairly old fishers, although they do not take an active part in the fishing operations.

The small-scale aquaculture farms are owned and managed by people of 18-50 years of age. The owner in this case has to put in much physical effort and can only come from a productive age group. When an aquaculturist feels unable to manage his farm, he leases it out or hands it over to his sons/heirs. Considering this is a relatively new area, there are hardly any cases of people 'retiring' due to old age etc. There is no relationship between age and ownership in the large-scale farms.

The various post-harvest operations involve skills, dexterity and physical strength to work for continuously long stretches of time; hence people between 18 and 50 years of age dominate this category also.

What the foregoing section indicates is that people of over 50 years have a very limited role to play in the export commodity chains. What happens to a 'retired' fishworker of over fifty, who has few assets and no descendents to take care of him/her is an important area of enquiry for future research, considering that there are ample indications that it is people like this who are often the worst affected in the face of globalising trends of the economy.

D. Occupation

One constraint when discussing about the people involved in the export supply chain is that most of those who have a role to play in exports of seafood also tend to have a wide diversity of livelihoods, with the result that it is difficult to ascribe any changes in their livelihoods to the changes in the export supply chain alone, and vice versa. Apart from those directly involved in processing and exporting trade – either directly or as wage labourers – all the rest are involved in other kinds of work as well. The artisanal fishing systems, for instance, depend as much on other non-exporting varieties as on the shrimp (that are almost entirely exported); even the mechanised fishing systems increasingly depend on non-export items such as ribbonfish etc., for breaking even. The poor people involved in aquaculture are mostly part-time wage labourers, or fulltime fishers involved in aquaculture as another livelihood activity. Similarly the various players who take part in the post-harvest aspects of capture and culture operations at the fishing harbour itself – peeling, grading, icing, transporting etc – also have a diversified occupational profile, and to ascribe all changes in their livelihoods and lives to changing seafood export trade in the state is not always possible or correct.

The one category of people who can be directly considered to be dependent solely on export commodity chains are the processing plant owners and exporters, as well as most categories of people that they employ at various stages from procurement to loading into the ships (though not *all* categories thus employed, because they include part-time workers as well, who might or might not be exclusively dependent on this work alone). Of these, the owners and the managers

of the processing and exporting activities are not poor, while the people they employ could largely belong to the poor category.

Another category of people who are exclusively dependent on exports is the shrimp aquaculturists – both small scale (provided they have no other sources of income) and large-scale operators. Of these, the small-scale farmers who fall into the 'subsistence farmer' category and can be considered to belong to the 'export poor' class. The large-scale aquaculturists do employ a number of people, although there are contradictory reports as to the employment opportunities generated in the coastal areas as a result of aquaculture (the reports deal with the numbers of new employment opportunities generated as against those that are lost due to aquaculture, and, talking from different ideological viewpoints, come to divergent conclusions).

One important feature of the occupations dependent on seafood export trade is the seasonality of operations. Shrimp are caught or harvested at specific periods of the year, and there are certainly periods when the processing and export chain halts for lack of production. It is the mainly some of the women who depend on daily wages from shrimp peeling and other pre-processing operations that appear to be badly affected during these lean periods, as most others have either fixed salaries (for instance, the processing plant workers), or other sources of income (the fishers operate different nets, the fisherwomen on other fish trade or agricultural operations etc.).

The poor within the export commodity chain

The problems in defining poverty in the context of the seafood export sector

An important characteristic of the export commodity chains is the relatively large number of categories of people who are considered to belong to the 'non-poor' category. It is generally assumed that people involved in export commodity production and processing chains are more affluent than those catering domestic markets. The person working as a crewmember on a mechanised boat is generally accorded a higher social position than one working on a non-motorised boat. As a fisherman put it, "When you are handling a high class commodity like shrimp, obviously even one good catch of shrimp could put you in the top bracket in the village – at least for a while".

For instance, the poverty assessment studies conducted as part of this research in various places have ruled out both the owners and crew in the mechanised sector, the owners of motorised fishing crafts, almost all categories of intermediate traders (except some like resellers, whose main source of income is non-export categories of fish anyway), and the owners and managers of processing and exporting companies from inclusion in the category of the poor. The ancillary worker category has the largest number of poor people, although company agents and, in a few cases, even processing plant employees (by virtue of being regular wage earners, although their condition leaves a lot to be desired) have been considered not to belong to the poor category.

That is not to say that poverty and poor people do not exist among those involved in export commodity chain – this research has indicated that many of the poor people in the sector remain hidden behind the general mask of affluence that is the visible feature of the sector, epitomised to the outer world by insulated vehicles and clean processing factory premises. Behind the very

organised look that the sector presents, there are a huge number of people working in the 'unorganised' sector – as carriers, loaders, drivers, mechanics and such like – who do not get considered to have a role to play in the export sector, but also suffer from being ignored everywhere and by everybody, their anonymity making their social and economic existence completely hidden. The white-masked Malayalee[14] processing assistant in a huge processing factory hides a lot more than her face, but unfortunately her life outside of the processing plant – or even within it – is an unexplored story. Thus, whilst the more outstanding categories of the 'Export Poor' are not generally the poorest in the society, those that can be really considered to be poor fall into the 'invisible poor' category, with no information whatsoever on their numbers, roles played and levels of poverty.

This study has attempted to identify those poor people a large part of whose income comes from export commodity production/processing, either as a direct stakeholder or as a wage earner, and characterise the features of poverty in the export sector in general, and as it pertains to particular categories of people in the sector, albeit with mixed results.

Features of poverty in the export sector

The following table (Table 10) is a general summary of the various categories of people in the export commodity chain and their status in terms of poverty:

Table 10: Status of export stakeholder groups in terms of poverty

Category	Reasons for inclusion/non-inclusion in poor category
Mechanised boat owners	Not poor – the scales of operation are too high to enable poor to be involved
Mechanised crew	Not poor – have a share in catches of export species, receive money from owners during fishing, have shares in sale of non-export species; in short, their earnings are much higher than those of the motorised and non-motorised fishing crew, though they may be poorer in comparison with, say, motorised boat owners. Family members may or may not need to be involved in productive functions to meet the family needs.
Motorised boat owners	Not poor – the scales of operation are too high to enable poor to be involved in owning and managing operations. They might be more indebted than the crew, and are potentially more vulnerable to changes in fish availability etc., but are considered to have a generally higher standard of living than the crewmembers.
Motorised crew	Poor – characterised by low returns, and seasonal unemployment; need credit for meeting subsistence needs for at least part of the year, and the man's earning is not sufficient to meet all family needs forcing women as well as other members to work.
Non-motorised owners and crew	Poor – characterised by dependence low returns and seasonal unemployment; need credit for meeting subsistence needs for at least part of the year, and the man's earning is not sufficient to meet all family needs forcing women as well as other members to work.

[14] I.e., processing girls from Kerala state, who speak Malayalam

Intermediate traders (Commission agents and independent traders)	Not poor – the activity requires investment of large sums of money taking it out of the reach of the poor
Intermediate traders (resellers)	Poor, but depend less on shrimp and more on other kinds of transactions involving fish for domestic markets
Processing factories and exporters	Not poor – the activity requires investment of large sums of money taking it out of the reach of the poor
Processing workers at the processing plant	Poor – low wages, no alternative income options
Processing workers at the landing centres	Poor – low and uncertain wages
Company agent & accountants	Not poor – salaried employees of the company
Aquaculture – small-scale (full time)	Poor – characterised by small landholding, physically involvement in culture operations (with family members) to reduce costs, using high quality feeds and seeds only when the buying companies extend support, indebtedness and inability to pursue other livelihood options.
Aquaculture – large scale	Not poor – the activity requires investment of large sums of money taking it out of the reach of the poor

The first thing that can be said of the poor in the sector is that the gender balance in the export commodity chains is heavily tilted in favour of men, and although in some areas – such as peeling and processing – women dominate in terms of numbers. Women's ability to obtain a decent livelihood is heavily dependent on the men who run the factories. It is important to note that whilst all factories employ women as processing labourers, it is often men who are employed as supervisors over them.

Many of the women involved in processing are single, unmarried girls coming from poor families in distant places. The poverty that characterises their background means that (i) their families often depend on their incomes for subsistence, (ii) their future prospects – marriage, settling down to a secure life, etc. – are very uncertain seeing that the girls must find the means to be able to do so on their own, and (iii) their ability to negotiate – let alone demand – for a better treatment from their employers is limited. The origin of a large percentage of these women in a distant state brings in another complication to their ability to integrate into the society they have found themselves living in.

The second category of women who dominate the processing work (in this case including the pre-processing – i.e., peeling, beheading operations at the landing centre) are those from single-headed households, where the woman is the sole bread earner in the family. Once again, they are constrained along the same lines as the unmarried girls, although this vulnerability may not be as sharp as in the case of the Malayali girls.

The second thing is the fact that the old people have a limited role to play in the sector, although in some areas like Machilipatnam, older women do get employed in the pre-processing operations. One has to be at the peak of his/her abilities to be able to remain within the export sector, either as a producer, or as a processor, or as an ancillary worker. The fate of the people

who have passed a certain age is pathetic in many fishing villages, and this has been pointed out to be a result of marketisation of the fisheries economy in the latter half of the 20th century (see Salagrama, 2002).

The fact is that, however lucrative people might consider working in the export sector, there is hardly any surplus. Even if there is, it generally goes to service the lean season demands for subsistence, and by the time a poor person 'retires' from the activity, s/he has literally no resources to fall back upon. It is the lucky few who can afford to live upon their earnings, or on their children's earnings, but a large percentage remains destitute. The fate of the processing women after their retirement from the activity is not known.

Thirdly, being mostly involved in 'invisible' and poorly organised trades such as peeling and processing, there is little by way of employment security, social security and old-age security. Many non-EU approved companies reportedly keep their employees as temporary labourers on record, so they need not be provided any of the facilities that law requires them to give the regular employees. Poor implementation of labour laws and the lack of organisation amongst, or representing the interests of, processing workers and such like, ensure that they continue to be the victims of ill treatment. However, with the EU-approved companies, as the following sections show, there is more employment security.

The following discussion details a few categories of the 'export poor', including small-scale fishermen, small-scale aquaculturists and processing workers. This information was obtained in interviews with groups as well as individuals in the particular groups considered as being poor from the community perspective.

Small-scale fish producers

Shrimp is increasingly the mainstay of fishing operations for small-scale fish producers in the state. Many of the major fishing systems depend on trammel nets and tidal wall nets for capturing shrimp – the exception being the large navas of over 32-feet OAL and some of the FRP boats, which continue to operate large-mesh gillnets and longlines for high value fish. In some cases, there appears to have been a shift in people's perceptions of a good fishing season – nowadays, a good fishing season is one when good catches of shrimp are expected. Fishing does continue through most part of the year, and all fishing systems do have a wide range of fishing gears, capturing a wide variety of fish, but, from the fishers' point of view, it is ultimately shrimp that determines the success or failure of operations.

For the small-scale fish producers, in terms of export trade in particular, there are three issues of concern, which have an impact upon their livelihoods and general well being. These are: (i) mounting costs; (ii) increasing competition from within and outside the sector; and (iii) increasing dependence on middlemen & traders.

Mounting costs

The declines in shrimp catches at the moment are at a level where the income from whatever is caught is more or less sufficient to make ends meet, although this in itself is a major climb down

from a period in not too distant past, when people minted money catching shrimp. With higher incomes from shrimp in the past came extravagance – merited or unmerited – that included motorisation and costs of running the motor, use of ice and iceboxes, taking hefty advances from the traders and paying hefty advances to the crew, expensive weddings and other social rituals, and so on. All these things became a burden when the bubble began to burst. When many boat owners complained that they were a more vulnerable category than the fishing crew who worked on their boats, clearly they were not exaggerating.

The responses to the problem of mounting costs have taken the form of: (i) fishing only when there is a certainty of good catches – which reduces costs, but also effective fishing days (ii) taking own family members as crew instead of outsiders in order to escape having to pay advances and also to share the returns, (iii) increasing fishing durations – often extending over three or four days, in order to reduce cost of travel between the fishing area and the landing centre, facilitated by use of ice and iceboxes (iv) boat owners selling their boats and working as crewmembers in others' boats or moving out of fishing altogether, and (v) using smaller mesh nets to catch as much as possible.

Increasing competition from within and outside the sector

At another level, the shrimp resources being almost exclusively confined to the inshore, these waters became a battleground between the mechanised and the non-mechanised sectors for access to fishing grounds. The Andhra Pradesh Marine Fishing Regulation Act notwithstanding, trawlers continue to fish in the near shore waters and are often involved in direct confrontations with the artisanal sector. Alongside these depredations, inter-village conflicts on use rights for fishing in the creeks that are one of the most important sources of shrimp have begun mounting as a result of increasing numbers of fishing boats in each village.

Yet another problem arose in the form of growth of aquaculture in the coastal regions, and it is undeniable that the traditional use rights of the fishers in the creeks abutting the farms were adversely affected as a result. The discharges from aquaculture farms destroyed much of the natural wild stocks of shrimp in the rivers and the creeks (helped no doubt by increased fishing pressure from the artisanal and the mechanised sectors), the cutting down of mangroves in many areas has meant the loss of good breeding and nursery grounds for shrimp, and it can be said that with the growth of aquaculture the fishers access to the shrimp fishing grounds as well as to the shrimp catches has declined.

Responses to the increased competition have taken the form of: (i) conflicts with the other competitors, (ii) moving to other fishing grounds where possible, (iii) stopping fishing altogether in some areas/during certain periods, and (iv) moving into aquaculture themselves.

Dependence on the middlemen & traders

The dependence on the traders and middlemen is a two-edged sword, and not only for the conventional reason that while delivering certain services they also exploit the fishers at the time of buying their produce. The fishers do recognise the inherent risk that any trader will be carrying when dealing with a perishable commodity like shrimp, and also take cognisance of the

fact that the services that the traders provide in the villages are not easily taken over or even supplemented by other welfare and development agencies, hence the margins that the traders tend to keep are not justified or unjustified, but inevitable. However, this sense of inevitability of dependence on the traders makes it impossible for them to diversify either within the fishing activity or outside of it.

The patronage relationship that exists between the traders and the fishers show two contradictory trends: on the one hand, with fewer days of fishing in a year, the fisherman is increasingly dependent on the trader for his subsistence needs during parts of the year, and also is unable to repay the past loans; while on the other, the traders are increasingly reluctant to invest in the capture fishing operations for their supply of shrimp because it has become too uncertain, and hence they try to extricate themselves out of the financial relationship with the fisherman. Many fishers continue to remain linked to one particular trader for long periods because they are unable to find a more lucrative arrangement with another trader and are unable to pay the outstanding loan to the trader by their own means. The traders too continue to rely on long-term associates for regular supply, and for the rest, choose to buy in open auctions or from aquaculture.

With the declines in catches of shrimp still continuing, and the fishers caught in a 'shrimp-trap', it is a matter of time when the input costs clearly override the outputs, as has been pointed out by many authors (see FFP, 2001), and when this happens the apparently more affluent fishers in the coastal villages will have become quite poor indeed. Therefore, small-scale fishermen can be considered as the '*Potential Poor*', in the face of increasing vulnerability because of reduced catches.

The poverty of the small-scale fishers who depend on shrimp for their livelihood is thus a result of:

(i) Continuing reduction in access to, and availability of, shrimp
(ii) Need for excessive investment in fishing – the amount spent often exceeding the returns
(iii) Lack of opportunities for diversification of occupations because of lack of the knowledge, skills, ability, opportunities and time
(iv) Excessive dependence on shrimp on the one hand and on the middlemen and traders on the other (which is particularly acute in remote villages), and
(v) Lack, or inadequacy, of security nets – in terms of use rights and access rights, and lean season assistance

It can be argued that some of these factors affect the most affluent participant in the export chain as much as they do the artisanal fishworker, although it appears that while for the richer people, this is just a business loss to be made good in future transactions, for the poor, it means hardship and inability to meet basic survival needs during certain parts of the year. In fact, the most important reasons for the loss of access to resources – influx of trawlers and restrictions by aquaculturists – has to do with the more affluent people in the sector, so the loss of the fishers from this source – which is arguably the most important debilitating factor affecting artisanal fishing operations – is to the gain of the richer people. As for the processors and exporters, it is a matter of indifference to them as to who supplied the shrimp so long as there is a continuous

source of supply; hence they could not be affected by the loss of access to traditional fishers either.

Small-scale aquaculturists

The other category of people in the export chain who could be considered as being poor is the small-scale aquaculturists. As with all export stakeholders, this is a category of relatively recent origin (less than 20 years old), and owes its existence and continued survival very much to the government assistance in the initial stages – in terms of obtaining land, training and financial assistance for setting up the farm – and to the exporting companies (including multi-national corporations) in the latter period, who continue to support them with assistance in the form of providing shrimp seed, feed, fertilizers and miscellaneous expenses (as loan, of course).

Although not as poorly off and vulnerable as the small-scale fishers are, this category of people were considered to be facing problems mainly as a result of the white spot virus, which made all culture operations very risky. The culturists contended that they could barely hope to get one reasonably good harvest in every three cycles of operation, and that this would mean high levels of risk, anxiety, indebtedness and uncertainty. They lack opportunities for diversification, either within the aquaculture or fishing sector, or elsewhere. Even to try and sell or lease out their farms for a fixed amount is no longer possible with the result that the farms lie idle. Slowly, they are disposing off their farm equipment – engines etc. – at rock bottom prices, and this, they contend, will have serious implications on their ability to continue aquaculture operations in future. Many of the small-scale farmers went in for culture operations with the assistance provided by companies, commission agents or independent traders in terms of cash or kind, and the failure of the crops has meant that the outstanding loans will need to be repaid anyway. The only consolation – for whatever it is worth – is that with so many farmers having gone bankrupt, the lenders are in an equally helpless position and are willing to take back at least their loan amount without interest. However, they have the lands and other fixed assets belonging to the farmers pledged to them and can hope to recoup their investment in one form or the other, and when they do that, the condition of the farmers will become even more pathetic.

Case study: Economics of a shrimp-culture operation

K Hema Sundareswara Rao is a fisherman who received a hectare of tank on lease in 1992 under a government programme to help the weaker sections, although he tended to lease out his tank for the first five years rather than undertake culture operations himself. He was forced to move into taking up aquaculture from 1998 onwards, for two reasons: poor fishing in the creeks and falling lease rates for aquaculture tanks in the area. He decided to try his hand at aquaculture in his pond that had lain idle for a year.

In the past five years, he has taken up seven cycles of culture operations. Out of the seven cycles, he has lost completely in two operations, succeeded in making a good return in three, broke even (no loss-no profit) in two cycles. He says it is the occasional good crop that has kept him so long in aquaculture, but after he managed to clear a debt incurred earlier this year due to one failed crop with returns from a good second crop, he has decided to begin fishing once again. But for fishing, a second-hand boat with nets will cost Rs. 12,000, and traders are no longer interested in lending money for boats.

The cost-benefits of Rao's last three operations (for which detailed information exists) would give an idea of the economics of shrimp culture.

	All figures in Indian Rupees			
	Cycle I	**Cycle II**	**Cycle III**	**Cycle IV**
Period of operation	March 10-May 31, 2001	July 25 – August 8, 2001	Feb 24-March 24, 2002	April 31 – August 15, 2002
Costs:				
Pond preparation	3350	0	3500	1000
Seed	10800	3800	10000	8000
Diesel	6650	800	4750	7600
Feed and 'medicine'	51690	2000	10980	27800
Labour	2100	0	600	3000
Transport	650	0	550	600
Miscellaneous – lease on land	275	275	275	275
Total Investment	75515	6875	30655	48275
Loan from the company (in kind)	57690	4000	22455	36400
Personal investment	17825	2875	8200	11875
Returns:				
Harvest (in Kg)	530	0	60	310
Count-size of harvest (pieces/kg)	35 (265 Kg) 48 (265 Kg)	0	280	80 (110 Kg) 50 (200 Kg)
Price per kg (Head-on)	210 (35 count) 195 (48 count)	0	30	173 (80 count) 260 (50 count)
Total amount generated in the cycle	107325	0	1800	71000
Profit/Loss	(+) 31810*	(-) 6875	(-) 28855	(+) 22725

*Done in partnership with a cousin, so Rao's share was about Rs. 16,000. All the rest were independent operations.

The farmers reported that they depend on their wives for meeting their subsistence needs – the women increasingly turn to work as housemaids, construction labourers, agricultural workers etc., and contribute the most to the family management.

The features of poverty to the producer groups can be summarised as:

i. Low and uncertain incomes
ii. Increased workload
iii. Periods of unemployment
iv. Compulsory indebtedness during certain parts of the year to meet subsistence needs
v. Necessity for women and other family members to work
vi. Competition and conflicts with people from other sectors as well as within the sector
vii. Taking up criminalized occupations (mangrove felling, shrimp seed collection, illicit liquor brewing etc.)
viii. Destitution amongst the aged and infirm people, due to lack of old age insurance and social security

Processing workers

Being the ancillary participants in the industry, the problems of the processing workers have not received as much attention as they deserve, and this is particularly true in the case of Andhra Pradesh (the plight of processing workers on the west coast of India is relatively better documented and, may be, understood). The fact that a large percentage of the processing workers are women, and that a significant proportion of them are migrant workers from Kerala, makes them doubly vulnerable to exploitation, and the lack of much understanding about their conditions makes it worse. Poor education (though considered more literate than their local counterparts – cf. ICSF, 1995), lack of adequate communication skills to make their way in an alien society, the conditions of cloistered existence that their job demands of them, and their general conditions of poverty to begin with have all a role to play in increasing their vulnerability and exploitation. ICSF (1995) provides a detailed picture of the women and girls migrant workers in the processing industry, their background, recruitment, the contractor-system, terms and conditions of employment, the work they are involved in, and details of the accommodation and social life of the girl workers. The study unfortunately is not detailed enough for Andhra Pradesh, but the conditions it describes more or less fit the picture that emerged out of the field research. For instance, the study says of a processing plant in Andhra Pradesh, that 'it is well organised and well maintained, the working conditions for the girls are also good. All the same, the young girls are confined to the four walls of the factory, which is at some distance from the town. They go out mainly to attend the Sunday mass, when they also do some shopping. Their recreation is watching the TV at the factory site itself.

However, not all processing plants offer even such conditions, particularly in terms of work. From the information that could be obtained from the girls themselves, it appears that what Beena (1992) described as the problems of women workers in the fish processing industries continues to remain valid. She notes that the processing workers are characterised by low wages (currently, a processing worker earns about Rs. 1,200 to Rs. 1,500, although more experienced girls could earn up to Rs. 2,000 per month), long and irregular working hours (12 hours at a stretch) the time of work being determined by the arrival of shrimp for processing, hard and tedious work compounded by the management's efforts to get the most out of them, etc. Such long hours of work in ice cold conditions often leads to headache, back pain, muscle cramps and skin problems, and many workers apparently suffer from anaemia, perhaps due to malnutrition. The plight of the workers was worsened by the added competition from women belonging to other communities, which reduces their bargaining power considerably.

As mentioned, most processing plants provide accommodation to the workers, often within the premises of the processing plant, more to ensure that they could be made to work as and when required than to 'save them the labour of finding accommodation elsewhere, necessitating payment of excessive rents and facing harassment into the bargain', as claimed. There are reports from the girls themselves complaining about their poor and unsanitary living conditions, but these will need further investigation. Most processing plants also keep the girls on the 'temporary labourer' category, effectively blocking their chances for a fair deal through legal mechanisms.

The Factory Act and the Inter-State Migrant Workers (Regulation of Employment and Conditions of Service) Act of 1979 are apparently applicable to the migrant workers, and these Acts do provide certain safeguards to them, but are largely bypassed, and ICSF (1995) details how the processing plants manage to evade the implementation of the Acts.

However, adoption of EU/HACCP norms, and their effective implementation will indeed make for a radical change in the conditions of these girls. Any factory intending to obtain EU certification for export would be assessed for the condition of its workers. Besides stipulating the numbers of people that a factory would need to employ, based upon the capacity of the factory, the norms also stipulate that the full details of the employees – names, photographs, family details including address – be submitted when applying for registration, effectively legitimising the employment of these women, and thus, their ability to demand for a fairer treatment.

The EU norms also stipulate that the living conditions of the workers in the factory be good for a decent life – provision of cots for sleeping on, well equipped kitchens, good sanitation facilities, issue of health cards to each and everyone of the employees, compulsory visit by a medical doctor every fortnight, maintaining a dress code, providing a change room for the girls including a separate locker for each to keep her things, and so on, all of which will be monitored by the inspection teams regularly can only mean that the switch-over to the EU plan can help improve the living conditions of the processors.

Among the women peelers of Machilipatnam, old women, widows and children of less than 12 years constitute a large number. The stringent application of the labour laws in recent times in order to discourage children from working have reportedly meant that the managements are reluctant to take children to work in the premises. The old women and the widows depend solely on the peeling activities for subsistence and survival, and should the seafood legislation ever insist on the peeling activities be conducted within the processing plant, these women will be first casualty.

To summarise, this section has discussed some features of poverty as it pertains to all stakeholders in the sector as well as to particular groups of people – the intention being to give a flavour of the issues concerning poverty rather than to attempt a definitive account of poverty in the export commodity sector in the state. As the foregoing discussion shows, there is clearly a vast gap in our understanding of the export poor, and there is every need to redress the gap, and while a study like this can only go to some length with this kind of exploration, it can only be the government – or an agency backed by the government – who will be able to provide a more comprehensive understanding of the poor in the sector.

Food safety legislation and its impact on the industry in Andhra Pradesh

Firstly, when talking of 'changes in seafood legislation', one must keep in mind that these changes have to do with the international seafood legislation – more particularly, with the EU and the USFDA legislations pertaining to seafood. The national standards have remained more or less as they have always been, hence only those stakeholders who have a direct marketing link with the EU or the US have felt the direct impact of the changed legislations. In case of Andhra Pradesh, the US legislation on the compulsory installation of Turtle Excluder Devices (TEDs) and the insistence on upgrading the current production systems to HACCP standards as a precondition for exporting seafood into that country has had a more serious impact than the EU legislations considering the sizeable market that US presents to the Andhra Pradesh exporters.

On the face of it, there is no evidence that the EU ban of 1997, and the subsequent legislation (i.e., insistence of more stringent controls on seafood processing though the adoption of HACCP and periodical monitoring regimes) have made much impact upon most stakeholders in the export commodity chain. It might even be true to say that, apart from the processing plants and the exporters, not many in the fishing industry are even aware of a serious change in the seafood legislation of the importing countries. That is not to make light of the changed legislation itself, or to claim that it has no relevance for different sections of the stakeholders, particularly in the context of the possibility of a further tightening of the international seafood legislation as a result of the WTO agreements etc. But the ground reality is that the information has not percolated – verbally, or in concrete terms – to the level of different stakeholders. In the short term, this means that the producers continue to go about their business as usual, but in the long term, this will have serious repercussions all around. The recent furore over the issue of using antibiotics in the aquaculture sector underlines this concern.

The producers – artisanal and mechanised fishers, small-scale and medium-to-large scale aquaculturists – in all areas studied have only a dim recollection of a period 'some five to six years ago' when there was a stoppage of all shrimp purchases, but this is considered to have been no more than a temporary nuisance. It has not even been possible to pinpoint the period when this happened, so whether this could at all be attributed to the EU ban remains inconclusive. Subsequently, there has never been a complete halt to shrimp buying operations, although prices have fluctuated between extremes to the extent of making fishing at certain times totally uneconomical. The aquaculturists faced a similar drop in the procurement prices of shrimp in the post 11th September 2001 period, which – ironically – coincided with a bumper harvest of shrimp – the most successful in recent times.

The commission agents and other intermediate traders too do not have a good recollection of any ban, or any changes in their procurement and sale practices subsequently as a result of the EU legislation. Activities such as shrimp peeling at the landing centres may have been curtailed in places like Vizag, but continue to take place in other areas, and the reasons why there has been a shifting of peeling operations have more to do with factors other than changes in seafood legislation. In any case, the women who are involved in the operations undertake a range of other livelihood activities as well; hence the impact of curtailing such operations does not appear to have been seriously felt.

A few processing plants and exporters reportedly faced a severe crisis – in the short term – when their consignments to the EU were rejected in 1997, but to the extent ascertainable during this research, it does not appear that any of the product from Vizag was banned or rejected. However, the industry did feel the impact in a 'psychological sense', as one processor/exporter put it.

The fact that Japan and the Southeast Asian countries are the biggest buyers of Indian seafood sent through Vizag port could be one reason for this lackadaisical attitude amongst the industry people, but in a rapidly changing international context, it is a matter of time before everyone in the industry will feel the pinch of a change – a fact that has been voiced by many people, mostly from the processing and export industries and from the government agencies. When this happens, it will obviously have widespread impact on everyone involved in the production, processing and trade of seafood, but in the meantime, there does not seem to be much concern about such eventualities.

The question remains: why then did the industry want to change to the new regime, often spending large amounts of money, if their current market is concentrated elsewhere and can be satisfied even without any additional investment or attention? The first obvious reason is the insistence of the US too to shift to the HACCP regime, and the emphasis on the part of the GOI to ensure that the Indian seafood industry retained its place in the international markets, and encouraging the processing houses to upgrade their skills and infrastructure to the required levels through providing support – technical, financial and training-related.

Another important reason appears to be that the more established export-cum-processing houses have already started looking to widen their market base, and considering that the US follows closely behind the EU in insisting on quality control, it is necessary – and in the long term, imperative – for the exporters to be equipped adequately for any eventuality in terms of changes in import regulations by these two big buyers. After all, it has been reasoned, they cannot depend forever on the southeast markets, because it is possible that the US could put a question mark on the import of reprocessed shrimp in due course, in which case the ultimate loser will be in the Indian seafood producer and exporter.

The crash of the Southeast Asian economies towards late 1990s was pointed out as another reason for the Indian seafood exporters to look west. The better profits to be made from the EU and the US, the possibility of selling to a large number of countries within the EU once the approval is received, and the need to maximise returns in the face of declining exports are all seen to be other causes contributing to this interest in changing over to the EU system by the Indian processing factories.

As has been shown, the exports from Vizag port are levelling off since 1997, and it is their value which is increasing, and with the threat of further declines in availability of shrimp looming large in the horizon, it makes sense to increase returns as much as possible by diversifying both in terms of the products as well as the markets, and the upgradation of the existing processing plants to the EU grade is reported to be a step in this direction.

Yet another reason for switching over the EU standards is simply that it has become an issue of 'prestige', particularly amongst the leading export houses, who believe having EU certification

adds to the prestige and credibility of their firm. It is reported (Dr Gupta, personal communication) that many of the processing plants that have obtained the EU certification nearly two years ago would not have sent even one consignment to the EU, beyond the mandatory one or two consignments that are necessary to retain their certification, indicating that possessing the EU approval has other applications – such as impressing the prospective buyers – as well. It is also a matter of 'keeping up with the Joneses', in a fiercely competitive environment where one firm having the EU certification (by virtue of being an exporter to the EU) should not be looked upon to be better than the one which does not have it (not being an exporter to the EU in the first place), so the latter acquires it as well.

Thus, it can be said, in the post-1997 period, when the EU regulations came into force, all changes in the export commodity chains in Andhra Pradesh are almost entirely confined to the processing infrastructure and operations only, while the production and procurement systems remained more or less untouched (Dr SS Gupta, pers.comm.). The lack of enforcement of the regulations at the production (i.e., onboard the vessels) and procurement (i.e., landing centres, collection points etc.) levels is said to be due to the inability of the existing structures – at the Government of India level or at the state-level – to keep a check on these systems. The lack of clarity in roles between various state- and central-ministries and departments adds to the problem.

As described, shrimp comes from varied sources, from all parts of the coastline as well as elsewhere, caught by a diverse range of actors ranging from the poorest to the richest in the sector, and much of the activity takes place in the informal sector, making it extremely difficult to impose any restrictions and regulations or to implement them. The spread of infrastructure and other facilities (transport, ice, telecommunications etc) is very uneven across the coastal areas in the state – although there are indications that it is rapidly changing for the better – and the mere spread of shrimp landing centres, many of which contribute miniscule quantities of shrimp for export, makes it an uphill task to equip them all alike.

It is possible that there are indirect effects of the changed processing regime in the formal sector – many people reported that there has been an increased awareness about quality, and a consequent improvement in quality at all stages of the production and export chains and so forth – but it is nearly impossible to ascribe this to any particular event, considering that there has been a rapid change in the fish production, preservation, processing systems through the 1990s in general in the state anyway.

The extent of implementation/enforcement of the EU regulation

The EU legislation applies only to those processors who are directly dealing with the EU markets, or, as described above, for those who obtained the approval for varied reasons. From the available information, it does appear that the enforcement of quality standards after the product reaches the processing units are being adhered to by the industry quite scrupulously, , as stipulated in the EU norms, and there is no doubt that it is being effectively monitored by the concerned agencies. There is still a big grey area pertaining to the activities prior to the shrimp reaching the processing factories, and as things stand, there is no agency either mandated or equipped to deal with the quality issues in this area.

The Export Inspection Agency is in overall charge of recommending the issue of EU certification to be accorded to the processing units. To be able to do this, multi organisational teams consisting of representatives of EIA, MPEDA and CIFT were formed at two levels: Inter Departmental Panel (IDP) and Supervisory Audit Team (SAT). The IDP consists of members from all three agencies, and carries out the primary assessment. Following the IDP recommendations, the SAT team – which consists of members from CIFT and MPEDA (EIA has been excluded from SAT for some unascertainable reason) – undertakes a second assessment, and only then do the recommendations get to be forwarded to the EC for approval.

The areas to be covered during these assessments include as many as 36 categories – including the hygiene of the surrounding area, to ventilation, chill room, change rooms and such like – that are necessary to be installed in a processing plant before it can hope to apply for the EU clearance, and these are not only comprehensive, but also require a thorough investigation in each case. In case of water used for processing purposes, it is reported, the water has to be tested for as many as 64 parameters. Annexure 10 gives details of the requirements for approval of a processing plant/vessel to export seafood to the EU.

Subsequent to allotment of the EU approval also, the plant has to undertake periodical checks using a checklist – given in the annexure – and the EIA, with the help of CIFT, undertakes periodical inspection of the factory premises. The system seems to be working effectively, efficiently and along the lines approved by EU. Annexure 11 gives a checklist for maintaining standards in the EU approved plants.

As for those processors who do not export to the EU or the US directly, the EU/HACCP norms do not apply, and it is sufficient if they obtain the national certification. According to the experts at the CIFT, the national standards are not that very different from the EU norms, although the latter demands for more thorough analyses for different parameters. There is a view that, should other countries – particularly the US – move towards a more stringent seafood legislation for imports of shrimp, the national standards might move even closer to the EU norms, if the EU norms themselves are not adapted as national standards.

Possible effects of more widespread and/or stringent regulations on the different stakeholders in the industry

Thus, it can be said that the Government of India does take seriously the possibility of increased restrictions on the Indian seafood and has been imposing stringent controls on the exports – particularly the shrimp, while at the same time extending all necessary support to the industry to cope with the changing export conditions. Many processors interviewed during the research indicated that the 'reforms', as they called them, for improving the standards of the seafood processing activities would have come anyway, EU-ban or no EU-ban, and that they have helped in making the industry more competitive and able to diversify its market base. Most processing factory owners and operators pointed out that the fears of the need for high investment to meet the requirements of the guidelines – insistence on particular types of material for upgradation and so forth – were unfounded, and were no more than the initial jitters that an industry would experience when it suddenly feels threatened with increased government interference in what until then had been their own private enterprise. Now, with increased government support and

cooperation for upgradation, most processors have upgraded their facilities to international standards. With this kind of pro-active support from the government, they contended, they would be able to comply with any changes in the international legislation.

There was initially much confusion with respect to the EU regulations – there was a misunderstanding or misinterpretation of the directives in some cases – for instance, in respect to the laminating material used for covering the walls, or to the use of wooden/plastic boards for storing packaged shrimp in cold storages etc. – and this has been attributed at least partly to the obscurity of the language employed in the EU directive itself, and partly to the over-enthusiastic (mis) interpretations of the implementing officers of MPEDA etc. These were quickly resolved, with MPEDA taking prompt action to obtain clarifications from the EU itself, and canvassing the same to all processing plants soon afterwards. MPEDA has also supported most processing plants to upgrade their facilities to cater to the more demanding markets such as the EU, and at the same time, ensured that the directives are implemented properly. There was a wide-spread feeling amongst the industry sources that the government has been doing adequately in this respect, although some industry people felt that the government's financial assistance could be increased further to help the processing plants to upgrade faster and to even better standards, keeping the long term benefits of such changes in view. Some also felt that the government could take stern action against those plants found wanting in terms of their processing infrastructure or the quality of product, thereby ensuring that the good processing plants do not have to suffer the consequences of poor quality exports by others. Another area where the industry takes the government to task is for its inability to impose and maintain regulations to ensure quality control mechanisms at the landing centres. The Seafood Exporters' Association of India, for instance, has taken the government to task for blacklisting companies for exporting consignments of shrimp that were found to have traces of antibiotics. The Association contended that the problem lies elsewhere – i.e., at the aquaculture farms – and not with the processing industries, and it is the responsibility of the government to ensure that the farmers stopped using antibiotics in their culture practices (Eenadu, 13 October 02).

On the other hand, the potential consequences, should the seafood legislation be made more stringent or to cover all stakeholders in the processing industry, for the already ailing industry (ailing, that is, from other factors) are easily foreseeable. The government will obviously not be in a position to extend assistance to all stakeholders simultaneously to upgrade their systems to stand up to the international requirements, and most of the smaller players will find themselves pushed out of the race in no time.

Already, there are indications that something like this is happening. Many processors interviewed for this study indicated that their operations could become unviable in a few years time if allowed to continue at the current rate, although, as pointed out above, there were others – coming from more established sections of the industry, who have the ability to invest more – who have felt that the changes will help them become more competitive and able to diversify their market base. There are indications of many corporate firms in the sector gradually moving away from fishing and fish processing operations into less risky – albeit less profitable also – areas. It was reported that there have been no new proposals for setting up processing plants in Vizag for some time now. While moving away is possible for some sections of the sector, a large

majority of the people – particularly the poorer sections – will continue to depend on the sea and the exports for their survival, and their needs will need to be considered seriously.

What would perhaps happen is with most small and part-time players withdrawing from the seafood export segment – either voluntarily or as a result of inability to change – exports would get concentrated into fewer hands, and the current poor supply situation also favours such concentration. The intense competition that arose in early 1990s as a result of ever growing demand for exports too has been cited as one reason for the non-profitability of the ventures in due course, and this has led to many plants becoming sick. Many companies have reported taking ailing processing plants on lease either on annual basis, or in terms of the quantities processed. Thus, it is not uncommon to find one plant processing the products from 4-5 companies simultaneously.

Such a change in the market hold – from a large number of short-term and/or low investment operators to a handful of long term players – will make the industry far more sophisticated, able to keep up with the changing international demand and requirements, and more manageable, but the issues of equity and sustainability will still remain.

But these changes will largely be confined to the organised sub-sector of processing/exporting companies in the state in the short term, and it is hard to see their direct impact on the producers, who might be touched only tangentially by these changes to begin with. They would obviously have the effect of reducing the number of new entrants into the sector, thereby lessening competition and possibly pressure on the resource. With fewer companies managing the exports, they would be able to balance their supply-demand situation more efficiently to suit the existing systems, and keep the prices too more or less stable. This will also contribute to more formal systems to emerge in the supply sector, with far-reaching consequences for all concerned.

Already, there is a concern amongst those in the industry that the inability to control quality at the production and pre-processing levels is going to be serious constraint. But with more legislation in the pipeline, particularly for the export sector, it is likely that the whole range of stakeholders will be brought under the purview of the legislation. When that happens, its impact on vulnerable sections like women, the poorer producers, processors and old people will be considerable, but is an area that remains to be investigated. Not having experienced any major upheavals as a result of past and present regulatory regimes, it is difficult to arrive at any conclusions at this stage, except to say that the fact of having no prior experience of such a thing will probably mean inadequate responses at all levels.

That the seafood industry is very ill equipped to take immediate actions to change itself according to the changing international legislation has become apparent during the period this report was being prepared. Following the EU ban on import of shrimp from China, and the issue of red alert notices to Vietnam, Thailand and Myanmar following the discovery of certain antibiotics, Indian government had swung into action to prevent a possible ban on Indian imports (see Text Box 1).

Text Box 1: Stringent controls to be imposed on shrimp exporters (from 'The Hindu', 17 April 2002)

Hyderabad, April 16. A set of rigorous controls will be imposed on shrimp processors and exporters in India to prevent a possible ban on imports by the European Union (EU) and the United States. The EU has already banned import of shrimp from China three months ago and placed Vietnam, Thailand and Myanmar under red alert with a warning that they too would face a ban if they did not stop using certain antibiotics. Shrimp from China were found by EU inspectors to contain residues of certain antibiotics used in hatcheries, which were harmful to health, while Thailand had to recently recall a consignment of shrimp from the sea following the red alert. India too faced such a possibility when the Marine Products Export Development Authority (MPEDA) received a communication from the EU that three consignments, which left from Chennai, Cochin and Paradip for the UK, contained the banned antibiotic, Nitrofuron. Acting swiftly, the Government of India banned the offending companies. It had earlier issued an order specifying the maximum residual limits for antibiotics, pesticides and heavy metals used in fish and fishery products. In order to prevent the problem from assuming larger dimensions, the MPEDA and the State-Level Export Promotion Council (SLEP) of Andhra Pradesh convened a meeting of exporters, processing industries and shrimp farmers from Andhra Pradesh and Tamil Nadu today to discuss certain self-imposed regulations….

Despite efforts such as this, it has been reported (Eenadu Telugu daily, 11 October 2002) that further consignments sent to the EU, US and Japan in the past three months too had been found to test positive for antibiotics, and on the advice of the importing countries, the Government of India has been blacklisting those companies that had sent the consignments. It has been reported that in the past three months, as many as 27 container-loads were rejected (five of them destroyed in the importing country), and that a further 120 containers are facing the prospect of rejection and possible destruction – the full story of the antibiotics-related exports is emerging only now, but details are yet sketchy. As a result of the blacklisting of the companies and the uncertainty facing more consignments, the Seafood Exporters' Association has taken a decision to halt all shrimp procurements with immediate effect (Eenadu, 13 October 2002) and this has meant a serious setback to the producers. It is reported that a team, consisting of industry representatives, officers of MPEDA and the Ministry of Commerce is visiting China, Thailand and other countries that had been banned from exporting to the EU, to study how those countries have managed to overcome the problem. It is not known how this impasse will be resolved.

Recommendations

As indicated, the impact of declining shrimp and fish catches on the livelihoods of different stakeholders in the sector has had a very negative impact. The fact that they continue to survive despite such drastic reductions in catches is entirely due to the ever-increasing international demand for Indian seafood, with the rises in price offsetting reductions in supply (both total production as well as catch per unit effort). If the current seafood export legislation were to become more stringent and/or widespread, which is probable in the context of the increasing trade liberalisation processes and harmonisation of national and international standards, the effect of such legislation on the various stakeholders in the sector could be very serious.

There is already a downsizing in the processing capacities, with most processors opting out rather than invest more on upgrading facilities. Because of overcapacity, it is reported that the processing factories in India as a whole are running at 15 percent of their installed capacity, and efforts to import fish to fill the gap have failed. The uncertainties prevailing in both capture and culture industries are simply too big a risk to take, and it is only a few large entrepreneurs and traditional processing houses that continue to remain in the field by diversifying into other businesses – within the fisheries sector where possible, and elsewhere. This has a lot to do with the supply situation, but if the national standards were to become more stringent, they would have the potential to drastically reduce the number of people in the sector.

When a processing factory closes down, obviously the numerous people employed directly or indirectly will find themselves at a loose end. Although this must already have begun, it has not been possible to ascertain the fates of those who lost their livelihoods as a result. It is possible that some of them would have diversified, but those – like the girls from Kerala, whose livelihood solely depends on being factory workers – would have found it very difficult to obtain alternate employment.

Using this scenario to take the story one step ahead, should the food legislation be extended to cover the producers in a more efficient manner, one of three things would happen: (i) the fishers would continue to operate the same way as they always did, but would have to ensure that the enforcing officials are kept in sufficiently good humour – meaning that neither the producer nor the consumer will get any benefit, but the 'middlemen' – i.e., the enforcers of the regulation – will reap the benefits of a criminalising regulation, (ii) the fishers would take to other non-export species, but this is highly unlikely because the economies of scale would not any more favour reverting to good old ways, or (iii) the fishers would simply have to stop fishing and go into other sectors in search of work – and this is already happening in most coastal areas.

A fourth option would, of course, be that the seafood legislation, as well as the resource management programmes, are taken down to the community level, and with the concurrence and the participation of the communities, a feasible management regime for quality control would be chalked out and the responsibility for implementing the same would rest as much with the communities as with the implementing agencies themselves. Being involved in the exercise as a direct stakeholder, and told what the consequences would be for not complying with the international legislations, the different stakeholders could work out practical and cost-effective measures to enforce the regulations in a more people-friendly manner, and in such a way that

quality would not be compromised. There are enough number of programmes being undertaken by the government – both at the central level and at the state level – to increase the participation of the communities in decision making processes. The widespread programmes for joint forest management, the Janmabhoomi programmes in Andhra Pradesh, many bilateral and international development programmes (DFID's own watershed and urban support programmes in collaboration with the Government of Andhra Pradesh; the FAO-funded programmes on disaster preparedness) being but a few examples of such ongoing initiatives, there is nothing wishful about the possibility of a joint community-government initiative for improving the seafood quality control systems.

But first, a few more steps are essential:

1. First and foremost, the gaps in our current understanding of the various stakeholders in the fishing sector as a whole, and in the export segment in particular, would need to be filled, and more work – both quantitative and qualitative – would need to be done to achieve this. Little information exists on the poor people – their numbers, livelihood profiles, vulnerability, impact of the changes in terms of supply, demand and transformation, and their needs and priorities. Several groups of the poor in the export sector – carriers, transporters, sorters, peelers etc – continue to remain invisible from a policy perspective, and their needs will need to be assessed. The state department of fisheries has the necessary manpower as well as the expertise and rapport with the communities and would be ideally suited for undertaking the work.
2. In spite of having so many agencies as mentioned, we still have little or no knowledge of the people and their livelihoods in the export sector. There is a need and possibility for reorienting our priorities from seafood exports to seafood exporters – from commodities to people – more than the quantity of shrimp exported. The priority would be to know how many people benefited and from what sections of the society from such an export. This might require opening the doors to a much wider range of specialists – sociologists, economists, socio-economists, and so forth – who would be in a position to study the impacts of a change on a wide range of stakeholders and ensure that the negative consequences are minimised while the positive ones are maximised. This arrival on the scene of these experts might also mean a more gender-balanced view of things.
3. The fact that none of the producers and a variety of other important stakeholders was even aware of the changes in the export legislations over the last decade indicates a failure – or, at best, apathy – on the part of the extension services in reaching the poor. Irrespective of whether a change in the sector has impacts for particular groups of stakeholders or not, it is essential that they be brought up to date on what is happening, in order for them to make an informed judgement on the potential consequences of any such changes in terms of their own livelihoods. But the existing extension services have failed to do this. One obvious reason for this is that an organisation like the MPEDA – which knows such things – is grossly understaffed to undertake a task of this proportion, while the extension services of the Department of Fisheries may not have much of an idea about the ban themselves. If the MPEDA were to work in conjunction with Department of Fisheries at least as far as its extension services are concerned, it would yield a more fruitful result.

4. There are gaps in our knowledge of what we have always assumed we know – to wit, the quantity of exports from Andhra Pradesh. These information gaps are very significant in that they do not allow things to be put in perspective, and lead to lopsided allotment of funds, efforts and initiatives in one direction or the other.
5. There are quite a few agencies – MPEDA, Department of Fisheries, CIFT, EIA, SEAI, etc – and an equal number of Ministries at the central level (Ministry of Agriculture, Food Processing, Commerce, etc) all of which have a direct or indirect role to play with respect to exports, and yet, the linkages between different agencies remain tenuous and need strengthening. There is also much duplication of efforts as a result – training, extension and even funding support – and there is much scope for a more focused and better coordinated programme for export promotion.
6. The support extended by the government through MPEDA to the processing industries in coping with the changeover to more rigorous export standards – in terms of financial and technical support, lobbying and advocacy on behalf of the industry and so forth – will need to be extended further down the line, both horizontally (i.e., to people working in the processing industry as wage earners) and vertically (i.e., to people in the production chain – crewmembers, small-scale aquaculturists etc). It is obvious that they must be in tune with the government thinking in this respect both for their and the country's benefit, it is necessary that they be given a more important role in the plan of things.
7. Another important area of concern is the total lack of hygiene and cleanliness at most landing centres and fishing harbours, and from the way the operations are allowed to take place at these places. There is every possibility of increasing the risk of contamination to the seafood. It is widely recognised that not one landing centre or a fishing harbour will meet the national standards in terms of hygiene and sanitation (Tarakan, 1998). There is an urgent need for organising the operations at the landing centres efficiently, and to upgrade the systems and operations to meet the national standards adequately. This is obviously to be done for the most part by the industry, but without sufficient government encouragement and support, this cannot be done.
8. An area of particular concern in most coastal districts of Andhra Pradesh is the lack or inadequate supply of potable water and electricity, both of which are absolutely essential in maintaining the quality of the shrimp for export. Most ice making plants make do with poor quality water and the erratic power supply allows only production of poor quality ice, while at the same time increasing costs. With the cost of ice going up seasonally, the fishers tend to avoid buying at the very time when there are good catches to be had from the sea, thereby affecting the quality of the catch. Making good quality ice available consistently throughout the year is a good investment for the state as a whole.
9. An important constraint still remains to be tackled: many processor/exporters have repeatedly pointed out that the current EU legislation concerning of export of seafood is still not very clearly defined – obscurities still remain. This lack of clarity stems from the heterogeneity of the EU Commission itself, with different member-states opting for/preferring different standards. The responses of different countries within the EU to the shipments that are found not up to the standards of the EU differ. Some countries tend to return the product to the country of origin, or at least leave it at rejection from entering into the country, some others, such as France and Spain, react more strongly and actually destroy the seafood. This leads to a lot of problems for the producers/exporters and they are naturally reluctant to risk their product (and reputation) by sending to those countries.

It is said that the actual seafood markets in the EU countries are far more lenient, and would settle for less stringent quality parameters. There is a need for a common code of conduct for all EU countries, and while formulating the guidelines; it is also necessary to involve representatives of the seafood industry itself, so that they could have a say in deciding to what extent they could go in stipulating optimum standards.

10. In aquaculture, there is obviously a need to regulate the use of antibiotics and other such potentially harmful substances. The white-spot disease has brought into existence a new category of quacks – these are really called 'Shrimp Doctors' and there are reports that they do indeed go around with a stethoscope around their necks. These doctors advise the application of generous dosages of antibiotics at the slightest trace of a problem. However, the practice of prescribing and administering large dosages of antibiotics is not confined to these largely illiterate 'Doctors' alone. Many companies, most importantly big MNCs, are reported to be doing a roaring trade in selling these to the farmers on credit basis. The moment a farmer sees some problem in his farm, he immediately rushes to his agent who in turn procures generous quantities of antibiotics for application in the affected farm. There is a need to regulate these practices, because of their harmful effects not only on the cultured shrimp, but also on the wild populations at large in the creeks and the nearshore waters. MPEDA – in association with the Departments of Fisheries – is undertaking awareness programmes on this issue, and this will need to be further strengthened.
11. All the foregoing recommendations are concerned directly with the seafood legislation, but the most important factor that makes the entire export industry vulnerable to high levels of risk, as perceived by all industry participants – i.e., depletion of resources and poor catches/harvests – remains to be addressed. It is neither possible nor is intended in this report to suggest how the government might address this, there are already many suggestions for improving the situation with respect to capture and culture fisheries systems, and without doing something about it, there is not much that any changes in the seafood legislation could do one way or the other.
12. The single-minded dependence on the shrimp notwithstanding, there is ample potential for diversification of the export basket to include many fish species as well. Although the returns would not be quite as lucrative as in the case of shrimp, there is no doubt that export of fish is also a profitable activity. However, before any attempts are made to diversify, their potential consequences on the traditional stakeholder groups depending on the particular species – dry fish manufacturers and such like – will need to be considered and studied in detail.

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Annexure 1: Coastline lengths and areas of continental shelf in coastal districts of Andhra Pradesh

DISTRICT	COAST LINE LENGTH (km)	AREA OF CONTINENTAL SHELF (km^2)
Srikakulam	200	8,770
Vizianagaram	29	1,202
Visakhapatnam	136	4,288
East Godavari	161	7,571
West Godavari	20	536
Krishna	11	865
Guntur	43	1,373
Prakasam	105	3,859
Nellore	169	4,763
Coastal AP	974	33,227

Source: Directorate of Economics and Statistics, AP quoted in Handbook of Fisheries Statistics of AP, 1997-98

Annexure 2: Persons engaged in actual operation of fishing in Coastal Andhra Pradesh:

DISTRICT	TOTAL FISHER POPULATION	FISHERS: FULL TIME	FISHERS: PART TIME	TOTAL
Srikakulam	74,636	10,538	7,128	17,666
Vizianagaram	29,463	4,619	4,141	8,760
Visakhapatnam	96,416	47,609	5,720	53,329
East Godavari	127,843	26,117	16,138	42,255
West Godavari	52,562	9,861	8,450	18,311
Krishna	53,946	10,273	8,821	19,094
Guntur	41,015	6,841	3,836	10,677
Prakasam	35,331	5,927	5,190	11,117
Nellore	52,094	8,048	7,844	15,892
Coastal AP	563,306	129,833	67,268	197,101

Source: Handbook of Fisheries Statistics of AP, 1997-98, Department of Fisheries, Govt of Andhra Pradesh

Annexure 3: Persons engaged in allied fishery activities:

DISTRICT	MARKETING OF FISH	REPAIRING OF NETS	PROCESSING OF FISH	OTHERS	TOTAL
Srikakulam	9,829	6,343	3,156	1,282	20,610
Vizianagaram	3,289	1,199	727	840	6,055
Visakhapatnam	23,988	11,025	10,618	80	45,711
East Godavari	14,023	5,938	1,597	8,253	29,811
West Godavari	7,553	3,509	1,346	2,507	14,915
Krishna	7,910	2,625	1,397	1,456	13,388
Guntur	2,801	843	207	1,467	5,318
Prakasam	4,633	3,341	1,355	1,749	11,078
Nellore	5,029	1,820	403	2,761	10,013
Coastal Andhra Pradesh	79,055	36,643	20,806	20,395	156,899

Source: Handbook of Fisheries Statistics of AP, 1997-98, Department of Fisheries, Govt of Andhra Pradesh

Annexure 4: Year -Wise Fish Production In Andhra Pradesh (Source: Handbook of Fisheries Statistics of AP, 1997-98, Department of Fisheries, Govt of Andhra Pradesh)

YEAR	MARINE FISH IN TONNES	INLAND FISH IN TONNES
1990-91	115679	136245
1991-92	99135	138876
1992-93	141855	151475
1993-94	154320	167045
1994-95	150259	195128
1995-96	151990	203969
1996-97	152047	207312
1997-98	146545	226314

Annexure 5: Species-Wise Marine Fish Production and Value in Andhra Pradesh During 1997-98 (Source: Department of Fisheries Handbook on Fisheries Statistics, GoAP 1998).

Name of the species	Quantity	Value
	In Tonnes	Rs. Lakhs
Elasmobranches		
Sharks	3144	660.24
Skates	776	116.4
Rays	363	58.08
Eels	1166	93.28
Catfishes	3822	649.74
Clupeids		
Wolf Herrings	615	110.70
Sardines	27565	3583.45
Hilsa Shads	1311	91.77
Anchovies	1297	220.49
Other Clupeids	1800	306.00
Bombay duck	1139	182.24
Lizard fishes	341	40.92
Half beaks and full beaks	174	15.66
Flying fishes	693	97.02
Perches	3086	617.20
Goat fishes	952	66.64
Thread fins	1988	536.76
Croakers	1039	166.24
Ribbon fish	5230	889.10
Carangids	665	119.70
Silver Bellies	2520	428.40
Big Jawed Jumper	389	66.13
Pomfrets	3049	975.68
Mackerels		
Kanagartha	4712	942.40
Other Mackerels	3929	746.51
Seer fish	5313	2072.07
Tunnies	1810	253.40
Bill fishes	733	43.98

Barracudas	228	31.92
Mullets	1551	155.10
Unicorn cods	24	3.36
Flat fishes	433	38.97
Prawns		
Panaeid Prawn	7392	23950.08
Non Panaeid Prawn	10112	7786.24
Lobsters	276	176.64
Stromatopods	8	1.60
Cephalopods	124	93.00
Miscellaneous	46776	5613.12
TOTAL	146545	52000.23

Annexure 6: Item-wise exports from Vizag Port 1996-2000 (MPEDA, 2001: 320-322)

Item		1996	1997	1998	1999	2000
Block Frozen Shrimp	**Quantity in tonnes**	7641.78	7252.7	5736.93	6362.89	6946.31
	Value in Rs.'000	1923357.5	1996149.8	1700782.92	1964195.5	2569864.63
Cultured Shrimp	**Q:**	8052.22	9347.48	13349.82	13062.53	11884.02
	V:	3416941.21	4790813.04	7145387.74	6405005.9	6822056.45
IQF Shrimp	**Q:**	318.74	116.24	3.47	58.49	91.57
	V:	129236.95	32887.33	2179.79	11623.47	26088.73
Frozen Fresh Water Fish	**Q:**	654.54	355.13	283.39	192.96	176.96
	V:	32523.27	19617.6	16141.26	11121.11	10552.74
Frozen Mackerel	**Q:**	347.01	528.59	142.43	183.39	28.48
	V:	15601.48	24241.63	4497.25	4671.16	705.19
Frozen Pomfret (Black)	**Q:**	287.93	920.18	346.86	111.98	227.28
		17525.69	62705.44	18225.48	5521.08	12226.79
Frozen Pomfret (White)	**Q:**	302.33	476.53	61.04	9.8	62.89
	V:	27978.76	47249.05	11827.38	1359.52	10911.43
Frozen Ribbon Fish	**Q:**	236.96	1098.46	913.44	482.04	951.58
	V:	4917.94	28794.44	24914.49	10525.53	22493.73
Frozen Seer Fish	**Q:**	238.18	775.61	499.38	356.83	367.84
	V:	16160.54	55058.57	37678.74	24679.77	28221.13
Other Frozen Fish	**Q:**	554.07	566.05	43.18	0	70.85
	V:	32261.26	37361.76	2646.05	0	3839.15
Frozen Cuttlefish Whole	**Q:**	437.06	1378.46	834.26	534.48	649.7
	V:	24714.63	87857.59	47712.53	35502.46	40159.26
Frozen Cuttlefish Whole Cleaned	**Q:**	74.27	43.16	20.04	78.28	0
	V:	5649.93	3128.64	1766.42	6785.9	0
Frozen Deep Sea Lobster	**Q:**	42.63	0	0	156.79	119.01
	V:	11785.74	0	0	125470.26	88461.94
Frozen Lobster Meat	**Q:**	0	0	0	30.17	4.88
	V:	0	0	0	13781.34	744.26
Dried Fish	**Q:**	72.61	98.32	74.44	18.65	45.38
	V:	7322.93	9062.62	7033.77	1890.17	5417.37
Frozen Cut Swimming Crab	**Q:**	0	0	21.73	23.18	212.61
	V:	0	0	1923.7	2148.77	27878.85
Frozen Surimi	**Q:**	0	124.5	89.12	1065.68	1940.44
	V:	0	5178.71	3330.1	72214.28	131929.82
Port Total	**Q:**	**19339.8**	**23237.68**	**22445.15**	**22744.86**	**23825.16**
	V:	**5670721.76**	**7215370.76**	**9027780.31**	**8698230.6**	**9802649.82**

Annexure 7: Item/country-wise exports of seafood from Visakhapatnam (MPEDA, Vizag: internal document, March 2001)

		2000		2001	
		Quantity (Kg)	Value (Rs.)	Quantity (Kg)	Value (Rs.)
Frozen Pomfret (White)	USA	19200	3304199	0	0
	China	22000	3276113	0	0
	Hong Kong	22100	4226788	0	0
	UAE	9000	1116135	0	0
	Australia	5590	1066988	0	0
Frozen Pomfret (Black)	Canada	7465	482538	49110	1798279
	USA	25400	1496617	22800	1149793
	Malaysia	77460	4293654	74860	3875241
	Bahrain	3200	197990	0	0
	UAE	44000	2736058	27500	1226128
	Australia	5160	339214	5500	350347
Frozen Snapper	Malaysia	0	0	200	7438
Frozen Ribbon Fish	China	664180	16984095	856330	18680293
	Hong Kong	100000	2246270	24000	489682
	Republic of Korea	73500	2027036	0	0
	Australia	17660	451661	0	0
Frozen Mackerel	USA	12160	342954	0	0
	Malaysia	0	0	85640	1748918
	Bahrain	2000	49344	0	0
Frozen Seer Fish	Canada	12224	1188372	76919	5620191
	USA	28798	2843306	499881	36319052
	Indonesia	0	0	19068	1451520
	Malaysia	13480	489910	0	0
	Bahrain	6497	507691	0	0
Other Frozen Fish	China	153660	6463464	0	0
	Hong Kong	25000	1157553	0	0
	Qatar	21190	1568632	0	0
	UAE	500	19184	0	0
Frozen Freshwater Fish	Japan	3900	583475	7500	914514
	Bahrain	4300	232103	0	0
	Qatar	42100	2693376	44060	2633584
	UAE	20500	803010	113100	5668896
	Kuwait	44000	2749765	67000	3888711
Frozen Eel	China	0	0	8680	206842
Croaker	Australia	4860	254742	0	0
Dried Fish	Hong Kong	17310	2108292	28065	3194579
	Thailand	9300	1303761	0	0
Dried Shrimp Powder/Meal	Japan	40000	786900	0	0
Frozen Deep sea Lobster	Canada	0	0	72146	57305459
	USA	105655	85747449	84642	68164798
	Italy	13356	2714487	0	0

Lobster Meat	Canada	0	0	11655	8328504
	USA	4884	744263	18516	5452835
IQF Shrimp	Canada	0	0	7505	1932365
	USA	44001	12981095	16626	3334659
	Rep Korea	50000	12274789	58355	10839400
	Australia	14260	7359276	0	0
	Netherlands	9000	3023475	0	0
	Spain	0	0	14400	4492274
Block Frozen Shrimp	Canada	32000	12487593	8232	2788171
	USA	688443	208116391	981246	244118984
	China	272244	71930791	194164	52235699
	Taiwan	48660	3690247	13000	795195
	Republic of Korea	0	0	7355	1224965
	Malaysia	31254	9930722	141956	28365469
	Thailand	64008	23350640	13000	3733753
	Japan	3891903	1646074967	3817577	1451277669
	Vietnam	32080	10106594	6852	1734486
	Bahrain	2340	435582	0	0
	Qatar	660	84227	0	0
	UAE	488600	98727603	363920	57909744
	Australia	46981	18365660	0	0
	Belgium	192688	42850238	98846	23823710
	France	55993	14781769	13600	2126318
	Germany	21740	11196509	82987	28072866
	Italy	21500	3963733	0	0
	Netherlands	48720	11285004	18000	2901348
	Ireland	13500	5281122	0	0
	UK	486482	194465884	564609	188617097
	Spain	31200	10378393	0	0
Cultured Shrimp	Canada	56943	29418344	122115	50662367
	USA	780584	446222009	1202262	557715869
	China	730213	298623846	447164	171845345
	Taiwan	17930	9064586	0	0
	Hong Kong	38048	20167887	15660	5839248
	Indonesia	37592	16675029	103831	41665243
	Malaysia	0	0	71549	21561679
	Singapore	36720	18475290	70762	30437069
	Thailand	640453	351955919	784987	332359357
	Japan	9097647	5386879701	9858980	5114699028
	Vietnam	210287	110269564	274490	129359315
	Bahrain	50	15701	0	0
	UAE	2200	715622	10800	6879084
	Israel	0	0	9180	3376099
	Australia	430937	215790340	114070	54344029
	Belgium	1220	312936	36760	19674074
	France	0	0	11340	4517225
	Germany	0	0	5574	2234938
	Netherlands	16104	7079851	9000	3410756
	UK	63134	31090118	108498	47714364

Frozen Cuttlefish Whole	China	488600	30323747	395680	22770486
	Thailand	0	0	138600	8642538
	Japan	7480	566766	11284	836356
	Australia	640	50831	0	0
	Netherlands	0	0	22400	1155467
	Portugal	0	0	20712	1219366
	Spain	23000	1710095	31500	3330970
Fr Cuttlefish Whole Cleaned	Germany	0	0	5000	536537
	Spain	31048	3347005	33020	3372822
Squid Rings	UAE	500	56682	0	0
Stuffed Squid	Spain	0	0	2460	194439
Fr Cut Swimming Crab	USA	7791	779936	0	0
	Republic of Korea	102830	15014217	33146	4279147
	Japan	63480	7317697	28540	2636624
Frozen Whole Crab	Japan	16656	1575078	0	0
Surimi	Lithuania	418000	29281208	0	0
	Taiwan	0	0	54000	4086846
	Republic of Korea	276500	16640126	0	0
	Malaysia	93100	7084649	144000	10262027
	Singapore	0	0	25000	1919628
	Thailand	0	0	135000	9769814
	Japan	1064000	73253615	758980	51585433
	Australia	66000	4680195	0	0
Frozen Skewers	Germany	0	0	2400	981111
Seafood Mix	Germany	0	0	3000	344568

Annexure 8. List of processing plants approved for exporting their products to the European Union (Source: www.mpeda.com/)

Sl. No.	Apv.No	Name and Address	Village/District Dt. of EU Apvl.	Category
1.	801	Jasper Aqua Exports Ltd Vamulavalasa (Village), Anandapuram (Mandal) Visakhapatnam, Andhra Pradesh 531 363 Mr. T Antoni Samy,Chief Executive Ph++91 891 566662, Fax ++91 891 566038 E-mail : jasperaqua@vsnl.com	Visakhapatnam Andhra Pradesh Sept. 99	PP
2.	807	KRM Marine Exports Ltd 1-22, 23, Attili Road, Palakoderu, Bhimavaram 534 210 Mr. M. Vellaswamy, Managing Director Ph++ 91 44 6212183, Fax ++91 44 6262528 Email: krm@eth.net	Bhimavaram Andhra Pradesh Dec 2001	PP
3.	809	Avanti Feeds Ltd Ravulapalem Mandal, Gopalapuram 533 274 Mr. A Indra Kumar, Executive Director Ph ++ 91 8855 41681 / 41570 Fax: ++ 91 8855 41680	Gopalapuram Andhra Pradesh August 2001	PP

		Email: avantirp@pol.net.in		
4.	864	Nekkanti Sea Foods Ltd Ethakota Vill, Ravulapalem Mandal East Godavari Dist.533 238, AP Mr. N S R Murthy,Chief Executive Ph++91 891 701039/567767, Fax++91 891 567504 E-mail: nekkantifoods@eth.net	Ravulapalem Andhra Pradesh June 2001	PP
5.	875	Devi Marine Food Exports Ltd Chinkapalem, Repalle – 522 262, AP Mr. Md. Siddik, Manager Ph++ 91 8648 76512, Fax++91 8648 76513	Repalle Andhra Pradesh June 2001	PP
6.	879	Haripriya Marine Food Products Enamadurru Road, Near K G R L Degree College Bhimavaram, West Godavari, Andhra Predesh 534 201 Mr. T Venkateswara Rao, Chief Executive Ph ++91 8816 36844, Fax. ++91 881636866 Email: hari_priya@vsnl.com	Bhimavaram Andhra Pradesh March,2000	PP
7.	886	M.F.V. Surya Teja-III Suvarnarekha Marines Pvt. Ltd Ocean Park, Maharanipeta, Beach Road Visakhapatnam, Andhra Predesh 530 002 Mr.T Raghunatha Reddy, Chief Executive Ph++91 891 562504, Fax++ 91 562504	Visakhapatnam Andhra Predesh Sept. 98	ZV
8.	888	M.F.V. Ravi Kiran-III Suvarnarekha Marines Pvt. Ltd. Ocean Park, Maharanipeta, Beach Road Visakhapatnam, Andhra Predesh 530 002 Mr.T Raghunatha Reddy, Chief Executive Ph++91 891 562504, Fax++ 91 562504	Visakapatnam Andhra Predesh Sept. 98	ZV
9.	894	Suvarna Rekha Exports Pvt. Ltd Vellanki Peddipalem Village, Boddapalem Post Anandapuram Mandal, Visakhapatnam Mr. T Raghunath Reddy, Director Ph ++ 91 891 958933 / 892164 Fax ++ 91 891 562504 E-mail: srml@excite.com	Vizag Andhra Pradesh Oct 2001	PP
10.	897	Universal Cold Storage Ltd 4-139, Peda Amiram, Bhimavaram West Godavari, Andhara Predesh 534 204 Mr. Afzal E Kader Ph ++91 8816 23630, Fax. ++91 8816 22906 Email: libvvrm@md4.vsnl.net.in	Bhimavaram Andhra Pradesh March,2000	PP
11.	916	Devi Seafoods Ltd NH-5, Peravali Road, Tanuku 534 211, Andhra Pradesh Mr. K A John, Director Ph ++ 91 8819 21488, Fax ++ 91 8819 21489 E-mail: dsftd@md3.vsnl.net.in	Tanuku Andhra Pradesh Oct 2001	PP
12.	927	D C L Maritech Ltd. 6-122A North Rajupalem Kodavular Mandal-524 366 Nellore Dist, Andhra Pradesh Dr N P V S Raju, Chief Executive	Nellore Andhra Pradesh	PP

		Ph++ 91 8622 75254 Fax++ 91 8622 75254	June, 99	
13.	935	Hindustan Lever Ltd (Amalgam Enterprises),Pamaru, Krishna District, Andhra Predesh 521 115 Mr A.J. Tharakan, Chief Executive Ph:++91 864 53001, Fax:++91 864 53302	Pamarru Andhra Predesh Dec. 97	PP
14.	937	The Waterbase Ltd Ananthapuram Village, Nellore District Andhra Pradesh 524 344 Mr. P Ravi, General Manager Ph++91 861 331539, Fax++91 861 331614	Nellore Andhra Pradesh April 2001	PP
15.	988	MFV Nekkanti-II Nekkanti Seafoods Ltt., Flat No 1 Jayaprada Apartment, Maharanipeta, Vizag, A P Mr A Sreeram, Chief Executive Ph++91 891 567767 Fax++91 891 567504 E-mail: asreeram@vsnl.com	Vizag Andhra Pradesh June, 99	ZV
16.	999	Jagadeesh Marine Exports 19-22-6/2, Bank Colony, Bhimavaram 534 201, AP. Mr. Trinada Rao, Chief Executive Ph. ++91 8816 33122, Fax ++91 8816 35559 E-mail: jmexport@md4.vsnl.net.in	Bhimavaram Andhra Pradesh July 2000	PP

Annexure 9: Infrastructure facilities available for fish processing in Andhra Pradesh as on 31st March 1998 (MPEDA, Internal Document)

	S.No.	Name of the Plant	Freezing Capacity (Plate)	IQF Capacity	Blast freezing capacity	Total Capacity	Cold St Nos.	Individual Capacities	Cold store total capacity	Ice plant Capacity		Gen set Capacity
										Flake	Block	
		Visakhapatnam Dist.										
1	1	M/s. George Maijo	10.0			10.0	2	80+60	140	20		250
2	2	M/s. Sujatha Sea Foods	8.5			8.5	2	125+50	175	4		63
3	3	M/s. Chowhan Exports	28.0		10.0	38.0	2	200	400	20		360
4	4	M/s. Sreenivasa Sea Foods	3.0			3.0						
5	5	M/s. ECMP	12.5			12.5	3	50+50+50	150	15		165
6	6	M/s. Sri Vijaya Ice and Cold (Pendurti)	15.0			15.0	1		100	35		125
7	7	M/s. V B C Industries (Ind. Estate)	11.0	2	5.0	18.0	4	70+70+70+70	280	15		500
8	8	M/s. Universal Cold Storage	15.0			15.0			85	35		188
9	9	M/s. Vizag Ice Industries	10.0			10.0			80	15		125
10	10	M/s. Nava Bharat Ferro Alloys Ltd.	6.0			6.0	2	100+50	150	30		125
11	11	M/s. V B C Exprots (Fishing Harbour)	7.0			7.0	1	80.0	80	30.0		125
12	12	M/s. Coastal Trawlers	15.0		5.0	20.0	2	100+100	200	10	20	180
13	13	M/s. Nekkanti Sea Foods	20.8		3.0	23.8	3	40+40+55	135	20		125
14	14	M/s. Parwaz Food Packers	14.0			14.0	2	100+80	180	20		160
15	15	M/s. G P Marine Products	12.5			12.5	3	50+30+30	110	20		125
16	16	M/s. Sunny Exports	4.3			4.3	2	45+45	90	6		82.5
17	17	M/s. Lalitha Sea Foods	14.5		5.0	19.5	3	50+50+50	150	40		250
18	18	M/s. Crescent Marine Ventures	9.0		5.0	14.0	3	150+150+50	350			180
19	19	M/s. Minota Aqua	12.0	6	3.0	21.0			100	20		575
20	20	M/s . Gautham Constructions and	5.0	4	10.0	19.0	2	100+70	170	3	3	375
21	21	M/s. Keral Food Packers	6.7			6.7	1	50.0				
22	22	M/s. Alsa Marine	12.0	9	3.0	24.0	4	75+75+75+75	300	10		380
23	23	M/s. S K Big Star	30.0			30.0	2	100+100	200			570
24	24	M/s. N C C Blue water	8.0			8.0	3	50+50+50	150	20		250
25	25	M/s. A P F C Corp. Ltd.,	8.0			8.0	2	50+50	100	15		60
26	26	M/s. Sreenivasa Enterprises	10.4			10.4	2	75+75	150	20		125
		East Godavari Dt										
27	1	M/s. Usha Sea Foods	7.5			7.5	2	50+50	100	20		125
28	2	M/s. Visakha Aqua Foods	8.0			8.0	2	40+60	100			125
29	3	M/s. S G Engineering	10.0			10.0	2	60+60	120			
30	4	M/s. Fish Products Ltd	16.5		1.5	18.0	1		200	10		263
31	5	M/s. A P F C Ltd	6.0		5.0	11.0	1		50	20		135
32	6	M/s. Stork Fisheries	1.5			1.5	1		20	4		60
33	7	M/s. Avanti Feeds	20.0			20.0	2	90+80		15		
34	8	M/s. O F I L	6.5			6.5	1		75			125
		West Godavari Dt										
35	1	M/s. Sandhya Marine	16.0			16.0	2	70+70	140	15		250
36	2	M.s Everest Cold Storage	20.0			20.0	2	60+60	120	20		200
37	3	M/s Ananda Sea Foods	17.5		5.0	22.5	1	60.0	60			200
38	4	M/s Welcome Fisheries	15.0			15.0	1		100	15		235
39	5	M/s. Universal Cold Storage	19.0	4.0		23.0	2	100+50	150	5	10	500
40	6	M/s. Acquaint Exports	30.0			30.0	2	100+100	200			125

41	7	M/s. Sudarshan Sea Foods	13.5		5.0	18.5		30+40+50	120			320
42	8	M/s. Amalgam Foods	12.5	4.0	8.0	24.5	1		100	15		180
43	9	M/s. K R M Marine	12.0		3.0	15.0	2	80+70	150	15.0		
		Krishna Dt										
44	1	M/s. I M F	9.6	8.0	9.6	27.2	2	200+200	400	30.0		320
45	2	M/s. Indus Sea Food	15.0			15.0	2	50+50	100	10		125
		Guntur Dt										
46	1	M/s. O F I L	5.0	4.0		9.0	1	50.0	50	10.0		125
		Prakasam Dt										
47	1	M/s. Suvarna Sea Foods	15.0	9.0	6.0	30.0	3	100+50+50	200	15.0		730
48	2	M/s. Devi Sea Foods	10.0			10.0	1		100	15		
49	3	M/s. Patil Aqua	10.0			10.0	2	50+50	100	15		
		Nellore Dt										
50	1	M/s. Balaji Bio Tech	20.0	10.0		30.0	3	110+110+110	330	36.0		2040
51	2	M/s. D C L Marine Tech	9.3	9.3	9.3	27.9	3	200+175+50		15		750
52	3	M/s. Rank Aqua	12.0	8.0		20.0	2	80+100	180	10.0		680
53	4	M/s. Choice Canning		8.0		8.0	1		100	10.0		320
54	5	M/s. Water Base	21.0	8.0		29.0			300			1600
55	6	M/s. Alsa Marine	5.0		5.0	10.0						125
		Total	**671.5**	**93.3**	**106.4**	**871.2**	**96**		**7690**	**99.0**	**662**	**15101.5**

Annexure 10: Requirements for approval of establishment/factory vessel for processing fishery products for export to the countries of the European Union (Source: MPEDA, Vizag)

0. Fresh Frozen and Processed Fish & Fishery Products intended for export to European Union shall be done in hygienic way as per the requirements of the importing country right from harvesting, through landing, transportation, preprocessing, preparation, processing, freezing, packing and marking till export. The following requirements are stipulated which shall be complied with by an establishment/factory vessel to become eligible to get approval for processing fishery products for export to the EU.
1. MPEDA will provide a list of landing Centres and fishing vessels, which are likely to meet the EU norms. The competent authority will confine their monitoring only to such landing Centres and fishing vessels. The competent authority will also ask the concerned marine unit to provide a list of the landing Centres and fishing vessels being used by them.
2. Fishery products must have been caught in fishing vessels approved by the competent authority.
3. The competent authority shall monitor such fishing vessels when they are at the Port.
4. Fishery products must have been landed and during landing they must have been handled in hygienic conditions vide Annexure – II of 91/493/EEC and Annexure – II of the Notification.
5. The preprocessing and processing like peeling, defining, beheading, deskinning etc., shall be done hygienically only in establishments/factory vessels approved by the competent authority and for detailed guidance Annexure – III & IV of the EEC Directive No – 91/493/EEC & III & IV of the Notification shall be referred. Important points in the Annexure – III & IV referred above are reproduced below:

6. Premises and Building

6.1 Immediate approach of the pre-processing and processing areas shall be such as to prevent contamination from the surroundings.

6.2 Preprocessing/processing establishments shall be housed in a building of permanent nature affording sufficient protection from the environment and shall be of sufficient size for the work to be carried out under hygienic conditions. The design and lay out shall be such as to preclude contamination.

6.3 The lay out of the different sections shall be such as to facilitate smooth and orderly flow for work and to prevent possible microbial cross contamination. All the fishery products handling areas shall be separate from areas used for residential purpose.

6.4 There shall be adequate lighting and light fixtures shall be protected with proper covering.

6.5 There shall be adequate natural or mechanical ventilation.

6.6 The drainpipes for rainwater shall be provided in order to prevent splashing of water into the material handling area through ventilators/windows/other openings.

7. Fly proofing, Vermin and Animal Control

7.1 The doors shall be tightly fitted.

7.2 The preprocessing & processing sections shall have effective fly proofing.

7.3 There shall not be any chance for entry of insects, rodents, birds and animals into the fishery products handling area.

8. Receiving

8.1 There shall be a raised platform for receiving the material from outside for preprocessing/processing and the sides and roof of this platform shall be sufficiently protected from extraneous contamination.

8.2 Semi-finished products and finished products shall be kept separately to eliminate any chance of contamination.

9. Ceiling, Walls and floor of Work Rooms

9.1 The floor of the entire fishery product area shall be water proof, easy to clean and disinfect.

9.2 There shall be facility for proper drainage of water.

9.3 There shall be no water stagnation on the floor.

9.4 The drain water from the working table shall not flow on to the floor in such a way that it may contaminate the area.

9.5 The inner walls of fishery products handling area shall be durable having smooth surface, light coloured and easy to clean.

9.6 The walls shall be free from projection for effective and easy cleaning and all pipes, cables and electric switches shall be water proof neatly covered and in all cases cleanable. If possible the electric switches for

lights in the preprocessing/processing areas should be fixed in other areas where no handling of fishery products is carried out.

9.7 Wall to wall and wall to floor junctions shall be rounded off.

9.8 The ceiling shall be free from cracks and open joints and shall be smooth water proof and easy to clean.

9.9 All doors and windows shall be durable and made of corrosion resistant material. They shall be tightly fitted.

9.10 All windowsills, if any, shall slope/inwards.

9.11 All entry points into the preprocessing/processing unit shall be provided with facility for washing and sanitisation of feet.

9.12 All entry points into the preprocessing/processing unit shall be provided with washbasins fitted with non-hand operable taps at a convenient place.

9.13 Each washbasin shall have adequate quantity of soap, single use towels and nail brush. Foot-operated waste bin shall also be available near the washbasin.

9.14 Instruments, tables, containers, conveyer belts, utensils etc., shall be of corrosion resistant material and with smooth surface so that it will be easy to clean and disinfect.

9.15 Utensils used for inedible /contaminated/waste materials shall be identified with specific mark or colour or shape and shall not be used for handling edible products.

9.16 Ice crusher/flake ice machine shall be available at appropriate place.

9.17 Use of wood is prohibited in all preprocessing/processing areas and in cold storage.

10. Machinery

10.1 Freezing equipments shall be of suitable type to freeze the fishery product and to achieve the required core temperature.

10.2 These equipments shall be fitted with necessary gauges to indicate the temperature, pressure etc. These equipments shall be calibrated at specified intervals.

11. Cold Rooms, Storages

11.1 There shall be chill rooms in the preprocessing and processing sections.

11.2 The chill room shall be of adequate size, suitably located and provided with mechanical refrigeration system to maintain the temperature at the required level (0"C to 4"C).

11.3 The cold storage shall have suitable refrigeration system to maintain the temperature at the required level (-18^{0}C or below).

11.4 The floor of the cold storage shall be water proof and easy to clean and disinfect.

11.5 There shall be suitable defrosting system and suitable arrangement to remove melts water from frost.

11.6 There shall be no ice formation on the packages as the melt water is likely to enter into the packages.

11.7 Walls and ceilings shall have smooth surface and shall be durable, impermeable and easy to clean.

11.8 There shall be adequate lighting of protected type.

11.9 The door of the cold storage shall be of durable material and easy to clean.

11.10 Wood shall not be used in the ante-room and cold storage.

11.11 There shall be automatic temperature recording device (thermograph) for the cold storage.

11.12 Detached cold stores if used should meet the above requirements and should be approved by the competent authority.

11.13 Air curtains shall be provided at the entrance of ante-room and the cold storage.

11.14 There shall be an alarm system in the cold storage.

11.15 There shall be a cleaning schedule and rodent control system for both ante-room

12. **Change room**

12.1 Adequate number of change rooms separately for male and female workers shall be provided for preprocessing and processing sections.

12.2 These change rooms shall be of adequate size and shall have smooth water proof, washable walls and floors.

12.3 There shall be flush lavatory and locked cupboards in the change rooms. The lavatories shall not be open directly to the working area.

12.4 Washbasin fitted in the change room shall be provided with non-hand operable taps, single use towels, soap etc., There shall be a foot-operated waste bin near the washbasin.

12.5 Principle of separate change rooms for different sections depending upon the nature of work e.g. low risk and high risk areas, preprocessing/processing areas shall be kept in mind while providing change rooms.

12.6 There shall be lockable cupboards and facility for keeping gumboots, shoes and chappals in these rooms.

12.7 Suitable in-house arrangements shall be made by the establishment to launder the working clothes of the workers.

13. Transportation system

13.1 There shall be adequate number of suitable types of transportation facilities depending upon the nature of processing.

13.2 There shall be a separate area for cleaning of the vehicles. So that the waste water/grease etc. may not contaminate the environment.

14. Store room

14.1 There shall be separate stores for wet and dry items.

14.2 There shall be separate stores for packing materials. Cartons shall be stacked properly. Pest and rodent control system should be extended to this store also. Cartons should not be kept on floor and should not touch the walls and ceiling. There shall be enough space near the walls for a person to walk around.

14.3 The doors of the stores shall be tightly fitted.

15. Water

15.1 Water used for preprocessing/processing shall be potable and shall meet the requirements of EEC Directive No.80/778.

15.2 Potable water shall be used also for cleaning utensils, machinery, tables etc., in the preprocessing/processing areas.

15.3 A suitable water management system shall be followed and this shall include use of plumbing diagram showing the entire reticulation of the water identifying each tap with consecutive numbers.

15.4 Water store tank both ground level and overhead should be protected and cleaned regularly.

16. Ice

16.1 Ice should be made of potable water and there shall be adequate quantity of ice (proportionate to the quantum of workload) made of potable water.

16.2 In-house ice-production if found inadequate and if the unit depends upon ice received from external source, it should be ensured that ice prepared is made of potable water. Necessary evidence should be available to prove that the ice obtained from both internal and external sources is made of potable water. Regular monitoring of the ice should be done.

16.3 Ice plant not integrated into the main establishment shall have to be approved by the competent authority.

17. Power Supply

17.1 There must be automatic alarm system in the establishment to give warning when there is power failure and alternate source of power (Generator) shall be available.

18. General Conditions of Hygiene:

18.1 There shall be a documented maintenance schedule for all premises, machinery equipments, measuring instruments etc. The measuring instruments like gauges, thermographs, thermometer, weighing balance, pressure gauges etc., shall be calibrated at regular intervals. the following aspects should be included in the documented system:

i) Area/Name, Location and identification number of the equipment
ii) Person responsible
iii) Procedure of maintenance
iv) Frequency of calibration
v) Details of breakdown
vi) Details of rectification/rechecking
vii) Supervisory personnel
viii) Records

18.2 The walls, floors, utensils, ceiling, roof, lining, equipments, instruments etc., shall be kept in good repair following the maintenance schedule.

18.3 There shall be a documented system for pest and rodent control management.

18.4 The documented system for rodent control should include a bait map showing consecutive number of bait stations and records of observations.

19. Washing Area

19.1 Separate washing area should be earmarked for washing utensils, knives, tubs, crates etc.

20. Salt

20.1 Salt if used, should be tested for Staphylococci, Clostridium and Sulphite reducing bacteria.

21. Heavy Metals, Anti-biotics, Pesticide Residues and Biotoxins

21.1 Fishery Products should be tested for heavy metals, anti-biotics, Pesticide Residues and biotoxins. The HACCP plan should clearly address this requirement.

22. Special facility for cleaning

22.1 Whenever special facility is required for cleaning the same should be provided e.g. cleaning of high risk area and utensils for high risk products, cleaning of utensils, conveyor belts, sterilization of butchering knife etc.,

23. Use of Trolleys

23.1 Containers with raw materials, ice etc., should not be kept on the floor. These should be kept either on the trolleys or on raised metal or other suitable pallets.

24. Preprocessing Centres

24.1 Preprocessing centres either integrated or detached should meet the standard prescribed in Govt. of India Notification and EU Directive No.91/493 dated 22.07.91. Detached peeling sheds should be approved separately considering them as separate establishments of the corresponding approved processors. Relevant requirements applicable to the processing establishments will also be applicable to detached peeling sheds. Further separate own check system based on HACCP, other separate documented systems applicable to processing establishments, separate qualified and approved personnel for supervision of the preprocessing operation etc., should be available for these detached peeling sheds also for seeking approval. The distance between the detached peeling shed and processing establishment and the facilities available for transporting the preprocessed material to the processing establishment will have to be considered for approval of such detached peeling sheds. However, common laboratory facility can be permitted provided the distance between the preprocessing establishment and processing establishment is not much.

25. Approval of subsidiary Units

25.1 The experts of the European Commission emphasized that the approval of more than one processor utilizing the same packing, storage, preprocessing and processing facilities is not acceptable to the European Commission. Approval of subsidiary/sister concerns with suffixes P1, P2 etc., shall therefore, not be permitted.

26. Cordoning off Non-operational Area

26.1 Any area within the premises of the establishment which is non-operative should be cordoned off distinctly..

27. Medical Certificate of Workers

27.1 The medical certificates of workers/fish handling persons are not in accordance with the proforma prescribed by the European Commission. The European Commission requires that food-handling personnel should be certified as

"Fit to handle food product and suitable to work in the fish processing plant".

Before issuance of medical certificate as above additional test on stool and/or other tests of individual workers and fish handling personnel shall be required to be carried out to ensure that they are not carriers of pathogens. Periodic medical examination should be conducted preferably annually.

28. Use of approved additives detergents and disinfectants etc.

28.1 Only approved detergents/disinfectants should be used. List of detergents/disinfectants should be declared to the competent authority for approval. Additives if used should be approved and the residue level should not exceed the tolerance level prescribed by the importing countries.

28.2 There should be a documented system with relevant records regarding the purity of chemicals / additives used and necessary controls exercised on the residue of these chemicals in the finished products as per the documented procedures.

29. Own Check System

29.1 Own check system based on HACCP is a mandatory requirement and hence should be planned got approved by; the competent authority and implemented.

29.2 Identification of critical points in the establishment on the basis of the manufacturing process should be done. Hazards like anti-biotics in farmed fish/shrimps presence of heavy metals, biotoxins, pesticide residues should also be considered while identifying the hazard.

29.3 Methods for monitoring and checking such critical points shall be established and implemented.

29.4 There shall be separate qualified and experienced technologists for conducting laboratory analysis and for carrying out own checks to comply with requirements of Government of India Notification.

29.5 The establishment/factory vessel should keep written records in an indelible fashion for submission to the competent authority. The results of the different checks and tests will be maintained at least for a period of 2 years.

29.6 The establishment shall have adequate number of competent and qualified technologists duly approved by the competent authority to conduct own checks and allied duties.

29.7 The persons responsible for handling, processing and testing of fishery products shall possess one of the qualifications and experience/training as the case may be:

i) Graduate/Post Graduate in Fishery Science, Fishery Management, Industrial Fisheries, Fish Processing or Food Processing Technology.

ii) A) Graduate/Post Graduate in Marine Biology, Fishery Biology, Microbiology, Chemistry, Zoology, Biology, Biochemistry or Bio-science, and

B) One year's experience in Fish Processing and Quality Control or Training for a minimum period of 6 months in a Govt. recognized institute in Fish Processing and Quality Control.

29.8 If the results of own checks or any other information available with the persons responsible as referred to above reveal the risk of health hazard or suggest that such risk might exist, appropriate measures shall be taken under official supervision of the competent authority.

30. Any statutory restrictions imposed by the State or Central Government or local bodies with respect to commercial/environment/conservation measures from time to time shall be adhered to.

Annexure 11: Checklist for maintaining standards in the EU-approved processing plant (Source: Dr S S Gupta, CIFT, Vizag)

By Industry

1. Water Testing as per EEC 80/778 – EEC once in a year – regarding Table D & E once in 4 months
2. Industry to lay down the frequency of testing for MRLs as per S.0792 (E) dated 17.8.2001 and implement the same
3. Chloromphenicol for aquaculture products shall be tested for entire products
4. Pollution control certificates to be valid
5. Raw material test requirements
6. Importing countries requirements may also be taken into consideration
7. Records for pre-processing should be maintained and there should be traceability
8. Hygiene and sanitary conditions
    - Medical health certificates for the workers
    - Change rooms –
        i. Street clothes & working clothes to be kept separately
        ii. No of lockers should be as per workers shiftwise
    - Foot dip to be functional
    - Chlorination (exact chlorination value at all points)
    - Ortho-Toludene method to be used and available
    - Temperature recording device to be functional in cold storage/chill room
    - Log book of freezers maintained
    - Gauges to be functional
    - Anteroom to be in good condition
    - Alarm bell in cold storage to be working
    - Flake ice and block ice should be hygienically manufactured
    - There should be no rusted work surface
    - Cleaning/maintenance schedule to be laid down and implemented
    - Personal hygiene of the workers to be given specific attention
    - Vermin/Pest control measures to be in place
    - Storage of chemicals/wet and dry to be separate
    - Fly control measures such as air curtains to be in place
    - Self-closing door mechanisms in order
    - Foot operated bins in order
    - Surrounding of the premises to be clean
    - Waste disposal method to be hygienic
    - Toilets to be clean
    - Foot operating taps at all points to be in use
    - Single use towels and soaps to be in use
    - Workers should not enter directly to processing hall but through change rooms
    - High risk/low risk areas – separate change rooms
    - Lighting in work areas to be adequate
    - Receiving areas to have a raised platform

- Footgear/headgears should be provided to all workers
- Signboards should be suitably displayed

9. Health certificates to be issued as per the laid down procedures
10. Complaint procedures
11. Documentation/Training records available in the industry
12. Freezer vessels – Maintaining of freezer vessels – probable schedule of their berthing
13. Laboratory equipment to be functional and calibrated – all chemicals and media to be available
14. Own checks/HACCP records to be clearly maintained

By EIC/EIAs

15. Supervisory visits
16. Inter and intra laboratory calibrations
17. Checking of all records

By CIFT

18. Testing by CIFT as per guarantees

Annexure 12: List of US Approved firms in Andhra Pradesh (from www.mpeda.com/)

LIST OF FIRMS WHOSE FRESH, FRESH FROZEN SHRIMP ARE EXEMPT FROM AUTOMATIC DETENTION

NAME AND ADDRESS		DATE
Balaji Bio-Tech Limited Thupillipalem Village Vakadu Mandal, Nellore, 524427 India		6/12/96
Choice Canning Company Division of Choice Trading Corp. Ltd. Indukurpet Mandal, Jegadevipet Nellore, India		5/3/94
Coromandel Fisheries Pvt., Ltd. Kakinada, India		
Devi Sea Foods Limited Singarayakonda B 523101 Prakasham District Andhra Pradesh, India	Fresh Frozen Shrimp	8/9/99
Indus Food Lmt. (Packer) Pamarru 521 157 AP (Andhra Pradesh), India		7/27/93
Innovative Marine Foods Kurumaddal, Pamarru Krishna District Andhra State, India		8/21/95
Swarna Sea Foods Limited 20 Vijayanagar Place Layout Pedawaltai Visakhapatnam India		6/26/97
Wellcome Fisheries (P) Limited Vandram Village, Undi Mandalam, 534201 Andhra, Pradesh, India	16X21, 16J05	7/7/99
DCL Maritech Ltd Nellore		2/7/00
Attachment B - 4/9/99 **LIST OF FIRMS WHOSE COOKED SHRIMP ARE EXEMPT FROM AUTOMATIC DETENTION**		
Minota Aqua Foods Ltd.* Name change 4/9/99 Vemulavalasa P.O. Visakhapatnam, India	Frozen Cooked Shrimp 16J05	10/23/97
Jasper Aqua Exports Ltds. (Formerly Minota Aqua) Vemulavalasa Anandapuram Mandal Visakhapatnam 531-163 Andhra Pradesh, India	Frozen Cooked Shrimp 16J--05	10/23/97