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Trends in poverty and livelihoods in coastal fishing communities of Orissa State, India

Cover photo:
Woman headloader in Pentakota, Puri, carrying fish from the landing centre to fish collection points/Amalore

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Preparation of this document

This publication on poverty, food insecurity and vulnerability in coastal fishing communities of Orissa presents the findings of studies carried out in the framework of the FAO-Netherlands Partnership Programme (FNPP) managed by the Support Unit for International Fisheries and Aquatic Research (SIFAR) of the Food and Agriculture Organization of the United Nations (FAO) and executed by Integrated Coastal Management (ICM), Kakinada, Andhra Pradesh, India.

The study was conducted during 2003 in 18 locations representing the six coastal districts of the Indian State of Orissa in close cooperation with the Department of Fisheries of the Government of Orissa and non-governmental organizations working with fishing communities in the coastal belt of the state. The text of this publication was written by Venkatesh Salagrama and edited by Lynn Ball.

Abstract

This study analyses the livelihoods of marine fishing communities in the Indian coastal state of Orissa using the Sustainable Livelihoods Approach (SLA). It investigates the relationships between livelihoods and coastal poverty and seeks to develop simple qualitative indicators to monitor the changes in these relationships over time.

The key trends affecting the livelihoods of the poor in the coastal fishing communities in Orissa range across the whole spectrum of "assets" – i.e. the natural, physical, social, human and financial – and contribute to changes in terms of availability as well as access to the assets for the poorer stakeholders. Thus, the overall decline in availability of fish from the coastal waters is also accompanied by a declining access of the poor to the fish resources as a result of changes in fishing technology and in market supply chains. The shift in fishing methods from subsistence-based artisanal activities to sophisticated modern technologies has rendered redundant the traditional skills, knowledge and manual labour abilities of the poor, while also increasing risks and leading to a dependence upon external sources of credit. As fish are sold directly to the traders at the point of landing, fishermen no longer depend on the women to sell them, so the women find themselves marginalized. Apart from the factors having a direct bearing upon fisheries-based livelihoods, there have also been changes affecting the quality of life generally, which contribute to, or arise out of, changes in the livelihood patterns and span across the social, political, cultural and economic spheres of life. "Social capital", which is the glue that held together the traditional fishing communities and provided some sort of social security to the vulnerable groups (the aged, widows), has become much weakened. There is evidence that food insecurity is growing in the fishing villages and, coupled with the weakening of the welfare state policies, leading to increasing deprivation.

Apart from the various trends, this paper examines the impact of seasonality and shocks upon the fisheries-based livelihoods and the importance and the influence of various policies, institutions and processes in addressing the fishers' need to cope with their vulnerability context in a meaningful manner. It summarizes the various factors having an impact upon the livelihoods of the fishers and develops them into simple indicators relevant in assessing the changing patterns of poverty in fishing communities of Orissa. The indicators could range from a household's seasonal dependence on credit for consumption purposes to more straightforward ones like having a single woman as the head of the household. Simple indicators like residence in a thatched hut or lack of access to secure toilets can also determine the extent of poverty. The indicators necessarily transcend sectoral and disciplinary boundaries and aim to provide a holistic and integrated picture of poverty. On the other hand, poverty is an outcome of a wide range of factors, so deciding the extent of poverty based upon any single indicator can be misleading. At the simplest level, the poorest can be categorized as people whose livelihoods reflect the widest number of negative indicators. There are many intermediate levels between the poorest and the wealthy, which can be captured by the relative proportion of different indicators in each case. At the same time, each indicator is multidimensional and subsumes differences in depth and severity, and not all indicators carry equal weight, so mere counting of the numbers of indicators is not sufficient by itself to obtain a clear picture. There is a need for more work to ensure that each indicator is combined with other key variables to develop composite indices of poverty and deprivation.

Venkatesh, S.
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FAO Fisheries Technical Paper. No. 490. Rome, FAO. 2006. 111p.

Contents

Acronyms and abbreviations

BLC	Beach landing craft
BOBP	Bay of Bengal Programme (FAO)
BPL	Below the poverty line
CMFRI	Central Marine Fisheries Research Institute
CPDA	Coastal People's Development Association (NGO based at Konark)
CPR	Common property resources
CRSP	Centrally-Sponsored Rural Sanitation Programme
CRZ	Coastal regulation zone
CSG	Community stakeholder group
DES	Department of Economics and Statistics
DFID	Department for International Development (United Kingdom)
DOF	Department of Fisheries
DOSC	Department of Soil Conservation
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FFW	Food for Work
FNPP	FAO-Netherlands Partnership Programme
FRP	Fibre-reinforced plastic (fibreglass)
GDP	Gross domestic product
HACCP	Hazard Analysis and Critical Control Point
HSD	High-speed diesel
IAY	Indira Awaas Yojana (Government of India housing programme for weaker sectors)
ICM	Integrated Coastal Management
IIM	Indian Institute of Management
JFM	Joint forest management
LPG	Liquid petroleum gas
MPEDA	Marine Products Export Development Authority
MSSRF	MS Swaminathan Research Foundation
NABARD	National Bank for Agriculture and Rural Development
NAC	Notified Area Council
NBFC	Non-banking financial company
NCDC	National Cooperative Development Corporation
NDWM	National Drinking Water Mission (later renamed Rajiv Gandhi NDWM)
NFPE	Non-formal primary education
NGO	Non-governmental organization
NIRD	National Institute of Rural Development
NSS	National Sample Survey Programme
OAL	Overall length
OMFRA	Orissa Marine Fishing Regulation Act
PDS	Public Distribution System Programme
PHFP	Post-Harvest Fisheries Project of the Bay of Bengal Programme (funded by DFID)

PRA	Participatory rural appraisal
PSG	Poor stakeholder group
RRA	Rapid rural appraisal
SHG	Self-help groups
SIFAR	Support Unit for International Fisheries and Aquatic Research
SLA	Sustainable livelihoods approach
SLF	Sustainable livelihoods framework
TED	Turtle excluder devices
UAA	United Artists Association
XIM	Xavier Institute of Management

Conversion rates (*The Hindu*, 13 November 2003)	
1 US$	Indian rupees (Rs) 45.15
1 UK£	Rs75.50
1 €	Rs52.35
Denominations:	
1 Lakh	100 00
1 Crore	10 000 000

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This study was carried out under the FAO-Netherlands Partnership Programme (FNPP), managed by the Support Unit for International Fisheries and Aquatic Research (SIFAR) of the Food and Agriculture Organization of the United Nations and implemented by Integrated Coastal Management (ICM), a coastal development management firm based on the east coast of India. The study was conducted in the eastern coastal state of Orissa in India in two phases during January-June 2003. In the first phase, detailed field studies were carried out at eight locations. Findings from this phase were validated in the second phase in 18 locations covering the six coastal districts in the state. The study findings were documented in the form of five working papers, summarized in this report.

The study owes a great deal to several institutions and individuals, who made significant contributions in terms of information, viewpoints, experiences and ideas. United Artists' Association (UAA), a non-governmental organization (NGO) in Ganjam district of Orissa was an active collaborator in the research. The Department of Fisheries, Government of Orissa, and the NGOs Gram Utthan in the northern zone, MS Swaminathan Research Foundation (MSSRF) in the central zone and the Coastal People's Development Association (CPDA) and Pencode in the southern zone assisted in conducting the field studies.

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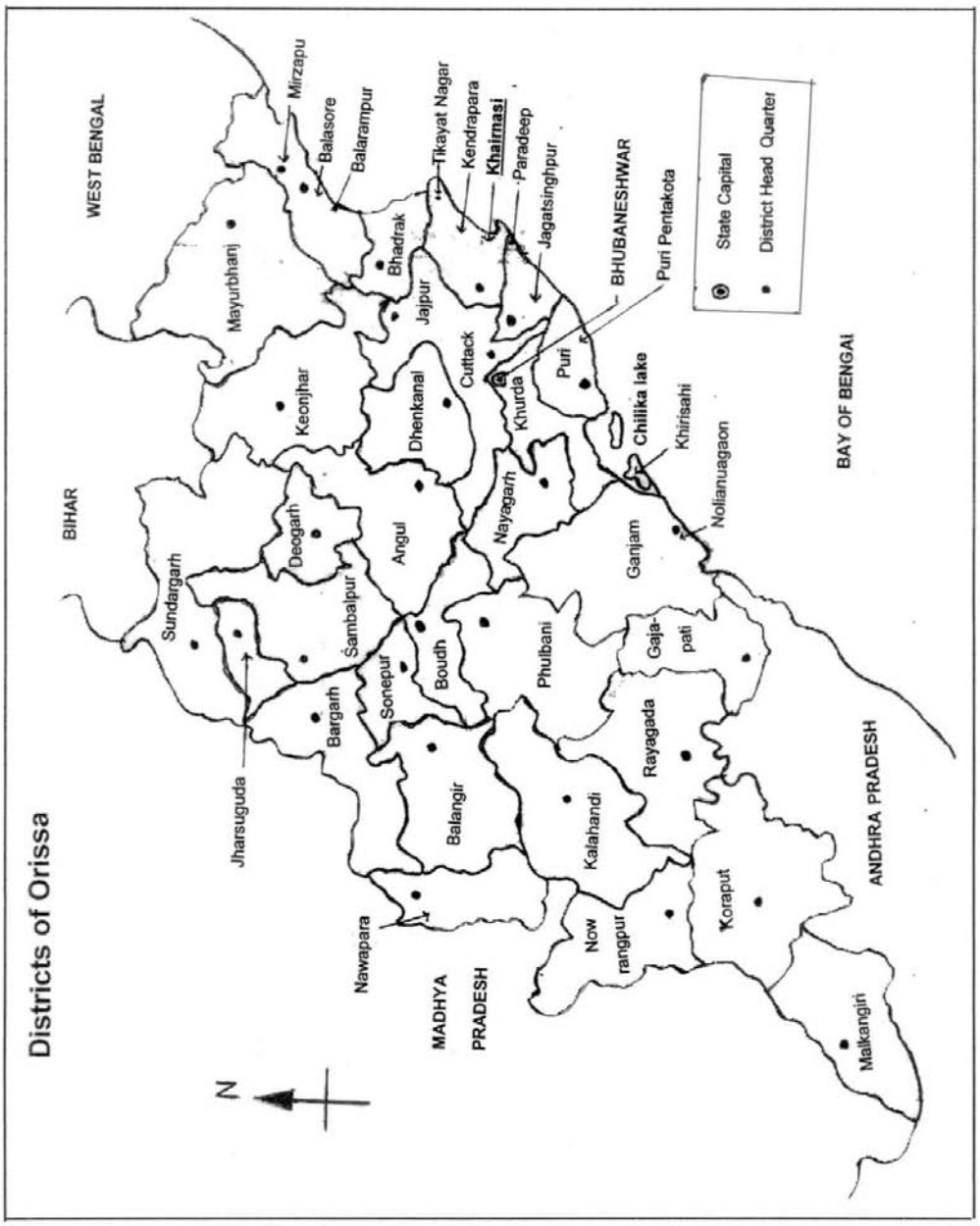
- finally, to Dr Uwe Tietze of FAO, but for whose interest and initiative to publish this text as a technical report, the study would perhaps have remained unpublished.

Venkatesh Salagrama


Districts of Orissa
WEST BENGAL
BIHAR
MADHYA PRADESH
ANDHRA PRADESH
BAY OF BENGAL
BHUBANESHWAR
Chilika lake
Mirzapu
Balasore
Balarampur
Tikayat Nagar
Kendrapara
Khairmasi
Paradeep
Jagatsinghpur
Puri Pentakota
Mayurbhanj
Bhadrak
Jajpur
Cuttack
Khurda
Puri
Keonjhar
Dhenkanal
Angul
Nayagarh
Khirisahi
Nolianuagaon
Ganjam
Deogarh
Sundargarh
Sambalpur
Boudh
Phulbani
Gaja-pati
Bargarh
Sonepur
Rayagada
Jharsuguda
Balangir
Kalahandi
Nawapara
Now rangpur
Koraput
Malkangiri
State Capital
District Head Quarter
N

Executive summary

The Food and Agriculture Organization of the United Nations commissioned Integrated Coastal Management (ICM) to undertake a case study to assess the poverty, food insecurity and vulnerability of artisanal fishing communities in the eastern coastal state of Orissa in India. The study was conducted from January to June 2003, using secondary data sources and participatory field research in 26 coastal fishing villages in the state.

The study's objectives were to:

- analyse the trends, using a participatory approach, that have impacted the lives and livelihoods of different stakeholders in the coastal fishing communities in terms of poverty, food insecurity and vulnerability, and develop simple indicators to monitor them periodically;
- develop a usable methodological framework to facilitate periodical monitoring of the impacts of future changes – including development initiatives – affecting the poverty and livelihoods of coastal fishers, with a view to its application in similar studies elsewhere.

METHODOLOGY OF THE STUDY

Fishers in the state are not homogeneous – a number of critical factors distinguish one group from another. And yet they share two important features: they are all heavily dependent on fishing as a livelihood and a large majority of them are poor, suggesting that most of the troubles that afflict fishing communities are directly attributable to the poor conditions of their livelihoods.

The research was thus structured around an analysis of fishing livelihoods through the sustainable livelihoods framework, which is a useful tool in the holistic investigation of links between livelihoods and poverty and between the poor and the larger context of their livelihoods.

The study emphasized the need to develop indicators from the perspective of poor stakeholders, not only because of the paucity of secondary data, but also due to the recognition that the poor have the best understanding of the factors affecting their livelihoods, and any meaningful and workable indicators must be developed with their participation.

It included a literature review and mechanisms for keeping institutional stakeholders informed and regularly involved in the field studies. The aim was to ensure that the outcomes of the study would help fill gaps in existing knowledge and feed more readily into current policy processes. The literature review also provided useful points of reference and analysis.

The study followed a tiered approach – from institutional stakeholders at the state level to poor households at the village level – through which the emerging livelihood analysis was progressively validated in successive stages. The literature review and meetings with secondary stakeholders, followed by intensive field studies in eight villages, provided a range of key livelihood issues. These in turn were developed into a set of indicators for validation in a larger sample of villages using a range of participatory tools.

LIVELIHOOD GROUPS IN THE FISHERIES SECTOR

The fisheries sector incorporates a diverse range of livelihood activities, from production and processing to marketing and ancillary functions, but many of the people engaged in these activities remain unrecognized as fishworkers. This is a serious situation, as a majority of these people are very poor and extremely vulnerable. No information exists

on their numbers, geographical spread, socio-economic status and function, resulting in poor policy responses to their needs and a failure to predict possible impact on these groups from policies targeting other people within and outside the sector.

LIVELIHOOD ANALYSIS

Livelihood vulnerability

The development of Indian fisheries over the last 50 years has resulted in the superimposition of a modern, capital-intensive, specialized technology on the existing traditional base, which was largely labour intensive and of great technical diversity. The result is that community-based, small-scale fishing has given way to production based on industrial principles of organization and complex technology in order to feed international markets.

In sustainable livelihood terms, the fisheries sector in India developed largely on the principle of enhancing *physical* assets to maximize returns from the exploitation of *natural* assets. Any attention paid to the development of other assets – social, human or financial – was in terms of enabling the acceptance of the physical assets. Thus the signs of fatigue in the natural resource base speak not only of the failure of the techno-centric model of development, but also of fishers' abilities to cope with this model.

Traditionally, marine fishing was a communal activity, with each member contributing to the effort in kind. There has been a shift in fishing operations from subsistence-based artisanal occupations to profit-oriented business transactions, and this has rendered redundant the traditional skills, knowledge and manual labour abilities of the poor – their most important assets.

It is the open-access or common property nature of the sea that attracts large numbers of poor people to find their livelihoods there, and they are badly affected when the terms of access to the resource change. Open access allows the entry of bigger players into the sector, which come to dominate or even monopolize access to resources – often with the facilitation of the state – and marginalize traditional stakeholders.

Development efforts have given rise to a hierarchy based on economic criteria in the villages. The diffusion of new technologies has benefited a few people, with the large majority becoming wage earners and several others becoming redundant. Changes in marketing patterns brought about a change in sharing patterns, transforming fishing crew from shareholders to employees, although they still retain a share in the catches.

Modern systems have introduced a number of new players and reduced access to fish for many traditional users, including the producers. Increasingly, trader-financiers from outside the community have come to wield considerable power in the sector.

There was a clear division of labour between men and women in the southern zone, where women were involved in selling fish. As fish are increasingly sold directly to traders at the point of landing, fishers no longer need to depend on their women for the sale. This has had an impact on the well-being of the household. Single women in the fish trade are the worst affected by these changes.

Outsider interest in the fish catches has introduced a system of advances. This has led in turn to monetization of transactions, and many social activities have become paid jobs. Speculative credit linkages, in which the amount of credit is much higher than the net asset worth of the borrower, has made fishing unviable and led to a sense of fatalism among all stakeholders.

Modern technology in fishing has resulted in overcapitalization. It has increased risk and made boat owners very selective in their operations, concentrating efforts on expensive varieties of fish to the point of overexploitation, while cheaper varieties are ignored.

Major changes include the arrival in the villages of trader-financiers, Panchayati Raj institutions, bureaucrats, NGOs, mass media and literacy have undermined traditional

systems of community-based management. There are indications that this has had a detrimental effect on the livelihoods of fishers, as well as on the natural resources that underpin them. The weakening of customary systems has particularly affected old people and widows, who received some insurance from these systems.

The single factor most responsible for the increasing levels of poverty, food insecurity and vulnerability in fishing communities is the steep decline in availability of fish in terms of quantity, quality and variety over the last decade. The seasonal availability of different varieties of fish has become uncertain. Increased population and market demand on the shore have resulted in the spreading of catches more thinly across a larger number of people and/or increasing prices to very high levels and thereby reducing *access* to fish.

For many stakeholders, the current level of wages or earnings from fishing and trade leaves very little surplus. Even those households that generate some surplus use it up during the lean periods or for ongoing production and consumption needs. A majority of fishers are perpetually indebted.

Borrowing during lean periods has come to constitute a livelihood strategy for many people. This 'borrowing from tomorrow' may occur through pawning productive assets, jewellery or family utensils, entering into trade agreements for next season's catches or removing children from school to put them to work.

International quality regulations have forced the seafood industry in Orissa to undertake process improvements at all stages of production, necessitating a reorientation of production, processing and trading systems and an upgrading of infrastructure. Systems have become more *formal*. This trend might lead to the marginalization of large numbers of stakeholders, because it is the *informal* nature of fishing activities that enables a large number of the poor to make a living from them.

Geographical and occupational migration by fishers in search of a livelihood is increasing, and much of this burden falls on women. With reduced earnings and increasing unemployment in the sector, more women are actively seeking employment elsewhere. A sizeable proportion of the income in many households comes from women's earnings in agriculture, port operations, the hotel industry, household labour, construction and plantation work.

The fishers' choice of a new livelihood is not random, but is decided after a careful weighing of available options. The choices they make are often the best under the circumstances. But the problem of poor and unsustainable livelihoods persists and is growing rapidly, indicating that fishers are increasingly unable to find adequate solutions to their livelihood requirements.

The need for alternate livelihood generation is widely recognized, and there have been many efforts by government and NGO sectors to address this issue, but they fall short of offering meaningful solutions.

By making equity secondary to growth, fisheries policies have failed to foster and nurture the livelihoods of the poor. Formal credit systems, for example, were established with developmental motivations, but have proved unsuccessful because of their failure to adapt themselves to the unique conditions of the fishing sector. The record of cooperatives in fisheries is not very encouraging and their role in improving the lives of fishers has been limited.

Conservation and management programmes are often implemented without taking into account the needs or opinions of the people dependent on the resources. This approach has resulted in criminalizing fishers' livelihoods and forcing them to violate laws. The policies and functions of various line departments are not always harmonized or coordinated, and duplication of effort or contradictory approaches abound.

Fishers' encounters with governmental agencies for any purpose, whether to receive support, evade repayment of past loans, violate a ban, receive health-care services or even obtain a death certificate are influenced by their ability to pay some form of bribe or commission. Such widespread corruption leads to a deep cynicism about the whole

system and the belief that anything is possible for anybody as long as s/he can bribe generously.

Meanwhile, various research, development and academic institutions that work on fishery-related issues have had very little direct relevance to the lives and livelihoods of the majority of stakeholders, who are often completely unaware of their existence and functions.

Political patronage plays a role in determining fishers' ability to access external support. The selection of beneficiaries for government assistance programmes depends on the potential services – economic, social or political – that beneficiaries can provide to the village elders that serve as intermediaries in programme implementation. This subjects beneficiaries to a different kind of bondage.

Poverty, food insecurity and vulnerability

The *geographical isolation of fishing communities* has a strong bearing on their poverty and vulnerability and is reflected in their limited access to infrastructure and development assistance, poor transport and communication systems, alienation, extreme poverty and vulnerability to natural disasters.

The *poverty of fishers* is reflected in their substandard housing and sanitation systems, their meagre access to basic amenities such as clean drinking water and health care, and inadequate transport services.

In the fishing sector, poverty and food insecurity are determined not so much by the prevalence of seasonal unemployment as by the ability of different sectors of fishers to cope with it. Food insecurity is primarily a seasonal feature and leads to a host of other maladies.

While northern-zone fishers appear to be more food secure compared to their southern-zone brethren, this is changing for the worse as the former find their current livelihoods coming under threat. While in the southern zone, people go completely hungry during lean periods, food insecurity in the northern zone takes the form of people resorting to cheap or not-so-healthy food to survive.

One key trend is that fishers cannot afford to eat the fish they catch. The fish species that were traditionally consumed have become so expensive that fishers consume cheaper varieties, which are often purchased from markets. Most fishers consume fish less often than in the past.

The prevalence of diseases related to hunger and malnutrition is high in fishing villages, and the problem becomes more serious during the 'hunger' months (monsoon period). Food insecurity becomes particularly intense in times of natural disasters.

Intrahousehold differences in access to food exist; they take the form of differences in variety, quality, quantity and frequency of food intake.

There is a clear correlation between the number of working days a family reports and its food security, leading to pronounced irregularities in patterns of daily consumption of various foodstuffs. Poor households spend large shares of their income – from 40 to 60 percent and occasionally up to 80 percent or more – on meeting their food needs.

Many fisher families depend on the Public Distribution System for their food supplies. However, its supply of essential commodities has decreased through the 1990s, and the gap in prices between the open market and the system has narrowed to become minimal.

Many diseases are attributable to the unsafe, unhealthy and unhygienic working and living environment of fisher families, and to their poor health-care facilities. Early marriages, large families and alcoholism contribute to poor health. The government health-care systems, though beset by many problems, are still the most important source of health care for the people.

Although literacy rates in coastal villages continue to be below those for their respective districts and below the national average, many fishers – particularly women –

have begun to take an active interest in education and are sending their children to school.

There has been a disruption of joint family systems, with precarious implications for the condition of old people, who are largely left to fend for themselves. There are also a growing number of destitute families, composed of people too old and infirm to undertake any productive activities.

'Retired' fishworkers who have little or no savings and no one to take care of them are among the worst affected by globalizing economic trends. Many now depend on charity or resort to begging.

Migration is intrinsic to the marine fishing sector, and the fishing communities have made remarkable adaptations to it. Marine fishing in Orissa is mostly carried out by permanent settlers from Andhra Pradesh, West Bengal and Bangladesh and by seasonal (short-term) migrants. However, the different geographical and linguistic origins of different fishing groups limit somewhat their access to resources.

For fishers, caste has traditionally provided a form of protection of their livelihoods, but it has also constituted a barrier to diversification. Caste also becomes relevant in helping fishers gain access to development assistance.

The formation of women's self-help groups (SHGs) by the Government and NGOs has been a positive step. These initiatives have taken a holistic, participatory and integrated approach to community institution-building and have begun to yield encouraging results, although they still have some way to go before they can fully attain their objectives.

Fishers are constantly exposed to various kinds of shocks and crises, from cyclones, floods and accidents at sea to trawlers overrunning their fishing nets, conflicts with neighbouring agrarian communities, failure of fishing seasons, glut landings or arrival of large quantities of fish from distant markets, bans on fish trade imposed by public health departments, strikes, fluctuation in international demand for or prices of Indian seafood, or spread of epidemics and fire accidents. Even routine events such as births, deaths, marriages and illnesses can frequently diminish or wipe out the savings of a family.

INDICATORS TO MONITOR CHANGES IN LIVELIHOODS OF COASTAL FISHERS

The key issues arising from the livelihood analyses are consolidated into simple indicators that can be used to assess the impact of change on the livelihoods of fishers. Obviously, poverty is an outcome of a wide range of factors, so deciding who is poor based upon any single indicator can be misleading. At the simplest level, the poorest can be categorized as people whose livelihoods reflect the widest number of negative indicators, while the more affluent have the fewest negative indicators. There are many intermediate levels between the poorest and the wealthy, determined by differences in the numbers of indicators examined. However, each indicator is multidimensional and subsumes differences in depth and severity, and not all indicators carry equal weight, so it will not suffice to confine the exercise to a mere counting of numbers of indicators in each case.

In addition, some of the indicators – e.g. dependence on open-access resources – are not specifically applicable to the poor alone. However, when taken in conjunction with a range of other features, such as access to and availability of assets, levels of vulnerability, and support obtained from policies and institutions, such an indicator can constitute an important determinant of poverty. Thus these indicators can be combined with other key variables to constitute composite indices of poverty and deprivation.

Indicators of this type were summarized and grouped into two categories: those relevant at the village/sectoral level and those relevant at the household level. Using these indicators to develop composite indices of poverty, vulnerability and food insecurity, it would be possible to: (i) understand the status of a household in terms of absolute and relative poverty at any given time; and (ii) assess the impact of livelihood

changes in improving or worsening their overall quality of life. This latter goal would require periodic assessments. These indicators also permit categorization of people into socio-economic strata based on differential access to assets and resources.

The importance of these indicators lies in the fact that they were proposed and validated by the fishing communities in which the research was conducted. They summarize the issues that fishers themselves regard as important in determining their poverty. This study has attempted to make the research process as simple and transparent as possible, by using participatory tools and methodologies to collect data and by taking the household/community into its confidence.

CHAPTER 1

Introduction and methodology

LIVELIHOODS AND POVERTY

Fisheries-related activities provide important sources of livelihoods for nearly 7 million people in India (Government of India, 2000). A large percentage of fishers are involved in artisanal, small-scale fishing operations in open water bodies including the sea, rivers and creeks, as well as in fish trading, processing and related activities. Poverty in coastal areas often tends to be more relative than absolute and thus not always easily apparent, giving rise to the notion that coastal areas have fewer poor people than non-coastal areas. Based on the definition of poverty as the inability to secure a minimal standard of living (National Institute of Rural Development – NIRD, 1998: 5), the majority of coastal fishers can be defined as poor. In fact, the nature of their livelihoods and their living conditions make them one of the poorest and most marginalized groups in the country.

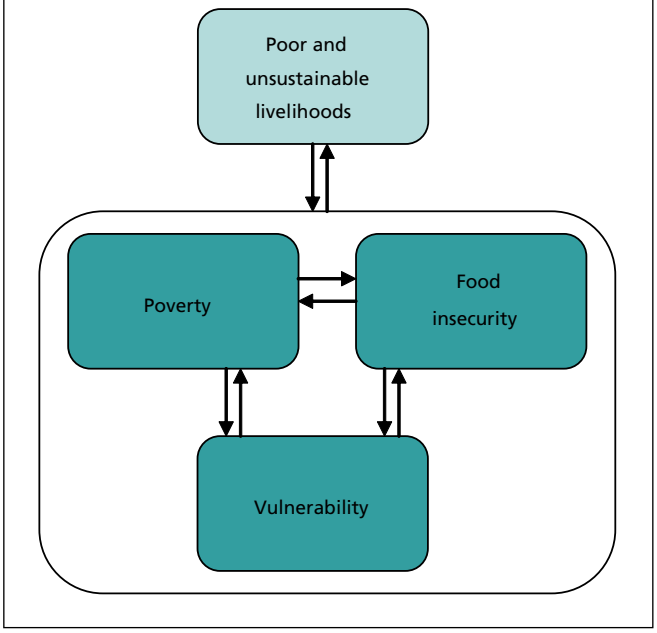
According to Chambers and Conway (DFID, 1998), a *livelihood* "comprises the capabilities, assets (including both material and social resources) and activities required for a means of living". A livelihood is *sustainable* when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets, both now and in the future, without undermining the natural resource base. Following this definition, there is substantial evidence to demonstrate that the livelihoods of the coastal fishers are becoming increasingly *unsustainable*.

Over the last quarter century, changes in the fishing sector have increased at a faster pace than fishers' ability to keep up with them. Their livelihoods have been affected by a wide range of factors, including: (i) declining access to and availability of fish resources; (ii) increasing competition for fishing grounds and in the marketplace; (iii) overcapitalization of fishing and post-harvest activities; and (iv) macroeconomic factors that undermine the traditional structures and mechanisms that used to protect fishers' livelihoods. There is a need to understand many of these changes as manifestations of particular policy frameworks within which the development and management programmes have worked. These include the process of policy-making, the way in which policies were translated into programmes, their implementation and their monitoring and evaluation. As a result, the livelihoods of coastal fishers are becoming progressively inefficient, unsustainable and weak. Fishers find their security of existence[1] under threat and their ability to meet the basic needs of life eroding. In other words, their poverty is *increasing*.

The problem is exacerbated by the growing vulnerability of fishers to natural disasters, which are increasing both in frequency and intensity. Calamities such as the 'super cyclone' of 1999, which devastated large parts of coastal Orissa, are serious problems, not only because of the toll they take in human lives, but (often more seriously) because of the damage they cause to the productive assets of a community and to their long-term livelihood security. An extremely urgent issue affecting coastal fishing communities is the rapid spread of AIDS, which has repercussions on

[1] Security of existence in this context means the opposite of vulnerability and involves assured and sustainable access to food and social and economic security for people of all classes, castes, occupational groups, ages and genders in a community. It enables them to confidently surmount the negative impacts of trends, shocks and seasonality.

FIGURE 1
Linkages among livelihoods, poverty, food insecurity and vulnerability



livelihoods as well as on health. While food insecurity might be an outcome of many factors, it is poverty that contributes most significantly to the food insecurity of fishers. Given that poverty in turn stems from poor livelihoods, it can be argued that food insecurity is ultimately an outcome of poor livelihoods. Food insecurity is also clearly linked to seasonality and to the periodic shocks that fishing communities face. A review of the coping strategies used to overcome food insecurity indicates that these shocks invariably lead to a weakening of the asset base of fishers. So, while poverty is a major cause of food insecurity, the reverse is also equally valid.

The *vulnerability* of current livelihood systems in the coastal fishing sector, then, is both the cause as well as the outcome of the *poverty* and *food insecurity* that characterize their livelihoods. The persistence of this cycle is due to the poor asset base of fishers as well as to the failure or inadequacy of policy responses (Figure 1).

Fishers' vulnerability stems from their inability to cope with changes to their livelihoods using the means accessible to them. That poverty in fishing communities is directly related to their livelihoods can be deduced from the fact that the coastal fishers in Orissa, who are characterized by great diversity in terms of geographical and linguistic affiliations, social and cultural systems and degrees of access to formal institutions and processes, are *uniformly* recognized as one of the poorest groups in the state.

The impacts of changes in the lives and livelihoods of fishers are only dimly understood, with the result that policy responses have failed to address poverty, vulnerability and food insecurity in an effective and meaningful manner. Moreover, poverty and vulnerability are dynamic conditions that keep shifting within groups and even for individuals, adding to the complexity of the problem. While there is a general recognition of the increasing vulnerability of artisanal fishers at different levels of policy-making and implementation, there is also a need for disaggregated information on poverty at the subnational level in order to better address the issues and to improve targeting of the poor.

In this context, the Food and Agriculture Organization of the United Nations (FAO) commissioned Integrated Coastal Management (ICM) to undertake a case study in India to assess the poverty, food insecurity and vulnerability of artisanal fishing communities in the eastern coastal state of Orissa. The study was conducted by a multidisciplinary team of researchers over the period February–June 2003, using secondary data sources and participatory field studies in 30 coastal fishing villages.

OBJECTIVES OF THE STUDY

The study aimed to:

- analyse the trends, using participatory methods, that have impacted the lives and livelihoods of different stakeholders in the coastal fishing communities in terms of poverty, food insecurity and vulnerability, and develop simple indicators to monitor them periodically; and

- develop a usable methodological framework to facilitate periodical monitoring of the impacts of future changes – including development initiatives – affecting the poverty and livelihoods of coastal fishers, with a view to its application in similar studies elsewhere.

APPLICATION OF THE SUSTAINABLE LIVELIHOODS APPROACH

Once it was established that livelihoods were the central issue to be explored, the structure of the research was built around the sustainable livelihoods framework (SLF) as defined by the Department for International Development (DFID) of the United Kingdom (Box 1 and Figure 2).

The coastal ecosystem is complex, and this is reflected in the intricate interrelationships between people and the ecosystem and in the plurality of sectoral affiliations that a poor coastal household generally maintains. At another level, the complexity of the coastal context derives from the multiplicity of players and interests that are often in competition with one another for its resources. Thus, any study dealing with the interactions between coastal ecosystems and livelihood systems will necessarily involve a holistic and multidisciplinary approach.

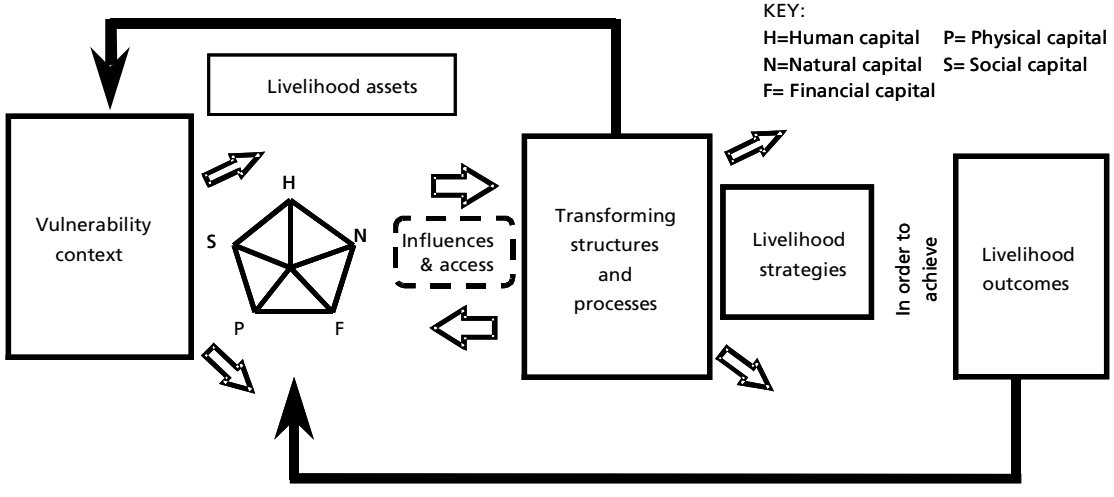
Recent analyses of the livelihood systems in artisanal fishing communities on the east coast of India provide some useful insights into the causes and consequences of changes in external factors, as well as of the changing access to different assets (health,

BOX 1
Sustainable livelihoods framework

"In its simplest form, the framework views people as operating in a context of vulnerability. Within this context, they have access to certain assets or poverty reducing factors. These gain their meaning and value through the prevailing social, institutional and organizational environment. This environment also influences the livelihood strategies – ways of combining and using assets – that are open to people in pursuit of beneficial livelihood outcomes to meet their own livelihood objectives."

DFID Sustainable Livelihoods Guidance Sheets (1.1)

FIGURE 2
Sustainable livelihoods approach – thematic diagram



education, drinking water, etc.), for poverty, marginalization, vulnerability and food insecurity. Using the sustainable livelihoods approach (SLA), it has been possible to derive indicators to understand the complex dimensions of the vulnerability context at and within different levels of the community – livelihood group, family and individual.

By highlighting the differences within a reputedly homogeneous system, in which different individuals have different modes and levels of access to various assets, SLA makes it possible to understand the hierarchies of caste/class, occupation, gender, place of origin and age that determine poverty and vulnerability. By putting the livelihoods of the poor at the heart of the framework, this approach helps us examine the influence and impact of policies from the perspective of their recipients, i.e. fishers. Making the poor the primary informants allows researchers to overcome the sectoral bias that is often implicit at the secondary stakeholder level. It also allows them to explore issues that at first glance may not appear to have direct relevance but on closer inspection prove to have more significance than many direct policies and programmes.

Thus, at one level, SLA is a generic tool for understanding livelihood systems, but at another level, it can also reveal the special features that distinguish the conditions of every poor individual. By making it possible to undertake studies at regular intervals, the SLF also allows us to capture the ever-changing picture of poverty and vulnerability in fishing communities in a way that can readily determine the causes and consequences of change, thereby directly contributing to policy-making and implementation. For more details concerning the SLF, see www.livelihoods.org.

METHODOLOGY

An important consideration when undertaking the study was the necessity of obtaining strong participation by the fishing communities. Every community generally possesses some idea of what constitutes poverty and who the poor are. With changes in access to different assets over time, the criteria that are used to determine poverty itself change, as does the categorization of specific sectors or groups of people as poor. This shift in perceptions is a very good indicator of the effectiveness of policies, and to understand this shift, a clear baseline of information is necessary. The best way to obtain this is by involving the primary stakeholders – i.e. fishers – in assessing the policies. Suitable means must be devised to make their participation in the dialogue meaningful.

Major gaps in secondary data, and in how institutional stakeholder groups understand poverty, supported the need to involve fishers in the process as the main stakeholders. They were actively involved in validating the information drawn from secondary sources, from institutional stakeholders and in generating new information and insights into the structures, systems and processes impacting their livelihoods. Their first-hand experience of these realities was used to facilitate analysis of the issues that emerged.

The study had two components: (i) a theoretical aspect addressing the systemic complexity that frames the local conditions of poverty and vulnerability; and (ii) the practical aspect of obtaining the required information. This was done using straightforward and replicable means of data-gathering and analysis.

As part of the study, a methodology was developed using SLA as the basis for identifying objectively verifiable indicators to monitor poverty, vulnerability, marginalization and food insecurity among artisanal fishing communities. This methodology was then used to conduct a thorough analysis of the livelihoods of coastal fishers in eight locations. The analysis yielded a range of issues related to the assets of coastal fishers and to the key factors influencing their lives and livelihoods. The factors considered were both direct (policies, institutions and processes from the SLF) and indirect (the vulnerability context comprising trends, shocks and seasonality).

From the consolidated summary of key issues, a set of indicators was drawn up in discussions with primary and secondary stakeholders, and was further refined in later

stages of analysis. This set of indicators was then taken to fishing villages along the coast of Orissa and validated using a range of tools and techniques. Some indicators fell by the wayside in this process because they could not be generalized across a larger sample of villages, while others were refined or modified based upon feedback obtained during the validation phase.

This methodology was used systematically in all villages and yielded consistent results throughout, indicating that it could be used in a wider range of contexts and for a number of other purposes. The design is based on the assumption that these indicator monitoring systems will be developed and deployed largely by field workers, who may not always have the capacity to undertake complex, detailed and time-consuming exercises to obtain information. The need to keep the methodology simple and straightforward was a constant concern.

It must be noted, however, that the methodology has been described here as it was used in this study, rather than as a prescriptive guide for future work. All participatory exercises demand flexibility in approach, and all researchers will need to be innovative in adapting the range of available tools to obtain valid information and to maintain relationships on a balanced footing. No single methodology or even a set of methodologies can adequately provide a handle on issues of this order of complexity.

STRUCTURE OF THE STUDY

The field study followed a tiered approach consisting of four stages, each evolving from the previous one so that findings were validated, refined, modified and accumulated at every stage. The four stages of the case study were:

1. literature review
2. institutional stakeholder meetings
3. field research in selected villages
4. wider validation of study findings in a larger sample of villages

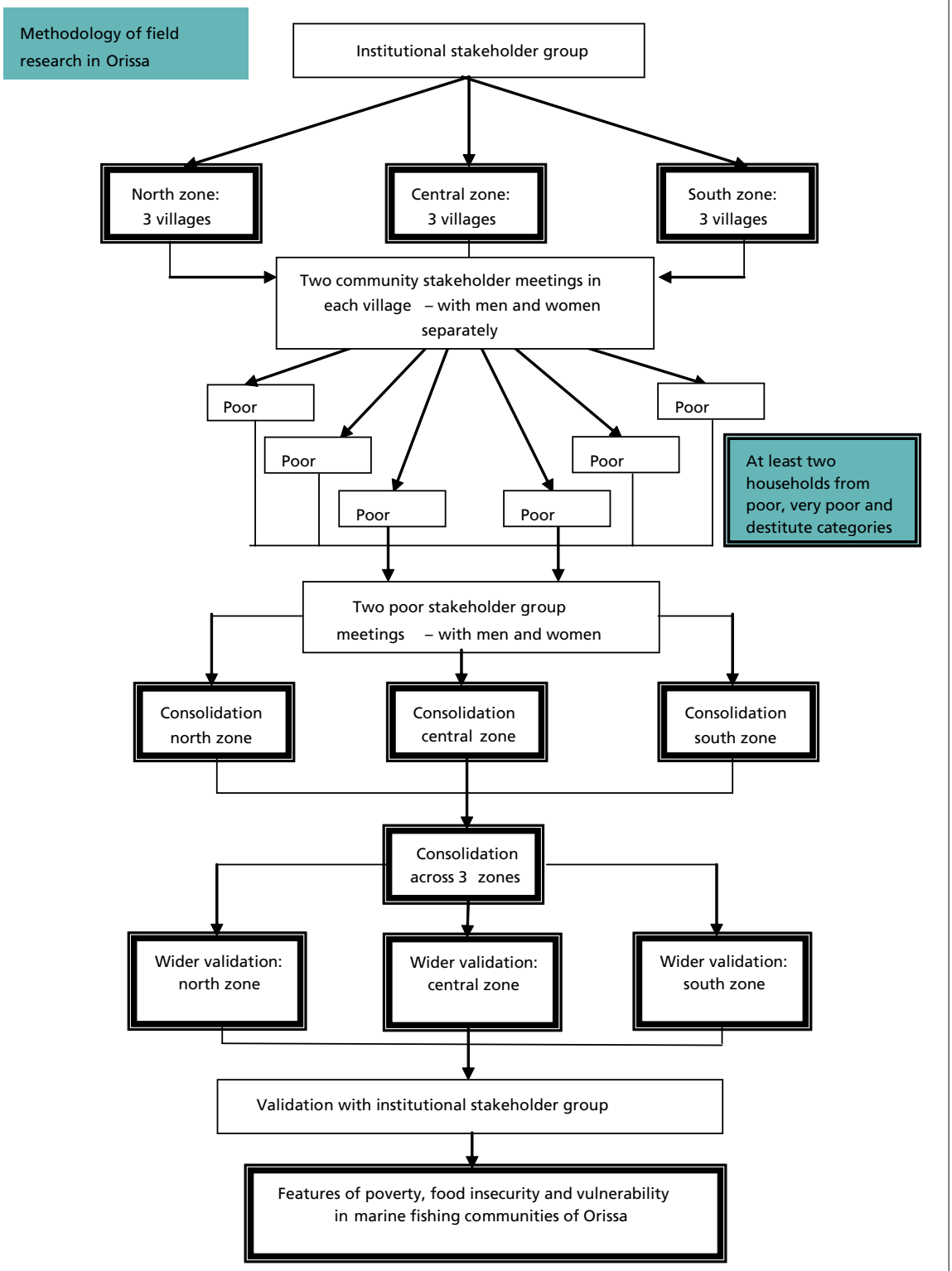
Secondary literature review

The first stage in this study involved a secondary literature review on poverty, food insecurity and vulnerability in the state of Orissa in general, and in the six coastal districts in particular, with a focus on the artisanal fishing communities. The literature review proved crucial in:

- consolidating all available information – qualitative and quantitative – on issues of poverty, food insecurity and vulnerability in fishing communities in Orissa;
- identifying the key players working on these issues;
- identifying the processes by which information is collected, disseminated and used in policy formulation and implementation;
- identifying the priorities that lead to the collection of specific kinds of information over others;
- identifying gaps, lacunae and shortcomings in the available information so that field research could concentrate upon these;
- articulating a framework for filling the gaps with secondary data where possible, and validating and refining data through field research;
- ensuring that the research results fit into the existing information sources in a form that can inform and influence policy responses.

Using the SLF, information from the secondary literature review was gradually (and continuously through the project period) expanded into a working document. Once the framework began to be fleshed out with the required information, this document allowed an identification of gaps in the literature. As the following sections will show, there are significant gaps in the available information, in qualitative as well as quantitative terms. Information, where it exists, frequently tends to be inconsistent from one source to another.

FIGURE 3
Methodology of field research in Orissa



Using secondary data to flesh out the framework also helped set limits on the amount of information to be collected in the field, which in turn prevented the research from being carried away in all directions or in some directions more than others. Moreover,

having secondary information in hand at the time of field studies also permitted a fleshing out and validation of this data, adding a qualitative dimension that it often lacked. This stage of the research process helped to position the study results in the context of what was currently known about poverty, food insecurity and vulnerability, thereby enhancing the scope for a positive uptake of its conclusions.

Institutional stakeholder meetings

Institutional stakeholder meetings involving the Government, non-governmental organizations (NGOs), bilateral and international aid agencies, banks and other civil society organizations were conducted at the beginning of the field research in order to:

- seek these stakeholders' opinions about the relevance of the study to their areas of work;
- obtain an understanding of their perceptions of poverty, vulnerability and food insecurity among fishers;
- seek information on relevant secondary data available through them;
- discuss salient points that emerged from the secondary literature review and validate, refine, add and modify them on the basis of feedback from these stakeholders;
- gain an insight into the policy-making processes targeting poverty and related issues, as well as information on the specific policies themselves and their (perceived) impacts;
- determine the type of outputs that would be most appropriate for their policy-making needs, including the forms in which these outputs could be most usefully presented and the levels of organizational hierarchy that should be targeted.

In addition to providing a good understanding of the institutional perspectives on the issues being investigated, these meetings also ensured that the institutional stakeholders were made a part of the process from the outset, thereby giving all participants a sense of ownership of the study and its results.

The structure of the field studies is presented graphically in Figure 3.

Field research in selected villages

Selection of field study sites

A wide range of ecosystems and geographical/linguistic groups was covered during the study. Nine villages – three in each zone – were selected for the field studies (Table 1), based on the following criteria:

- availability of secondary data on the village;
- prior existence of an NGO that had good rapport with the community and was willing to work with the study team in conducting the field studies;
- a population of largely homogeneous marine fishing communities (even if fishers depended part time on inland, i.e. riverine or backwater, fishing, they should be mainly engaged in marine fishing);
- a village size of about 1 000 people (or 200 households) – optimal for the use of participatory methodologies, while also permitting generalization;
- one urban, one rural and one remote study site in each of the three zones;

TABLE 1
Villages selected for field studies

Northern zone	Central zone	Southern zone
Mirzapur near Chandipur-on-sea (urban; trawler base)	Paradeep (Sandakhud) (urban; trawler base)	Puri (Pentakota) (urban; largest fishing settlement in the state)
Balarampur (rural; Oriya-dominated)	Kharinasi (rural; Bengali/Bangladeshi migrants)	Nolia Nuagaon (rural; Nolia (Telugu)-dominated)
Tikayat Nagar (mangrove area; remote location; Bengali/Bangladeshi migrants; close to protected area)	Balipatna (remote location; Bengali/ Oriya fishers)	Kirisahi (island village in the Chilika Lake area – remote location)

- at least one location with one of the three majority groups (Bengalis, Oriya and Telugu fishers).

Developing and testing field research instruments

In order to apply the SLF in an interactive process with which both the communities and the field researchers could feel comfortable, it was necessary to bring the framework – including its language, structure and content – to the grassroots level. The framework also needed to be refined to focus upon issues specific to the study. Other considerations included:

- the level at which discussions would take place;
- time available for each level of interaction;
- the need to ensure a smooth and chronological flow of information;
- the application of participatory tools in a non-obtrusive way; and
- prompt consolidation of information at the field level for rapid validation and documentation.

The field research predominantly employed participatory research tools, with local village contexts and individual researcher preferences determining the exact tools selected. One mock exercise was undertaken at the start of the field process in a village not included in the main study, in order to fine-tune the research methodology.

Fieldwork in selected villages

Field studies in a given village also took a tiered approach. The first tier of respondents was broadly composed, including representatives of all key groups in the village. Specific attention was paid to involving women, older and physically challenged people and other marginalized groups. This community stakeholder group (CSG) meeting was intended to:

- develop an understanding of the assets, vulnerability patterns, socio-economic structures and livelihood processes relevant to fishers in the village;
- assess the community's understanding of and perspectives on poverty and the poor people in the village; and
- determine which groups of artisanal fishers could be considered poor and why.

Two separate meetings were conducted for men and women respectively in each village, which yielded different perspectives on the issues.

Identifying poor stakeholder groups

The first step in identifying the poor stakeholders in a village was to develop a list of fisheries-based livelihood groups in the village, along with the number of people in each category. The livelihood groups included not only those directly dependent on fishing and fish trade, but also ancillary workers such as basket weavers, net menders, transporters, mechanics and food vendors.

It was recognized from the start that characterizing a broad stakeholder group as poor was bound to be problematic, because poverty and livelihood insecurity vary based upon a range of factors, such as multiple livelihoods, multiple earners in a family and differences in gender, caste and age. At the household level, the level and intensity of poverty and deprivation fluctuate over periods of time as well as seasonally and among different members. Also, while absolute poverty is easier to define and identify, relative poverty is not so easily discernible and varies from place to place. Thus, any generalization about poverty based upon livelihood activities has to be made with a measure of caution.

Defining poverty through a composite index of a range of variables identified by fishers themselves enabled a good understanding of poverty at the community level, as well as the identification of poor groups from the community's perspective and of the relative proportions of different livelihood groups in a village.

At the CSG meetings, the field team conducted a wealth-ranking exercise to determine the characteristics of the well-off, poor, very poor and destitute categories of people. Then two households in each of the last three categories were identified for the next phase of research. These six households were interviewed at their residences, and care was taken to ensure that several members of the family had an opportunity to present their perspectives.

In the next stage, at a single meeting with a range of poor stakeholder groups (PSGs) from across the study sample, the information from the household studies was validated. The PSG meeting filled gaps in the information from the household interviews and provided an analysis of the phenomena observed. As in the case of the CSG meetings, it was found necessary and productive to have meetings for men and women separately at the PSG level.

Validation of field research findings in a larger sample of villages

A quick survey was conducted to validate the key findings of the first phase of research in a larger sample of villages. The findings from eight villages were summarized to specify common features of poverty, food insecurity and vulnerability. These indicators were then developed into a set of statements on features of poverty and were used in a validation exercise in 18 villages across the six coastal districts of Orissa. The locations are shown in Table 2.

The indicators were of two types. The first were those that could not be linked to the vulnerability status of individual households, but which referred to general conditions of a village (such as inaccessibility, isolation, alienation from majority community), or of fishing livelihoods (such as excessive capture of juveniles in fish catches). These conditions impacted all sectors of fishers, irrespective of their status, and were validated at the community level.

The second set of indicators related to specific impacts of poverty, food insecurity and vulnerability at the household and intrahousehold level. After the village-level interactions, the field research team worked with two households each in the poor, very poor and destitute categories to validate these indicators. To obtain a more realistic validation, the issues were discussed in terms of their direct relevance to the household being interviewed rather than in general terms.

TABLE 2
Locations involved in validation exercise

District	Block	Village	Urban	Rural	Remote
Ganjam	Chikiti	1. Anantharayapuram			✓
	Gopalpur NAC[1]	2. Gopalpur on sea	✓		
	Ganjam	3. Podampeta		✓	
Puri	Krushna Prasad	4. Sannapatna		✓	
	GOP	5. Chandrabhaga	✓		
	Astaranga	6. Balipanthal		✓	
Jagatsinghpur	Balikuda	7. Ghosaghar			✓
	Kujanga	8. Jayasankarpur		✓	
	Erasama	9. Nolia Sahi		✓	
Kendrapara	Mahakalpara	10. Jamboo			✓
	Mahakalpara	11. Kondrapatia			✓
	Rajnagar	12. Govardhanapur		✓	
Bhadrak	Basudevpur	13. Padhuan			✓
	Basudevpur	14. Bidaipur		✓	
	Chandabali	15. Paikasahi	✓		
Balasore	Remuna	16. Ghoda Salapada		✓	
	Basta	17. Solpata	✓		
	Baliapal	18. Bada Talapada			✓

[1] Notified Area Council.

In some cases, the information obtained from a household was validated or verified by comparing it with data obtained from households of similar socio-economic backgrounds. NGO workers, school teachers, health workers and government and development workers in the village also helped in the validation.

Obviously, not all indicators carried the same weight. A task that was attempted only cursorily in this study was the relative weighing of different indicators by different categories of stakeholders. While the importance of the weighting factor is acknowledged, the vast diversity that characterized the groups of poor people in our study, and the different levels at which they were involved – from the state-level down to that of the household – made it too onerous to address adequately in this study.

Limitations

The study began with the aim of developing indicators to monitor poverty, food insecurity and vulnerability among coastal fishers. However, it was realized early that it would be more important to lay the foundations for a systematic analysis of the relations between livelihoods, poverty, food insecurity and vulnerability than to attempt to arrive at a final set of indicators of poverty. Thus, the study should be considered as the beginning of an investigation into the livelihoods of coastal fishing communities in Orissa, rather than as a definitive account concerning *all* aspects and facets of their lives and livelihoods. To the extent ascertainable, no such analysis has been attempted before, which has left a significant gap in efforts to inform and influence development policies concerning coastal fishing communities.

Although the study has produced a set of broad indicators of poverty, vulnerability and food insecurity and tested them in a range of fishing communities, these indicators need further refinement and modification, and some may eventually need to be discarded. Simply put, the indicators reflect what fishing communities in *selected* locations in Orissa considered important, but they need to be put into a more systematic and rigorous format for application. Once this is done, this set of indicators could yield a far better qualitative and quantitative picture of poverty, being reflective of *a whole way of life* rather than just a few facets.

CHAPTER 2

Overview of the marine fisheries of Orissa

ORISSA – AN INTRODUCTION

The state of Orissa is situated in the northeastern part of the Indian peninsula, with a coastline of 480 kilometres (km), about 8 percent of the coastline of India. It is bounded by the Bay of Bengal to the east and the states of West Bengal to the northeast, Jharkhand to the north, Chhattisgarh to the west and Andhra Pradesh to the south. Orissa may be broadly divided into four geographical regions – the northern plateau, central river basin, eastern hills and coastal plains (Government of India, 2003: 787). Bhubaneshwar is the capital of the state, with a population of 657 500 (Government of Orissa, 2001: 29). Cuttack, Puri, Berhampur, Sambalpur, Balasore, Baripada and Rourkela are the other important towns.

According to the 2001 census, the state has a population of 37 million (Government of India, 2003: 786), with an annual growth rate of 1.5 percent (Government of Orissa, 1997: 1/3). About 85 percent of the population, or 31.21 million people, lives in rural areas, while the urban population numbers 5.5 million (NIRD, 2003: 4), including 18.61 million men and 18.09 million women. Orissa's share in the national population in 1997 was 3.58 percent, and projections indicate that it is likely to come down slightly to 3.25 percent by 2012 (NIRD, 2003: 27). The average household size in coastal Orissa is 5.87 (NIRD, 1999a: 166), which fits well with this study's observation of a larger proportion of children to adults in fishing communities and at the household level.

Agriculture is the most important livelihood sector in the state, providing work to 64 percent of the working population directly or indirectly (Government of India, 2003: 787), while the percentage of people dependent on agricultural income is over 76 percent of the state's total population (Manorama, 2003: 685). Agricultural labourers constitute nearly 40 percent of the total workforce (NIRD, 2003: 53). Rice is the main crop (Government of India, 2000: 786) and Orissa contributes one-tenth of the rice production in India (Manorama, 2003: 685).

The state's dependence on the primary sector has made it extremely vulnerable to natural phenomena such as drought and cyclones. An analysis of rainfall in the state for the period 1965–1991 indicates that, except for four years during the entire period, the state was ravaged by natural disasters every year – severe drought, cyclones, floods, hailstorms, whirlwinds and/or tornadoes (DIPS Communication Centre, 1993). NIRD data (1999a: 119) show that in 15 years of the 25-year period between 1964/65 and 1988/89, food grain production in the state was affected by floods, cyclones, drought or a combination of these, resulting in wild fluctuations in food grain availability from year to year.

The primary sector's contribution to gross domestic product (GDP) declined from 75.3 percent in 1950/51 to 43.68 percent in 1994/95, while that of the tertiary sector rose from 19.2 to nearly 40 percent (Government of Orissa, 1997: 1/7). This might suggest a widening of the rural-urban disparity, as the bulk of secondary and tertiary activities are concentrated in urban areas.

The cyclone of 1999 had a severe adverse effect on the coastal areas in the state and was a major setback to the state economy (Government of India, 2000: 787; Government of Orissa, 2000: 1/10) and particularly to the fisheries sector (Department

of Fisheries – DOF, 2000). The floods that struck the coastal areas in 2001 severely crippled the rural economy, which had been recovering from the effects of the 1999 cyclone.

Poverty and quality of life indicators

The poverty line in Orissa was drawn at 323.92 Indian rupees (Rs) per month per capita in 1999/2000. People below the poverty line (BPL) number 14.3 million or 48 percent of the population in the rural areas, and 2.5 million or 43 percent in urban areas, taking the total number of poor below the poverty line in the state to 17 million, or 47.15 percent of the population (NIRD, 2003: 94).

The percentage of rural population below the poverty line in Orissa declined from 67.3 percent in 1973/74 to 48 percent in 1999/2000, while in the urban areas, it declined from 55 percent in 1973/74 to 41.6 percent in 1993/94, then rising to 43 percent in 1999/2000 (NIRD, 2000: 85; 2003: 91, 93–94). Despite these figures, the actual numbers of BPL families might have remained constant, or even increased during this period. For instance, while the percentage of overall BPL population in the state declined from 48.56 percent in 1993/94 to 47.15 percent in 1999/2000, the actual number rose from 160 lakhs (16 million) to 169 lakhs (16.9 million) (Sundaram and Tendulkar, 2003: 1385–1393). Despite a decline in headcount ratio, Orissa registered an increase in both the depth and severity of rural poverty, and was one of the three major states in the country in which the poverty situation worsened from 1993/94 to 1999/2000. NIRD (1999b: 92–141) reviewed the poverty situation in the state, which indicated that even in the 'developed' coastal districts such as Puri, Ganjam and Cuttack, more than 70 percent of the rural population was below the poverty line.

Basic infrastructure

An NIRD study (1999a: 67) that mapped poverty indicators for different states in India concluded that, in terms of housing, drinking water, water taps, electricity, toilets, primary schools and medical facilities, Orissa tops the list as a laggard on all but one count – primary schools. In terms of housing, 10 percent of the rural population had *pucca* (permanent) houses and another 19 percent had semi-permanent houses, while the large majority (over 70 percent) of people lived in *kutcha* (non-permanent) houses (NIRD, 2003: 297). In the coastal areas, 14.78 percent of households had access to permanent houses in 1991 (NIRD, 1999a: 172). In the same year, 35 percent of the households in Orissa had access to safe drinking water, 17.45 percent to electricity, a measly 3.60 percent to toilets and only 1 percent had access to all three (NIRD, 2003: 330). Over 96 percent of the households in the state still did not have access to a latrine in 1998.

Nearly 90 percent of rural households in the state used firewood for cooking during 1999/2000. Another 5.5 percent used dung cakes, while only 0.8 percent of the households had gas-based facilities (coal, kerosene or liquefied petroleum gas – LPG) (NIRD, 2003: 293). For over 81 percent of the families, kerosene was the primary source of energy for lighting; electricity was used by only 18.4 percent of households, although 72 percent of the villages were electrified by 1998 (NIRD, 2003: 259). The Government of Orissa (1997: 1/10) indicates that there was a deficit of 15 percent between demand and availability of electricity in the state. Table 3 shows access to various services in rural Orissa.

Education

According to 2001 estimates, Orissa has a literacy rate of 63.61 percent – 76 percent among men and 51 percent among women (NIRD, 2003: 67). In rural areas, the rates fall to 60 percent for men and 33 percent for women, bringing the overall rural literacy rate down to 46 percent. Literacy status among people belonging to the bottom

TABLE 3
Access to various facilities in villages of Orissa (1995/96) (percentage)

Bus stand	Bank	Post office	Fair price shop	Vet centre	Health centre	Primary school
18.67	6.00	19.00	24.00	6.00	13.00	67.00
Adult education centre	**All-weather roads**	**Police station**	**Weekly market**	**Supply depot (agricultural)**		**Coop society**
40.00	72.67	2.00	9.67	6.00		7.33

Source: NIRD, 2003: 333–4.

40 percent of the rural population economically is particularly low: in 1986, illiteracy in this category was 66 percent among men and nearly 90 percent among women (NIRD, 2003: 315).

The coastal districts rank highest in the state in terms of literacy (Government of Orissa, 1996b: 24), although this may not apply to the fishing communities, which are known to have very high rates of illiteracy. Project documents of the United Artists Association (UAA), a local NGO, indicate that literacy in the 15 fishing villages where it worked was 8 percent in 1992, with a paltry 2 percent among women (UAA, 1998: 4). A report by the FAO Bay of Bengal Programme (BOBP) shows that literacy rates in the coastal villages of Orissa were below those for their respective districts and also below the national average, and suggested that among marine fishers the literacy rates were even lower (1987b: 10). Tietze (1985: 116) found that 90–92 percent of people in the labourer and small-owner categories in the southern zone were uneducated.

These low levels of education in fishing communities were attributed to the open-access nature of the resources, which encourages involvement of children in productive activities in the short term (BOBP, 1987b: 10). The relative isolation of several fishing villages also played a key role in undermining access to education in the fishing communities. There are currently signs that more children are attending school.

Health and nutrition

In Orissa, the birth and infant mortality rates have shown a decline through the late 1990s, although the death rate appears to have remained constant. The incidence of hunger (i.e. whether all members in a household could obtain two square meals a day) in rural areas in 1999/2000 is shown in Table 4.

This indicates that over two million people in rural areas have access to two square meals a day only some months of the year, while another half a million do not have even two square meals in some months.

The average monthly consumer expenditure per person on food and non-food items in rural areas for the period June 1999–July 2000 for Orissa shows a 64 percent expenditure on food items (NIRD, 2003: 78, 81). In terms of total consumer expenditure per capita per month, Orissa stands last in the whole country. This study has revealed that in fishing communities, the expenditure on food seldom came to less than 60 percent of total expenditure. In 1998 about 16 percent of households in the state reported insufficiency of drinking water for some part of the year (NIRD, 2003: 328).

Little information is available on the health and nutritional conditions of fishers. There is very little data on nutritional status and fish consumption among fishing communities, but a desk study by BOBP (1986b: 2) concluded that, on the east coast of India, "Seen from the perspective of calorific value of food, the dietary habits of fishers' families seem to be far from satisfactory. As a result most of the villagers, especially children, suffered from a very high degree of vitamin deficiency and malnutrition, which resulted in their being susceptible to serious illness." This study provided substantial primary information to

TABLE 4
Members of households getting two square meals a day (percentage)

	Throughout the year	Only some months of the year	Not even some months	Not reported
Orissa	91.6	6.50	1.50	0.40
All India	96.2	2.60	0.70	0.50

Source: NIRD (2003: 98)

substantiate this conclusion. Dreze and Sen (1995: 29) indicated that the infant mortality rate in Ganjam district in Orissa was the highest in the world. UAA's surveys in 15 coastal fishing villages in Ganjam and Puri districts in 1992 indicated an infant mortality rate of 159 against the national average of 99 (UAA, 1998: 8).

Food insecurity and vulnerability in rural Orissa

The MS Swaminathan Research Foundation (MSSRF, 2001) provides a detailed statistical picture of food insecurity in rural India in terms of the three accepted dimensions of food insecurity and vulnerability, i.e. availability, access and absorptive capacity, and using a range of indicators for assessing each category across the country. Based on these indicators, rural Orissa is placed in the category of states with a 'moderate' food availability condition, whereas in terms of access and food absorption, it falls in the 'very low' category. A cumulative index of food availability, access and absorptive capacity for the country places rural Orissa in the 'severely food insecure' category.

COASTAL ORISSA

There are six maritime districts in the state: Balasore (80 km), Bhadrak (50 km), Kendrapara (68 km), Jagatsinghpur (67 km), Puri (155 km) and Ganjam (60 km), with Puri district covering more than a third of the coastline (DOF, 1998: 61). These six districts cover 14.5 percent of the total land area in the state, but contain nearly 30 percent of its total population (28.35 percent), with an average population density more than twice that of the state as a whole (430 against 203) (DES, 1999–Balasore: 2–3). Nearly 89 percent of the coastal population resides in rural areas.

According to the Handbook on Fisheries Statistics of Orissa, 2000/01 (DOF, 2002), Orissa has a total of 589 marine and 3 289 inland fishing villages. These figures are somewhat perplexing, because in the two previous yearbooks of DOF, for 1992/93 and 1996/97, the number of marine fishing villages was given as 329 and the inland fishing villages as 6 895 and 6 899 respectively. It is possible that, in the post-1999 cyclone period, many inland (or estuarine) fishing villages were included in the marine category in order to make them eligible for support under various relief and rehabilitation packages. This could also partly explain the decline in the number of inland fishing villages during the period.

Socio-economic and demographic profile of Orissa's coastal districts

The distribution of poor people in the coastal, southern and northern zones of the state is 45, 25 and 32 percent respectively. The concentration of poor people in the coastal regions (Table 5) could be a result of in-migration from the other two areas, which are some of the poorest in the country (NIRD, 1999a: 15). In coastal Orissa, of the 45 percent of poor people, 19 percent fall into the very poor and 26 into the moderately poor categories. In 1991, only 15 percent of the population had access to *pucca* houses, 37 percent to safe drinking water, 23.5 percent to electricity, 4.5 percent to toilets, 72 percent to primary schools, 19 percent to medical facilities, 20 percent to postal and telegraph facilities and a mere 0.8 percent to water taps (NIRD, 1999a: 154–6). The availability of electricity determines access to chilling, preservation and processing facilities for fish, and the lack of electricity in remote coastal villages constitutes a major obstacle to improving quality and maximizing returns from catches.

TABLE 5
Number of rural families below the poverty line in the six coastal districts

District	Rural families	Rural families below poverty line	Percentage of BPL families to rural families
Balasore	167 974	121 550	72
Bhadrak	215 185	136 849	64
Kendrapara	219 436	131 424	60
Jagatsinghpur	172 300	92 920	54
Puri	236 721	163 639	69
Ganjam	478 899	293 493	61

Source: BPL survey 1997, undertaken by district rural development agencies, Panchayati Raj Department, Government of Orissa (not available as stand-alone documents).

TABLE 6
Number of fishing households and fishers in the six coastal districts

District	No of households	Population of fishers			
		Men	Women	Children	Total
Balasore	14 489	24 923	23 938	53 961	102 822
Bhadrak	6 980	14 362	12 503	19 916	46 781
Jagatsinghpur	6 915	11 377	10 239	16 309	37 925
Kendrapara	6 216	12 299	11 353	16 721	40 373
Ganjam	7 088	10 641	10 020	17 049	37 710
Puri	11 332	20 889	18 087	28 185	67 161
Total	53 020	94 491	86 140	152 141	332 772

Source: DOF, 2002: 66.

Population of marine fishers in the state

According to DOF, 2002: v, the total number of fishers in the state is just over 1 million. The total marine fishing population is about a third of a million, which, when compared to the total population of the state, is not very large. This explains the relatively low priority given to marine fisheries as a livelihood option. Table 6 gives information on the total number of fishing households and population in 2000/01 in the six coastal districts of Orissa.

Chart 1 summarizes the growth in the fisher population in Orissa between 1984 and 1997 (BOBP, 1984a: 6; DOF, 1998: 1, 1993: 3). Chart 2 gives the ratio of active fishers to total fishing craft in Orissa for 1984 (BOBP, 1984a: 19; 1984b: 6) and 1996/97 (DOF, 1998: 1, 71), which indicates that the ratio of active fishers to craft has increased from 3.8 in 1984 to 4.4 in 1997 and up to 7 in 2000/01 (DOF, 2002).

CHART 1
Growth of fishers population in Orissa during 1984–2000

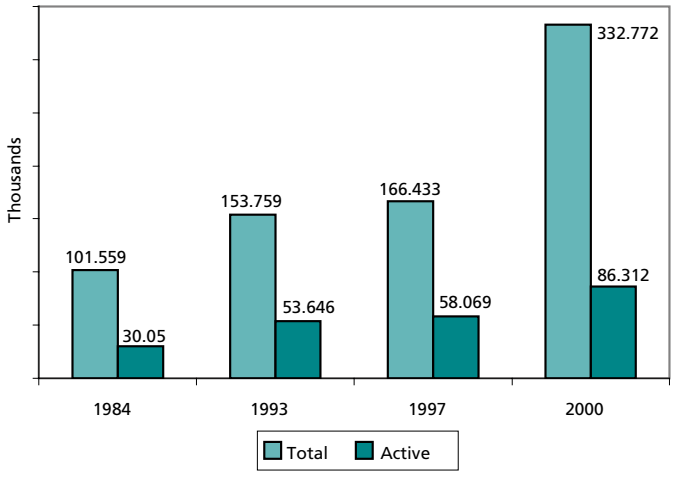
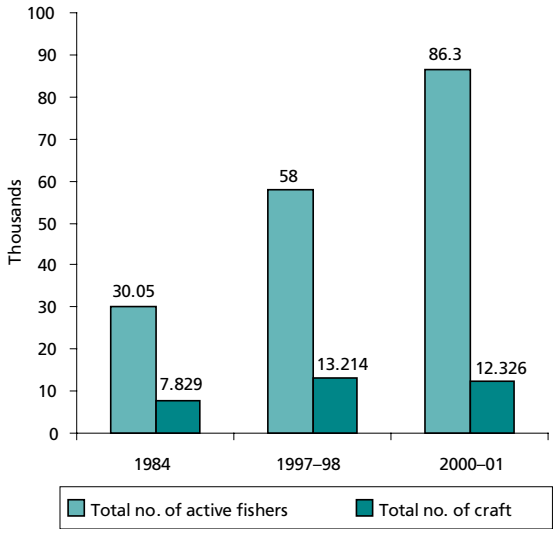


CHART 2
Ratio of active fishers to the total number of fishing craft in Orissa, 1984–2001



Active fishers

According to the Department of Fisheries (DOF 2002: 66), there are about 86 000 active marine fishers in the state. The total number of boats is about 12 500, which means that the total number of fishing crew could be about 50 000–60 000. One important feature of marine fisheries in Orissa is the in-migration of fishing craft from Andhra Pradesh during certain periods of the year. Fishers from areas north of Kakinada in Andhra Pradesh migrate annually to Puri, Konark, Astaranga and

Paradeep. It is not known how many boats on average migrate into Orissa and what their contribution in terms of overall catch and value of fish is to the state economy.

Ancillary fishworkers

Ancillary fishworkers include handlers and processors, commission agents, middlemen, carriers and transporters, truck and bullock cart operators, peelers, shrimp head-removers and processors, packers and handlers, exporters and processing plant operators, ice makers, sellers and crushers, in addition to technicians, crate and basket makers, insulated systems manufacturers and sellers, etc. DOF (2002) reports that there are over 33 500 people in ancillary occupations, but this information is not disaggregated by categories of activity. It is possible that the numbers could be much higher, because in several fishing villages, the ancillary workers were seen to outnumber active fishers greatly. Within the ancillary category, some 14 500 workers are women. They play an important role in processing and trade in local markets. Several women are also known to travel much longer distances, sometimes outside the state, to sell dried fish.

Physical features of coastal Orissa

The continental shelf area of 24 000 km^2, of which about 65 percent is in the 0–50 metre (m) depth range (DOF, 1998: 61) is widest off the northern district of Balasore (nearly 120 km in width), and narrows towards the south (to 40 km) (BOBP, 1994: 1). This has implications for the fishing systems in the state. The coastline can be classified into two distinct areas (BOBP, 1984a: 9; 1986a: 1; Ayyappan and Jena, 2000: 241).

- The shallower northern coast extending northward from Rajnagar in Jagatsinghpur district to Kistania in Balasore district. This area has a broad shelf, gradual slope and greater tidal effect, with muddy and calm waters, and is characterized by tidal flats and extensive river deltas.
- The southern coast extending southward from Paradeep in Jagatsinghpur district to Pattisonapur in Ganjam district, which is narrower, with broad sandy beaches and open surf-beaten shores.

In the southern zone, the waters from Bahutia estuary to the mouth of Chilika Lake are considered to be the deepest region with a rocky bottom. The coastal waters from the mouth of this lake to Dhamra, although comparatively shallow, are rich in demersal and pelagic fish. The offshore region from Dhamra to the mouth of the Subarnarekha is much shallower and has commercial pelagic fisheries.

Coastal variations from the southern to the northern zone determine the fishing systems and post-harvest disposal of catches (Xavier Institute of Management – XIM, 1991: 40). A majority of small-scale fishing activities in the northern zone take place in the intertidal zone (which could extend up to 5–6 km from the shore) or shallow waters and are focused mostly on demersal species, whereas the southern zone specializes in open-sea-based, often pelagic-dominated fisheries.

Chilika Lake

Chilika is the largest brackish-water lake in Asia. It covers an area of 906 km^2 during the summer and 1 165 km^2 during the monsoon period. Chilika is Orissa's leading centre for fish, prawn and crab fisheries. Nearly 125 000 fishers, spread over 132 fishing villages, depend on Chilika Lake for subsistence (DOF, 2002: 46). A total of 454 motorized and nearly 5 000 traditional boats operate in the lake (DOF, 1998: 47).

Mangroves

Bhitara Kanika in Orissa is the second largest mangrove forest in the country, second only to the Sunderbans of West Bengal (Ayyappan and Jena, 2000: 244). Located in the Kendrapara District of Orisssa, the Bhitara Kanika sanctuary spreads over 650 km^2 with a forest cover of 380 km^2, of which mangroves cover 115 km^2. The mangrove

habitat acts as a nursery ground for many fish and shellfish species of commercial importance. The Gahir Matha beach of Bhitara Kanika is the biggest nesting ground of Olive Ridley sea turtles in the world. About half a million of them are estimated to arrive on the coast during late December to January and again from mid-March to April (Ayyappan and Jana, 2000: 244).

Inland and brackish-water resources

As freshwater fish is one of the main food ingredients in the state, inland fisheries and freshwater aquaculture have a great importance (Ayyappan and Jena, 2000: 240). DOF (1998: 35) lists a total of 35 important rivers in Orissa. In addition, the state has 115 000 ha of tank or pond resources; 256 000 ha of reservoirs; 180 000 ha of lakes, swamps and *bheels* (small, flood-formed lakes); and 155 000 ha of rivers and canals, with a fisheries potential of over 300 000 tonnes (DOF, 1998: 17). The present level of exploitation, however, stands at just over 55 percent of the estimated potential (Ayyappan and Jena, 2000: 240).

The Government of India (1996: 139) estimated that there were some 31 600 ha of brackish-water lands suitable for aquaculture in Orissa, with the largest concentration found in Puri (4 500 ha), Jagatsinghpur (2 570 ha), Kendrapara (1 800 ha) and Ganjam (1 500 ha). Brackish-water aquaculture in the state grew very rapidly in the 1980s and 1990s. Ayyappan and Jena (2000: 240) report that in 1983/84 it was confined to only 23.5 ha. BOBP (1984a: 70) reported that in 1984, about 240 ha were under aquaculture. By 1993, this figure had risen to 9 600 ha (DOF, 1993: 57), and in 1997 DOF (1998: 41) reported that some 12 500 ha were developed for aquaculture. Of this, 11 500 ha (92.3 percent) were under extensive, 320 ha (2.5 percent) under modified extensive and 637 ha (5.13 percent) under semi-intensive cultivation (Ayyappan and Jena, 2000: 240).

Distribution of fishing craft in Orissa

Orissa boasts of a wide range of fishing craft suited to diverse environmental and hydrographical conditions. BOBP (1986a) and Tietze (1985: 31–40) provide overviews of the traditional fishing craft of Orissa, and BOBP (1984b) offers a detailed analysis of craft-gear combinations and their relationship to the socio-economic conditions of fishers. This analysis uses primary information generated in a door-to-door census and field observation of fishing equipment in all the coastal fishing villages of Orissa. There has been no follow-up survey providing comparable data in recent years. Such a study would provide a good understanding of the far-reaching changes that have taken place in the sector in the intervening period.

Fishing craft and nets vary from north to south. The rivers along the northern coastline provide sufficient shelter and deep enough water to allow the operation of plank-built displacement boats, which operate in shallow water. The most common of these in the northern zone are the *danga* and dinghy (BOBP, 1986a: 1). Other types include the *salti, chhoat, patia* and *sabado*. In the southern zone, *teppas* (log rafts or catamarans) operate from the beach. Other boats in the south are the bar boat and the plank-built *nava*.

Gillnets and lines are used all along the coast, but have different specifications in the north and south (ICSF, 1996: 58). Other typical gear of the south is boat seines, longlines and lift nets. The typical gear of the north consists of set bag nets, tidal wall nets and encircling gillnets. In the extended shallow shelf areas off the Balasore coast, encircling nets and inshore seines are operated, while set bag nets are operated in the river mouths and estuaries in the districts of Jagatsinghpur, Kendrapara and Balasore.

Landing, preservation and transport facilities in the fishing sector

In Orissa there are four major fishery harbours, 10 fishery jetties, 15 small fish landing centres (seven of which were under construction in 1997) and 6 fish landing platforms

(DOF, 1998: 82–84). In other areas, particularly in the south, fish are directly landed on the beach (XIM, 1991: 40). In the northern zone, where landing centres are often narrow and muddy, fishers carry fish in net-bags to the godowns, or warehouses, where raised platforms serve as auctioning podiums. The main harbours for mechanized boats are in Dhamara (Balasore), Paradeep (Jagatsinghpur), Nuagarh (Astaranga-Puri district) and Gopalpur (Ganjam district) (DOF, 1998: 82). The Paradeep fishing harbour was opened in 1996.

The introduction of ice in the 1990s changed the fisheries sector rapidly. Dahl and Forsgren (1988: 24) noted that the beach landing craft (BLC) from Pentakota carried salt on board to preserve the fish. However, by 1988 important fish landing centres such as Pentakota had ice plants, and fishers had ready access to ice after landing the catch. Many coastal areas now have access to ice, which is either locally produced or brought to the landing centres by traders.

In the early 1990s, fishing craft in the northern zone began incorporating ice holds on board. Smaller prawn trawlers carried ice for both fish and prawns. Boats in the southern coast – with the exception of mechanized trawlers and some fibre-reinforced plastic (FRP – 'fibreglass') boats – do not bring ice on board, because either it is not available or there is inadequate space. In Ganjam district, consumer preferences are against icing fish. In towns such as Chatrapur and Berhampur, a large majority of consumers view iced fish with suspicion. The fish traders, who buy in the evenings for sale in the nearby urban areas the next day, store it in ice overnight, but remove the ice early the next morning. Once the chilled fish reach normal room temperature, sand is sprinkled on them – to give the impression that the fish have come directly from the landing centre – before they are taken to the town by head loads.

In Orissa, road and rail transport networks are less developed than in the rest of the country (Government of Orissa, 1997: 20/4; 3/7). However, road transport by truck – both insulated and uninsulated – has increased rapidly in the last decade at several fishing centres, although the size and magnitude of these operations are not documented. Transportation and telecommunications facilities have made it possible to move fish over long distances in a very short time, and this has contributed to the rapid development of markets for fresh fish. Large-scale traders can visit more villages than previously and arrange for fish to be iced and easily transported from the most remote ones. It is reported that road transport accounts for a large percentage of the fish transported from the northern zone to Kolkata, as well as for freshwater fish transported from within and outside the state.

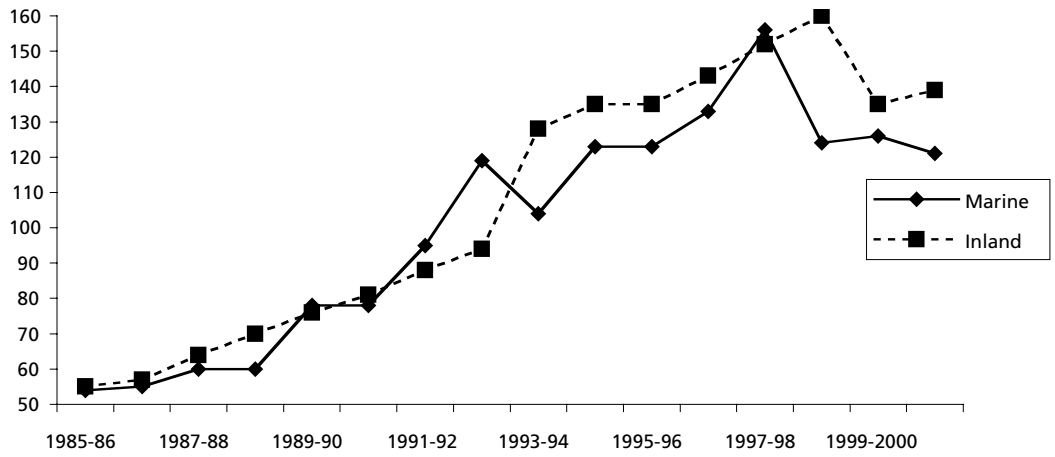
FISH PRODUCTION IN ORISSA[2]

According to DOF, overall fish production has shown a continuously increasing trend since 1985/86, although production from brackish water sources (e.g. Chilika Lake) showed a downward trend. Between 1985/86 and 2000/01, total production increased from 108 700 to 260 000 tonnes (DOF, 1998: 8; 2002: 3), an increase of nearly 250 percent, as against a 58 percent increase for the country as a whole (Government of India, 1996: 24–25). Production reached over 300 000 tonnes by 1997/98, but dropped to 260 000 tonnes in 2000/01. One reason for the decline could be the cyclone of 1999, which devastated coastal areas and reduced fishing capacity by destroying most of the boats.

Between 1985/86 and 1996/97, marine fish production rose from 53 600 to 133 500 tonnes (a 250 percent increase), and that of inland waters from 55 000 to 143 500 tonnes (an increase of 260 percent) (DOF, 1998: 8) (Chart 3). Marine production declined to 121 000 tonnes by 2000/01, while freshwater production also dipped to 125 000 tonnes during the same period.

[2] Adapted, revised and updated from ICM (2000a).

CHART 3
Fish production in Orissa 1985/86–2000/01 (tonnes)



Source: DOF (1998 and 2002).

Total freshwater production from different sources (tanks/ponds, reservoirs, lakes/swamps/*bheels*, rivers and canals) was estimated at 125 000 tonnes in 2000/01, which was four times higher than the figure for 1985/86 (31 000 tonnes) (DOF, 1998: 17). Capture fisheries accounted for about a quarter of freshwater production.

Total brackish-water production in the state declined from 24 000 to 16 000 tonnes – a decline of 33 percent – from 1985/86 to 1996/97, although production from brackish-water culture sources rose from 205 tonnes in 1985/86 to 6 430 tonnes in 2000/01, accounting for nearly 45 percent of total brackish-water production. The contribution from inland and marine sectors was more or less constant over the period, each contributing approximately half the total landings (DOF, 1998: 10). In terms of value, inland fish contributed 60 percent (Rs6 291 million) in 2000/01. The value of freshwater fish production may have been declining in comparison with marine fish over the last five years (DOF, 2002: 6). The total fish supply in 2000/01 was 260 000 tonnes.

Current status of marine fisheries resources

A review of the status of marine fisheries resources in Orissa provides a rather confusing picture. According to Fish Survey of India estimates, the maximum sustainable yield up to a depth of 200 metres off the coast of Orissa is 125 600 tonnes (DOF, 2002: 15). However, DOF statistics through the 1990s indicate that this limit has been reached and even crossed many times. The Government of Orissa's Ninth Five-Year Plan sets a target of 161 275 tonnes annually from the marine sector, to be achieved by the end of 2002 (Government of Orissa, 1997: 13–6). DOF figures for 1990/91–2000/01 are shown in Table 7.

However, the catch statistics for Orissa as presented by the Central Marine Fisheries Research Institute (CMFRI) indicate that total catches in Orissa during the years 1991–2000 were far below those reported by DOF, even after discounting the possibility of overlap due to differences in reporting periods (DOF tracks fish landings by fiscal year, while CMFRI follows the calendar year). Table 8 shows the CMFRI figures from 1991 to 2000.

TABLE 7
Marine fisheries resources 1991/92–2000/01

1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/2000	2000/01
95 026	119 376	103 925	122 892	123 199	133 462	156 081	124 329	125 935	121 086

Source: DOF, 1998: 62; 2002: 3.

TABLE 8
Catch statistics for Orissa 1991–2000

1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
44 524	47 622	62 281	47 745	43 108	53 591	45 657	44 227	58 329	84 622

Source: Mar. Fish. Infor. Serv., T&E Series No. 136, Jan., Feb., Mar. 1995; Sathiadhas, 1998: 15; H.M. Kasim, personal communication, 2003.

Significantly, while DOF statistics indicate that total fish catch in the marine sector has consistently increased during the 1990s, fishers in the study and the development agencies working with them maintained almost unanimously that fish catch had declined steeply during this period (Salagrama, 1999a).

The inconsistencies in the data on potential and actual yields leave many unanswered questions about the state of fisheries, levels of exploitation and current status of fish resources in the state. This is a serious situation: policy-making in the fisheries sector relies on this data to identify areas of action, and the large gaps and contradictions are likely to lead to poor policy formulation and implementation.

Species composition of supply

Marine fish

Marine catches in the state were dominated by sciaenids (12.23 percent), followed by elasmobranchs (7 percent), catfish, hilsa, pomfrets, other clupeids, polynemids and prawns, as well as miscellaneous varieties contributing as much as 53 percent of total production (Ayyappan and Jena, 2000: 240). In terms of district landings, Balasore landed the maximum catch (27 percent), closely followed by Jagatsinghpur, Puri, Kendrapara, Bhadrak and Ganjam.

Brackish-water production

A total number of 217 species of fresh- and brackish-water fish comprising 147 genera, 71 families and 15 orders were reported from Chilika Lake, as well as 24 species of prawns and shrimp, 9 families of crabs comprising 28 species and 136 species of molluscs under 66 families (Ayyappan and Jena, 2000: 242). The annual production from the lake, which reached a maximum of 8 872 tonnes in 1986-87, showed a decreasing trend thereafter. The main species of fish caught in Chilika include mullets, sciaenids, threadfins, catfish, hilsa, clupeids, perches, *Etroplus suratensis*, shrimp species including *Penaeus monodon*, *P. indicus*, *P. semisulcatus*, *Metapenaeus monoceros* and *M. dobsonii* and crab species such as *Scylla serrata* and *Neptunus pelagicus* (Ayyappan and Jena, 2000: 243).

Changing pattern of fish production in artisanal and motorized/mechanized sectors

Motorization of fishing craft in Orissa began in 1956 (BOBP, 1984a: 1), but motorization and mechanization gathered momentum only after 1980. The total number of traditional fishing craft declined from 12 810 in 1992 to 7 047 in 2001 (DOF, 2002: 63) and motorized traditional craft increased from 5 in 1985/86 to 3 643 in 2000/01. The contribution of non-motorized boats to total landings declined from 52.5 percent in 1985/86, through 33.4 percent in 1996/97 and down to 24 percent in 2000/01 (DOF, 2002: 58). At the same time, the contribution of the mechanized sector to total landings increased from 25 000 to 89 000 tonnes (47.5 to 66.7 percent).

Channels of fish marketing in Orissa

Fish are sold in myriad forms in Orissa, with the more important being:

- fresh (for local sale): mackerels, croakers, sardines and other clupeids; even expensive varieties such as seer and pomfrets when landed in remote villages;
- chilled (mainly for distant domestic markets): seer, pomfrets, hilsa, snappers, croakers, and for onward processing at a later stage, shrimp;
- frozen (for export): shrimp, cuttlefish and squids;

- dried: anchovies, ribbonfish;
- salt-dried: mackerels, croakers, larger ribbonfish; and
- wet-salted: shark and all big-bodied fish.

Methods of processing and differences in processing regimes are found to be dependent on a range of factors, including:

- variety of fish (high value/low value);
- scale of demand (large-scale/small-scale traders in the village);
- market orientation (catering to poor/affluent clientele);
- infrastructure (good/poor for icing);
- consumer preferences (amount of drying, salt used);
- seasonal fluctuations in demand and supply; and
- socio-economic status of processors.

The importance of the coastal fish trade from a livelihood perspective lies in the fact that it accounts for the largest segment of all fish traders at any landing centre. Being the most easily accessible activity for fishers or for members of fishing households, and one that puts few or no demands on investment capacity, it offers a livelihood opportunity for some of the poorest people in the area. Many people depend on the cheaper varieties of fish. The retail trade within coastal communities is heavily dependent on fresh marine/estuarine species. Poorer consumers in coastal or near-coastal areas obtain their fresh fish primarily from head loaders (women) and bicycle fish vendors (men), and the varieties available to them are mostly the cheaper fish, such as bycatch from gill-netters and trawlers.

The main urban centres for fish within the state are: Cuttack, Puri, Bhubaneswar, Rourkela, Berhampur and Sambalpur. Major out-of-state urban markets for fresh fish include Howrah, Chennai, Hyderabad and New Delhi. The inland markets in Orissa are of two types – those with good transport linkages and those without. Markets with good transport linkages receive large quantities of fresh fish from both capture and culture sectors. In most fish landing centres, a large number of cycle traders transport fish up to 80 km inland. With the increasing demand for marine fish, the numbers of cycle traders may be increasing. Markets in forest and tribal areas with poor transport linkages have traditionally depended on dried or salt-dried fish.

A study by the Post-Harvest Fisheries Project (PHFP, undated b: 14–19) provides data on market channels for different traditional fish products in Orissa. It mentions Humma, Rajshunakala, Bhadrak and Remuna as the main markets for dried fish. The location of some of the important dry fish markets at the 'gateways' to the hinterland indicates how important this demand is to the processed fish trade.

XIM (1991: 47) provides data on destinations for different fresh fish. Kolkata/Howrah and Delhi are the biggest buyers of fresh fish from Orissa (Dahl and Forsgren, 1988: 37). Chennai is the other important market for fresh fish. The main market for fresh tuna, shark meat, sardines and mackerels landed in Orissa is Kerala (Frej and Gustafsson, 1990; Ogrelius and Larson, 1993; Pritchard *et al.*, 1995).

More than 92 percent of the shrimp produced in the state are exported abroad or to other states (DOF, 1998: 14). The main international markets are Japan, the Middle East, Southeast Asia, the United States and Western Europe (Marine Products Export Development Authority – MPEDA, 1995: 2a; DOF, 1998: 76). The high demand and prices for these products have stimulated an efficient marketing and transport system. Exports are mainly sent through Paradeep, Kolkata and Visakhapatnam, but the exports from Paradeep were curtailed from 1992 to 2000 owing to inadequate supplies. In 1996/97, Visakhapatnam handled 75 percent of the exports from Orissa.

Trends in the export of different varieties are not known. In 1992/93, prawns constituted 97.5 percent of total exports (DOF, 1993: 16; DOF, 1998: 72), but their contribution fell to 77 percent by 1996/97. During the same period, the total volume

TABLE 9
Monthly per capita consumption of fish in Orissa

NSS rounds	Rural		Urban		No of households per 1 000 reporting consumption of fish	
	Quantity (kg)	Value (Rs)	Quantity (kg)	Value (Rs)	Rural	Urban
43rd Round (1987/88)	0.20	2.33	0.32	4.76	517	614
50th Round (1993/94)	0.29	5.63	0.30	8.13	586	637
55th Round (1999/2000)	0.31	7.77	0.35	12.68	701	717

Source: NSS, cited in DOF, 2002: 8.

of exports more than doubled, indicating an increased export of other varieties of fish from the state.

Importance of fisheries to the state economy

The Ninth Five-Year Plan of the Government of Orissa recognizes the crucial role that the fisheries sector has played in generating income and employment in the state, and places adequate emphasis on improving the employment potential of the sector (Government of Orissa, 1997: 1/9).

Fisheries and domestic food security

Traditionally, fish has played an important part in the diet of the Oriya people. Along with West Bengal and Kerala, Orissa is considered to have the highest per capita fish consumption in the country. Like West Bengal, but unlike Kerala, the preference of the Oriya people is for freshwater fish, and consumption of marine fish is, at best, an acquired practice.

Of the total 125 000 tonnes of freshwater fish produced in Orissa in 2000/01, 95 percent, or 119 000 tonnes was consumed within the state. For marine fish, consumption within the state was a little less than 50 percent of total catch (DOF, 2002: 3 and 7). Marine consumption rose by a factor of 2.85 from 1985/86 to 1996/97, whereas for freshwater fish it was 4.33. There are indications that the cost of marine fish in the state has grown less rapidly than other non-vegetable sources of protein. It is possible that the relative affordability of marine fish encouraged more people – especially poorer consumers – to begin consuming it (XIM 1991: 53). The annual per capita consumption of fish grew through the 1990s – from 2.85 kg in 1985/86 to 8.60 kg in 1997/98, with a slight dip subsequently (down to 7.71 kg in 2000/01). During the late 1990s, consumption levels appeared to have levelled off, and even the quantities of marine and freshwater fish exported to out-of-state markets showed a marked decline.

National Sample Survey (NSS) Programme data also showed an increase in monthly per capita consumption of fish in rural and urban areas of Orissa (Table 9).

There was a decline in the consumption of brackish-water fish, perhaps due to a decline in production from the brackish-water capture fisheries at Chilika Lake. Brackish-water culture species – i.e. shrimp – were almost completely exported abroad and were cultured to earn foreign exchange rather than to ensure food security within the state (DOF, 1998: 14).

Income and earnings in the fishing sector

Data on income earnings by different stakeholders in the fishing sector are not available. Collection of such data is complicated by the largely unorganized nature of the sector, dispersed landings spread over vast areas of the coastline, and seasonal differences in incomes and migration (both occupational and geographical). A few studies (e.g. Dahl and Forsgren, 1988; XIM, 1991; and Ward, 2000) have attempted to develop indicative earnings of different stakeholders from the activity, with mixed results. There have

TABLE 10
Contribution of fisheries to the state economy

	1990/91	1991/92	1992/93	1993/94	1994/95
Net state domestic product (in lakhs)	966 428	1 250 530	1 341 553	1 586 130	1 896 025
Income from fisheries sector (in lakhs)	17 061	21 073	28 393	36 056	43 678
Percentage contribution of fisheries	1.76	1.68	2.12	2.27	2.30
	1995/96	**1996/97**	**1997/98**	**1998/99**	**1999-2000**
Net state domestic product (in lakhs)	2 327 655	2 218 930	2 743 749	2 985 030	3 272 880
Income from fisheries sector (in lakhs)	44 080	57 422	61 880	60 364	57 523
Percentage contribution of fisheries	1.89	2.59	2.26	2.02	1.76

Source: DES, Orissa, cited in DOF, 2002: 9.

TABLE 11
Exports of fish from Orissa 1995/96–2000/01

Year	Marine fish	Freshwater fish	Brackish-water fish	Total exports
1995/96	71 455	12 194	6 322	89 971
1996/97	73 404	10 183	7 777	91 364
1997/98	83 659	11 421	5 345	100 425
1998/99	68 381	10 875	6 704	85 960
1999/2000	69 914	9 984	4 436	84 334
2000/01	61 755	6 256	7 070	75 081

Source: DOF, 2002: 6.

been many changes in the system since some of these studies were completed, and much of the information needs to be updated before it can be used.

Contribution of fisheries to the state economy

The contribution to state domestic product is growing (Table 10).

Foreign exchange earnings from seafood

In Orissa, there has been an increase in the export of fish and fishery products to both out-of-state markets and abroad. In 2000/01, total fish production of the state was valued at Rs10 458 million and the earnings from exports to other countries amounted to Rs3 800 million or a little over 30 percent (DOF, 2002: 6 and 74). In comparison, the value of exports in 1992/93 was about Rs900 million or 24 percent of the total production of the state (DOF, 1993: 13 and 76), indicating that exports were becoming increasingly important to the state's economy.

However, there are indications that the quantities of fish and shellfish exported from Orissa (to both export and out-of-state markets) are stagnating or even declining (Table 11).

CHAPTER 3

Livelihood groups in the marine fisheries sector in Orissa

The marine fisheries sector in Orissa is perhaps unmatched elsewhere in India in term of its diversity. The great heterogeneity of livelihood systems in the sector is a result of the differences in geographical and linguistic origin of the people, the nature of the habitations and work environment, and social and cultural factors (such as integration into mainstream society and gender roles).

Unfortunately, this complexity means that many facets of the lives and livelihoods of fishers are largely unexplored or underexplored, and it remains a challenge to develop a full picture of the sector and the players within it. These groups, representing linguistic, geographic or occupational minorities, are also often the poorest and the most invisible in the sector. Several categories of people in the fisheries sector, particularly those in ancillary occupations such as processing, transport and trade, are practically unrecognized as fishworkers. No information exists about their numbers, geographical spread and socio-economic status and function, despite the fact that they often make up the largest contingent of people. This lack of information is reflected in poor policy responses to their needs and ignorance about the possible impacts on them of policies targeting other groups within and outside the sector. It is vital to develop a more comprehensive understanding of the various categories of people.

Tietze (1985: 80) distinguishes five functions in the division of the traditional fishing economy: (i) production, i.e. catching fish; (ii) processing; (iii) marketing; (iv) finance and credit; and (v) manufacture of the means of production, e.g. boatbuilding, engine repair and net making. Obviously, in some cases, these functions are interwoven and performed by the same category of people; in others, they are separate and performed by different groups, depending on the stage of development of particular communities. While production activities are largely carried out by traditional fishing communities, which are generally caste-based, shore-based activities are pursued and even dominated by people of non-fishing castes.

PRODUCERS

Marine fishing in Orissa is almost entirely carried out by men, while women's role is confined largely to post-harvest or other shore-based activities.[3] DOF (2000: 8) distinguishes five categories of fishing systems in the northern zone, which are ranked according to the socio-economic status (low to high) of the people operating them as follows: (i) non-mechanized boats, (ii) motorized boats (called *bhutbhuti*), (iii) small trawlers, (iv) large trawlers and (v) deep-sea trawlers. Almost 90 percent of the owners of the traditional non-mechanized boats are considered poor, with an annual income of less than Rs8 300 annually.

In the southern zone, the hierarchy of producers according to the fishing systems they operate is as follows: (i) wooden catamarans (called *teppas*); (ii) wooden boats with engines; (iii) FRP catamarans; (iv) FRP beach landing craft; and (v) mechanized boats (small trawlers). Aside from the wooden catamarans, where owners and crew

3 Women are also involved in creek- or shallow-water-based operations, such as crab and shell fishing, and rarely in cast net operations.

have roughly the same social and economic status, these systems are all characterized by a marked distinction between owners and crew.

Fishing crew

Fishing crew consist largely of poor fishers, who depend on a share of the catch for their income. Their socio-economic status is comparable to that of workers without assets in other sectors, with the difference that whereas the ownership of agricultural land is important for a farmer, for fishers it is the *means* of extracting the produce, in other words access to the craft or gear, that is important. In capture fisheries, which depend on open access to natural resources, ownership or availability of the resource itself is less significant than the means of *access* to the resource and the *ability* to extract it. This in turn is dependent on fishers' capacity to invest in a fishing system. Those who cannot afford to invest in a means of production and hence work on others' boats have little say in deciding operations or the sharing patterns.

Fishers working in traditional – non-motorized – catamarans or dinghies are considered to be the poorest among the different categories of the fishing crew, and those working on mechanized trawlers are considered to be better off, if only because they receive a fixed monthly wage. Being bound to the boat on an annual basis, crew members have little scope to diversify activities and often do not possess any other skills. Spending a large part of their lives away from the land, chasing a fugitive resource, induces habits that include drinking and, when on land, extravagance.

There is a significant difference in gender patterns between the families of boat owners (where the women may not always take on productive functions) and those of the crew (where women are generally involved in a range of livelihood activities).

Boat owners

Boat owners in the mechanized and motorized categories fall into a class distinct from the crew. In both cases, sizeable investment is required to acquire a boat, and each fishing operation requires some working capital. Thus it is the more affluent (or, in the early stages, more enterprising) people that can afford to invest in these systems. The need for investment is matched by the high level of risk, and this naturally means that the owner-crew relationships in these systems tend to be largely capitalistic. A boat owner seldom goes fishing himself, particularly in the mechanized sector, where boats are sometimes owned by people from non-fishing backgrounds, who are more concerned about returns on their investment than about equity and sustainability. High investment and recurring costs dictate that these fishing systems maximize their returns at *any cost;* thus these fishing systems tend to concentrate more on export or high-value species such as shrimp.

Beach-seine owners and crew

In 1984 there were a total of 632 beach seines in the state (BOBP, 1984a: 10). These were spread along the coastline and were generally owned by collectives of fishers (although individual/family ownership was also common), who also contributed to their operations. The number of beach seines has dwindled in the last two decades because of increasing non-viability of operations. Each net provided direct employment to 40 or more people, besides a number of ancillary workers, and it is likely that several people found themselves unemployed when the beach seines went out of business.

Bedha jal (encircling net) fishers

Encircling nets – called *bedha jal* – used in intertidal areas are common in the northern zone. *Bedha jal* was an important fishing system until 30–40 years ago, and many villages depended entirely upon it. Recently, it has become a source of livelihood for the old and physically weak fishers, who are unable to undertake sea fishing. About

10–15 fishers contribute a piece of net each; the pieces are then joined together in a circle covering a patch of the intertidal area. As the water recedes during low tide, fish are caught in the nets. Access to the intertidal zone, which was considered the common property of villages adjacent to it, has come to be controlled by the Revenue Department, which increasingly leases it out in open auction to anybody, including non-fishers. The fact that there are few interested participants at these auctions – even the number of fishers bidding is reported to be decreasing – is a sign of the non-productivity of this kind of fishing. *Bedha jal* has now come to be identified with poor people to the point that anybody engaged in it is automatically considered poor.

Cast net/push net fishers

Cast or push net fishers are often very poor people, who operate in creeks and rivers, casting nets out from the shore. This activity is usually carried out at a subsistence level. In the northern zone, e.g. in Khairnasi, women fish in the creeks with small push nets for crabs and estuarine species of fish, mainly for family consumption. Men use larger push nets and part of the catch is also sold. In the Astaranga area, people of the 'scheduled castes' engage in part-time cast net fishing. The catch contributes to the family kitchen, and surplus is sold in local markets. In Paradeep, Bengali fishers use cast nets in rivers and creeks adjacent to the Bay of Bengal. Similarly, in Ganjam, a number of people fish near the river mouths of Bahuda with cast nets.

Shell collectors

Shell collection is an important activity in Ganjam and parts of Puri, particularly in the Chilika Lake-based villages, where shells are manually picked from the river mouths and creeks. In the northern zone, where intertidal fishing is common, shell collection is extensively practiced in several villages, almost entirely by women and children, with some old, 'retired' men fishers occasionally joining in. Shell meat is used in aquaculture farms, while the shells are used in cement and ornament industries. The Revenue Department gives rights for shell collection to the village committees or to outsiders on payment of a fixed sum as annual lease. In some villages, e.g. Anantarayapuram in Ganjam district, shell meat extraction and trade provide livelihoods for a sizeable number of people, who do not collect shells themselves but take part in processing and trading activities.

Crab fishers

Crabs of many varieties – particularly mud and spotted crabs – dominate catches in the estuarine areas. Chilika Lake is an important source of mud crabs and sizeable quantities are also landed in the estuarine areas of Kendrapara district. Women from villages such as Gobardhanpur, Jamboo and Kondrapatia are involved in capturing crabs, often with their bare hands, in the creeks of the Mahanadi and other rivers.

Aquaculturists

In the northern zone, pisciculture is a traditional household activity, with most families having their own aquaculture pond in the backyard. The economic status of a family is determined by the number and size of ponds it owns.

Traditional fishing cooperatives in Chilika Lake obtain annual lease rights for extensive aquaculture operations using the Gheri system. The Revenue Department determines the leasing pattern and collects lease payments through the Chilika Development Authority. Many cooperatives illegally lease their fishing rights to outsiders in return for a fixed payment.

Many small- to medium-scale aquaculture farms for shrimp have started in the coastal areas. The northern zone has the largest concentration of aquaculture farms. In the southern zone, they are concentrated around Chilika Lake. The World Bank-aided

Special Projects Unit of DOF leased small areas of land to people belonging to weaker sectors and to entrepreneurs (DOF, 2002: 45). The National Bank for Agriculture and Rural Development (NABARD) and MPEDA also supported brackish-water aquaculture by providing loans, subsidies and training to farmers.

Field studies indicate that small-scale fishers who entered aquaculture soon moved out, due to their inability to address the technical, financial and marketing demands. In northern-zone villages such as Mirzapur, large areas developed for aquaculture by outsiders were found abandoned as a result of recurrent problems with viral diseases and other losses. Some fishers have leased these lands to grow shrimp using extensive systems of culture and keeping costs very low in order to break even.

Aquaculture workers

In many places, aquaculture labourers come from neighbouring fishing and agricultural communities. However, it was also observed in some places that aquaculture owners, who were usually outsiders, employed people from inland areas (tribal people, agricultural workers, etc.) for manual work and for 'watch-and-ward'. These outside labourers are usually from very poor households. They tend to remain socially isolated, as they are actively discouraged from mixing with the neighbouring villagers. They are allowed to return to their homes for a few months a year, but are otherwise cut off from their people.

Shrimp-seed collectors

Shrimp-seed collection as a livelihood activity has mushroomed in the wake of the growth of aquaculture in various parts of the coast. Thousands of men, women and children – and often older people – engage in this activity of supplying juveniles for culture purposes. Fishworkers with no assets, for whom fishing became unviable because of a decline in fish catch or a reduction in the number of fishing boats, also join this activity in large numbers. Invariably, in all wealth ranking exercises, shrimp-seed collectors were identified by villagers as among the poorest and most vulnerable groups in the sector.

Alarmed by the destruction of large numbers of non-target species in the process of shrimp-seed collection, the Government banned the activity under the Orissa Marine Fishing Regulation Act. However, despite concerted efforts by DOF, and the help of the police and the Revenue Department, shrimp-seed collection continues in many parts of the coast. This study found that shrimp-seed collection has become a livelihood of last resort for some of the poorest people in the sector, who stand in urgent need of viable alternative options in order to give up this activity.

TRADITIONAL FISH PROCESSORS

In Ward's profile (2000: 20) of the small-scale fish processors of Orissa, 95 percent were women, who often knew no other trade. The ease of entry into processing activities, the lack of alternative income-earning opportunities and the fact that processing could be carried out close to home were some reasons why women readily undertook this activity. Most small-scale processors use from Rs500 to 3 000 as working capital. A sizeable number of processors belong to households with no adult men. The processors face increasingly stiff competition for fish from large-scale processors and fresh fish traders, made more acute by the decline in landings and the increase in numbers of processors in some villages.

In the northern zone, fish processing is generally carried out by men, with the help of women. Kalavathy (1997) ascribes the trend of Oriya women taking up processing work in some places, e.g. Astaranga, to the influence of the nearby Telugu processors. In some northern villages, notably around the Balaramgadi fishing centre, several Muslim families are involved in fish processing with the active participation of women.

Most fish processors prepare fish primarily for human consumption and secondarily for fishmeal. Some people, though, are exclusively involved in fishmeal production and trade. They are generally located near the port area, where trawl catch lands. Because they deal in large quantities of putrid or otherwise smelly fish, the fishmeal manufacturers are often kept at a distance or even banned from making fishmeal.

Shrimp peelers and graders

Traditionally, peeling and grading is done by young women from Kerala, who are brought in in large numbers by contractors to work in shrimp processing plants. They constitute another 'perpetual outsider' group in the sector and face a number of problems, including very poor living conditions. Of late, local women have been trained and employed as peelers, gradually moving up to grading and processing activities, but the young women of Kerala continue to dominate shrimp grading operations.

There are very few peeling sheds in Orissa, but peeling is an important seasonal activity for women in some fishing villages, particularly those close to a major trawl harbour.

DISTRIBUTORS/TRADERS

Several of the people and activities in this category remain unreported in the available literature, although they constitute – numerically – the largest sector of those involved in fish marketing systems.

Head-load traders (women)

In the northern zone, a few women – particularly widows – sell fish door-to-door by head loads, but these sales are confined to the villages. In the southern zone, women head-loaders constitute the largest number of traders seen at the beach, although they account for only a small percentage of the catch in terms of value. They are a major source of fish supply for communities within and close to the coastal areas. In all villages, many changes were reported in the composition of fish sold by these women. Many varieties have become scarce or expensive, and cheaper varieties such as ribbonfish are not available through petty traders. The biggest competition for this category of traders came from cycle fish vendors, but in recent times, large-scale traders and commission agents have become a bigger threat. At the same time, the number of women involved in fish processing and trade has increased, for reasons to be discussed in the following chapter.

Bicycle fish vendors

Bicycle fish vendors easily dominate the proceedings at many landing centres, outnumbered only by the women head-loaders. Cycle traders come from different villages and prefer to do their business individually, with the result that they lack collective strength, despite their large numbers. This often hampers their ability to purchase fish efficiently. Some of the cycle vendors have recently shifted to motorized two wheelers, which make their work much easier but add to their expenses.

Petty sellers trading fish in kind

These are among the poorest people in fishing villages in both zones and consist mostly of older women. Their investment is very low – less than Rs50 or sometimes close to nothing – because they procure fish in exchange for edible items such as boiled tubers, sweet corn, sweets and fruits. They then carry the fish to the markets for sale. People in fishing villages often had a poor understanding of this livelihood activity and its characteristics.

Resellers

With increased demand for many varieties of fish, many fishers have taken to procuring fish as agents for outside traders. A majority of these resellers, who are often women,

are considered very poor. This occupation allows them to earn a living without investing any money as they frequently collect money from the buyer *before* making payments to fishers. Their role is confined to participating in auctions, buying fish and handing it over to traders in return for a commission.

Commission agents

Both the commission agent and the middleman-trader are relatively new phenomena. They arrived on the scene only after the shrimp export markets began to grow. The increased demand for fish during the late 1980s and early 1990s led to a reorganization of fish procurement and trade networks and encouraged many fishers to set themselves up as middlemen, procuring fish for outside traders and processors. All commission agents are men, most of them from the local community. Some of them even hold influential positions in traditional or modern systems of governance in the villages. Large numbers of such commission agents exist in each village, although overt competition is avoided by the formation of local cartels.

Each commission agent has an arrangement with a particular company, which sometimes provides soft loans with which to procure shrimp from individual fishers on its behalf. The commission agent uses the money or inputs to make loans to fishers in return for their catches. For fishers, the advantage of working with the commission agent is that he buys their product immediately after landing, thereby relieving them of the responsibility of carrying it to a distant market. Frequently, the commission agent also lends fishers money during lean periods and for production and consumption needs. Considering that this kind of assistance is not forthcoming from other sources and that the interest is collected in kind, fishers are willing to forego a part of their income for this facility.

Independent traders

These are generally local people with enough money and experience to begin trading on their own, and their modus operandi differs only slightly from that of the commission agents. They extend interest-free loans to fishers in return for their produce, but unlike commission agents, they are not indebted to processing or exporting firms and can sell their material to anyone who offers the best price. For fishers, the advantage in dealing with independent traders is that once the catch is handed over to them, it ends their transaction, whereas when they sell to the commission agent, they are not paid until he sells it to the company, which usually takes about a week. However, selling to independent traders fetches much lower prices than those offered by companies.

Besides shrimp, large traders also purchase commercial varieties of fish such as seer and pomfret, which are packed in ice in baskets and plastic crates and transported to urban markets.

OTHER PARTICIPANTS IN THE FISHERIES SECTOR

There are many small-scale operators involved in the transfer of fish between vessels and the shore and between landing centres and processing plants.

Carriers and head-loaders

These constituted a specific group of people seen mostly in trawler landing centres. Although sizeable in number and often working in groups, they remain largely unnoticed because of their involvement in 'link' activities that have no direct relevance for outsiders. Their role is confined to carting fish from the boat to the auction centre by head-loads or in baskets slung from a long pole carried by two people on their shoulders. They are paid a fixed sum per head-load or basket or sometimes have an arrangement with boat owners to transport a day's catch for a bulk sum. In the northern zone, they also carry fish from auction halls to godowns where they assist in

packing and loading them into trucks. In the northern zone, the carriers and sorters are all men, while in the southern zone they are mostly women. At the landing centres and processing plants in the southern zone, head-loaders carry fish to and from trucks or other venues. In Pentakota, nearly 200 women – mostly young – are engaged in carrying fish from landing centres to icing and packing sheds and are paid a piece rate by the basket.

Auctioneers and assistants

Auctioneers do not trade fish themselves, but arrange the sale through an auction or bargaining system and charge a fixed sum or a percentage for the service. Auctioneers generally belong to the fishing community and often come from the same village as the sellers. In some villages, the auctioneers pay a certain fixed amount or a portion of their daily earnings to the village for the right to auction. In the southern zone, many auctioneers can be found at landing centres and fishers can engage their services if needed (XIM, 1991: 41). In Chandipur and Paradeep, auctioneers function as agents for boat owners and take responsibility for collecting money from the buyers. In the northern zone, auctioneers employ a large number of people to weigh the fish before auctioning and also to recover money from buyers.

Miscellaneous workers

Village-level procurement and packaging operations require a set of people to assist the commission agent/trader. Depending on the size of the operation and the availability of fish, each agent/trader employs a number of people on a regular basis or for daily wages.

Ancillary participants in the sector include ice plant owners, who tend to operate on a relatively large scale, and ice sellers, who operate on a smaller scale. Transporters are an important category of ancillary participants. They provide bus services, cycle trolleys and rickshaws for transporting fish and fishers, and insulated or covered trucks for large-scale transport. Although there is no record of the total number of trucks involved in transporting fish, a large number of people earn livelihoods as drivers, assistants and mechanics.

Net making was found to be an important livelihood activity in most fishing villages, especially among women and 'retired' fishers. The arrival of synthetic fishing gear enabled fishers to buy nets 'off the shelf', rendering net makers in villages redundant. In some villages, women continue to make a living repairing nets. This allows women in predominantly Muslim villages such as Mirzapur to pursue their livelihoods without leaving the house.

All large- and medium-scale fish processors periodically employ assistants, usually neighbouring housewives, on an informal basis. In many villages, fish processing is a social activity, providing women with opportunities to interact with one another. Assistants are usually paid in cash, but sometimes in kind with unused portions of fish such as the intestines. With a decline in fish processing operations and with many large processors sliding down the scale to small or irregular processors, the need for and the ability to employ assistants has diminished. The general trend of women dispersing out of the fishing sector into a wide range of non-fishing activities began with these processing assistants moving out in search of work, followed in due course by the processors themselves.

Traditional boatbuilders are another specialist category of people who found themselves out of a job when new boats such as the FRP versions of indigenous craft arrived on the scene. With the growing shortage of wood for boatbuilding, these groups would still have found their livelihoods dying out in due course, but the new boats hastened the process. Engine mechanics are a significant group in villages where motorized boats are operated. They are usually located in a central village or town,

and fishers from neighbouring villages bring engines to them for repair. There are also itinerant mechanics, who visit villages at the request of fishers and carry out repairs in situ.

Basket weavers are a specialist community. They use a wide range of local materials such as Palmyra leaves and bamboo to make baskets and other equipment used in fishing and post-harvest operations. With the increased availability of more robust plastic containers, which store fish better, large numbers of the basket weavers that relied on fishers as customers have lost their livelihoods.

Several new categories of workers have emerged in the rapidly unfolding cold chain activities, but the new opportunities have not compensated adequately for those that were lost.

POOR STAKEHOLDER GROUPS IN THE FISHERIES SECTOR IN ORISSA

The findings of this study support the view that the majority of people involved in artisanal or traditional activities in the marine fishing sector are poor. A small proportion may be categorized as well off, including trader-financiers, commission agents and some boatbuilders, but most livelihoods at best provide subsistence earnings that are subject to seasonal swings and shocks.

This does not imply that participants in the mechanized sector are rich or even well off. In fact, there are indications that here, too, a majority of livelihoods are tenuous and vulnerable to factors outside the control of even the most affluent boat owners.

Large numbers of ancillary workers in the fishing harbours depend exclusively on trawl landings in various ways (both direct and indirect) for subsistence earnings. As the artisanal sector begins to confine itself to specific varieties of fish and shrimp, landed in a few well-connected landing centres, fishing harbours have begun to teem with poor people seeking to scrape a livelihood from the large bycatch that characterizes mechanized fishing operations.

CHAPTER 4

Livelihood analysis of coastal fishing communities

To understand the links between livelihoods and issues of poverty and vulnerability, one needs to analyse the traditional livelihood strategies of fishers and how they have changed over time based on changes in their asset base. These changes in turn can be accounted for by the vulnerability context in which fishers live and work, as well as by the policies, institutions and processes that influence this context.

The following analysis discusses a range of issues relevant to the livelihoods of coastal fishers, and in turn forms the basis for developing a broad set of indicators of poverty, food insecurity and vulnerability in the following chapter. The issues are often overlapping or intersecting and their organization under different headings in the analysis below is dictated largely by convenience.

FEATURES RELATED TO LIVELIHOODS AND LIVELIHOOD STRATEGIES

Shift from subsistence-based occupations to commercial transactions

The argument that fishers should not find it difficult to adapt to liberalized markets because they have always worked in a market economy masks a serious difference between the traditional 'market economy' and the later version. The artisanal fishing economy was one where the means of production were in the hands of 'freely associated producers,' whose shared – if low – investment assured them control over sales and over the proceeds. In the new economy, the means of production and their modes of utilization are dictated and controlled by others. Decision-making is taken away from primary producers, although some of the second-level decision-makers also often come from within the fishing communities.

Literally speaking, fishing is not a 'subsistence' activity, as people cannot live on a diet of fish alone. What is implied in designating artisanal fishing as a subsistence occupation is that the products of the activity – fish or other commodities procured in exchange for fish – are just sufficient for a family to subsist. Subsistence fishing usually involved a one-time investment in a boat and net, with human skills and labour providing the 'working capital'. As Paul Alexander (1995: 193) argues, the fish that left the village represented the surplus, after consumption needs of the producers were met. Although there was an increasing dependence on adjacent villages for basic foodstuffs, this did not lead to market-oriented fishing, as transport and preservation challenges limited the size of potential markets, and low margins provided few incentives for the entry of large-scale fish traders.

In commercial fishing, on the other hand, investments are made in order to maximize returns, and large surpluses lead to economic polarization. Business enterprises almost by definition cover their risks by extracting the maximum profit within the shortest possible time. This often entails ignoring the complex lifecycles within the aquatic ecosystem as well as the relationships to them that various categories of people in the fishing sector have developed.

The emphasis of modern fisheries development has been on commodities rather than on people, with the result that some activities traditionally carried out by artisanal fishworkers have been taken over by new groups, while others have been rendered redundant. A major change that has occurred in Orissa's fishing sector over the last two decades is a clear shift from subsistence-based artisanal occupations to profit-oriented,

business transactions, often (and increasingly) owned and managed by people from a non-fishing background. Between these two extremes lie many intermediate stages characterized by different levels of access to or availability of assets.

A number of species on which communities depended have become 'dispensable'. Fishers concentrate on high-value species, using specialized fishing gear, and ignore cheaper varieties or discard the bycatch as trash. Passive gear have given way to active fishing practices, a process that gains momentum as fish catches show a declining trend. The result is an increasing capture of juveniles. Johnson (2001) comments in the context of Gujarat fisheries that "The modernization model of fishing that has dominated fisheries development since the 1950s has helped generate deeply wasteful practices. There has been the obvious material waste of unsustainable fishing practices but also the waste entailed by the marginalization of indigenous social, cultural and economic practices related to fishing." These comments apply to the case of Orissa as well.

Income and earnings from traditional livelihoods

Poverty and vulnerability are direct outcomes of insufficient or barely sufficient earnings from fishers' current livelihoods. Boat owners obtain bigger shares of the catch; this provides them with some buffer during lean periods. The boats themselves are assets that insure them against future emergencies. Fishing crew have no such security. They obtain a share of the catch when they manage to go fishing and land a catch, both of which are events beyond their control.

Fish traders can be fairly easily classified into rich and poor by virtue of the investments involved. The hierarchy begins with traders, who deal in export varieties of fish, and proceeds downwards to the petty fish traders, who buy and sell fish in cash or kind entirely within the local area.

For many stakeholders, current levels of wages or earnings from fishing and trade leave very little surplus beyond their subsistence needs. Even households that generate some surplus use it up quickly during lean periods or spend it on repairs to boats and houses or for weddings and funerals. When the surplus is spent, or when the fishing season itself is disappointing – an increasingly common occurrence – fishers have recourse to credit at high rates of interest by pledging their future fish catch. Many are forced to diversify, move out temporarily or sell assets. In the worst cases, they simply starve.

Fishers get trapped in an endless and hopeless cycle of debt as their borrowing progressively overwhelms their capacity to repay. Up to 90 percent of households in a typical fishing village remain in debt for a good part of the year. While poverty has always defined most fishing-based livelihoods, it is now compounded by vulnerability. As fishers face increasing days of poor catches or no fishing opportunities at all, many fishing households report an increase in the number of days that they go hungry.

The lack of a surplus is most acutely felt in old age or when the earning member of the family dies suddenly. For many households, such circumstances spell a descent from the category of 'the poor' (i.e. with income barely sufficient for survival) to 'destitute' (i.e. no certain source of income, exposed to social rejection and frequent hunger).

Diversified livelihood profile in fishing communities

Recent changes in regimes of access to traditional resources are beginning to have profound impacts on coastal livelihoods. The coastal poor are characterized by their dependence on multiple livelihood strategies involving other natural resources besides fish. Some groups made their living off such resources as mangrove forests. The curtailment or restriction of access to these resources for conservation purposes has cost these people their livelihoods. Faced with starvation, many are forced to continue fishing or gathering in natural reserves such as mangroves, or in the nesting areas of

threatened species such as Olive Ridley turtles. Clearly, the imposition of a ban without considering its impact on traditional dependents of the resource only encourages them to subvert the ban.

Fishing communities in the northern zone traditionally pursued multiple occupational strategies, with fishing often representing a secondary option. In this zone, there appears to be an increasing trend to move back into agricultural activities.

In the southern zone, diversification is a relatively new phenomenon but its significance cannot be overemphasized. Increasingly, fishing or fish-related occupations account for only a portion of a household's income, although this may still be substantial. Diversification to other areas (geographical migration) or to other occupations (occupational migration) is occurring both at the household level (i.e. among different members of the household) and at the individual level (the same person participating in different activities at different periods of the year). Many households depend on income from at least two earners to make ends meet, and it is not unusual for a family of six to be simultaneously involved in four different occupations. The burden of running a family frequently falls heavily upon women. During some parts of the year, entire villages depend on women's earnings from wage labour or from the production and sale of vegetables, poultry, livestock or dried fish.

Some new occupations have arisen from the close relationship that exists in coastal areas between natural assets and the livelihoods of poor people. Thus fishers in Pentakota have begun to work in cashew-nut plantations simply because cashew nuts are the second most important product – after fish – of the coastal area in this zone. But by and large, occupational migration is 'forced', and fishers have little choice but to move out in search of alternative options, however ill-fitting and low paying. Studies in the Puri (Chilika area) and Ganjam districts indicate that most coastal villages in the area lack employment opportunities (Salagrama and Mahapatro, 1998 and 1999). The current study also found that few sustainable income-generating opportunities exist as alternatives for coastal communities.

Ultimately, fishers adopt new livelihood activities from the extremely limited options available to them, with little consideration for their potential impact upon the natural and social environment. Fishers' recourse to clearly unsustainable and illegal practices is on the increase. Although many of them understand the negative implications of some of their activities, they appear to have very limited choice in this respect.

Moreover, occupational migration is never easy, because fishers have to compete with the skills and abilities of more experienced traditional workers in the sectors they enter. The large influx of workers into agriculture and port-related activities in many areas has caused the depression of wages, adversely affecting traditional labourers in these sectors. These developments have affected fishers' fragile relations both with their natural resource base and with other communities, sometimes creating hostile environments, particularly where fishers constitute a minority. Thus migrations of this sort can create profound disruptions in social relations among and within villages.

Diversification appears to be taking place among the better-off fishers, too. As their capital accumulates, these fishers diversify their investments into entrepreneurial activities such as fish trading, boatbuilding, engine spare-parts dealerships, ice plants, agriculture and tourism. Fishers classified by the community as boatbuilders were seldom found to be entirely dependent on fishing activities alone.

LIVELIHOOD ASSETS OF THE COASTAL FISHERS IN ORISSA

Availability of and access to natural assets

There are both formal and informal systems governing fishers' access and use rights in relation to natural assets. Different households in a village or even different members of a household have varying access to these assets, and this in turn determines their social and economic conditions.

Status of the natural assets on which fishers depend

The most important natural asset on which fishers depend is fish. They also depend on a range of other local natural assets. Evidence suggests that the natural ecosystem in which a community resides has a strong bearing on the quality and diversity of its livelihoods.

The most important factor responsible for the increasing levels of poverty, food insecurity and vulnerability in the fishing communities of Orissa is the steep decline in fish catches experienced over the last decade. This trend was borne out in all the fishing villages where field studies were carried out, and fishers across the sample unanimously validated it from their own experience. In some villages in Ganjam district (Salagrama and Mahapatro, 1998: 1), they estimated declines as high as 90 percent from the previous decade. The fall in catch has affected everyone in the sector. The duration of fishing expeditions and distances travelled in search of fish have increased at least two-fold. Fishing expenses for a given quantity of fish have increased three to four times. Other perceived impacts include increased movements out of the fishing sector, growing unemployment, degradation of habitat, the pursuit of destructive or illegal activities, growing poverty, reduced food security and marginalization of livelihoods. Women who processed fish obtained 90 percent of their income from this activity until five years ago, but now it yields only 50 percent of their income, the rest coming from other, often non-fishing-related activities.

The perception of decline in marine fish catch was more pronounced in the southern zone than in the northern one. This may be due to the near total dependence of communities in the south on marine fishing, whereas in the north it is a more recent and even secondary occupation (Box 2).

Mishra (1998: 81), BOBP (1994: 164) and Parasuraman and Unnikrishnan (2000: 184) discuss the loss of biodiversity, including in fisheries, in the coastal areas of Orissa. Interactions with fishers provide good indications of the decline or total disappearance of some species that were once widely prevalent. While some of these changes are specific to particular locations, there are a number of species that appear to have declined uniformly across the state. That the declining species are often from commercially important categories indicates that overfishing might be at least partly responsible.

A third aspect of the decline in fish is the increasing uncertainty it has engendered. Seasonality strongly determines the way fishers conduct their operations and order their lives around peak and lean fishing periods. Availability of different fish in different seasons enabled fishers to budget their incomes and expenditures over the year. However, the availability of particular fish at given periods of the year is no longer assured, with the result that sudden bumper harvests of shrimp are known to find fishers and their support systems completely unprepared and to bring more loss than profit.

Habitat destruction

BOBP (1994: 154–168) provides an overview of environmental conditions in Orissa, with an emphasis on marine pollution and its causal factors, including domestic waste, industrial effluents and agriculture. Both Bhitarkanika and Mahanadi mangroves are now degraded as a result of their conversion into paddy fields and aquaculture ponds. A recent report of the Zoological Survey of India warned of the presence of toxic heavy metals such as copper, zinc, lead and nickel in Chilika Lake (Mishra, 1998: 82).

The discharge of industrial and agricultural effluents into rivers and creeks was mentioned as a serious problem in several villages, particularly those based in estuarine ecosystems. Within the last five or six years many chemical industries have been established in coastal areas. They frequently release effluents into the sea through creeks and rivers, affecting fish populations and other aspects of biodiversity. Many fishers in Kendrapara district complained about the frequent and large-scale fish kills

BOX 2
Impact of declining catch

The impact of declining fish catch is most tellingly felt in Pentakota in Puri. Unable to repay the accumulated debts, several fishers are reported to have decamped surreptitiously with their families and resettled in distant states. It was reported that a few people died heartbroken over the loss of their livelihoods. There were also some suicides reported. Perhaps for the first time, men started working in the neighbouring cashew-nut plantations. While women have been working in occupations outside fishing for over a decade now, the movement of men into non-fishing-related activities had been rather low key until the present.

that occur in the creeks in which they fish, as a result of discharges by the fertilizer plants and other industries operating in Paradeep.

Forestry, agriculture and livestock, industry, coastal aquaculture, infrastructure development, defence, revenue, tourism, shipping, urbanization and mineral extraction were all reported to be contributing to upsetting the natural ecosystem balance in the area and destroying biodiversity.

Chilika Lake is an outstanding example of habitat loss and destruction. There has been a serious decline in fish catches from the lake. Due to the clogging of channels connecting the lake to the sea, silt is not flushed out regularly. The decreased interaction with the sea has also reduced the salinity of the water, creating another set of problems (Ayyappan and Jena, 2000: 243). The loss of depth has caused a decline in the availability of deeper shelter zones as breeding grounds. Heavy deforestation has increased erosion in the upland areas through which the rivers supplying the lake run, thereby increasing particulate matter in river waters. Mishra (1998: 82) reports that pesticides used in agricultural fields in coastal areas are often flushed into the lake, affecting its biotic life. In addition, agricultural runoffs, industrial discharges and other upstream activities are also identified as causing much destruction (Mishra, 1998: 82). Another factor contributing to habitat loss and destruction in Chilika Lake is the encroachment by shrimp farmers for aquaculture purposes (Ayyappan and Jena, 2000: 243). The productivity of the lake has declined drastically in the last decade, forcing the Government to take serious measures to revive it (DOF, 2002: 48).

Major destruction of habitats occurred as a result of the cyclone that hit the central and northern areas of the coast in October 1999. Besides destroying houses and productive assets, the tidal wave also affected the productivity of coastal areas (Government of Orissa, 2000: 1/10).

Importance of open-access/common property resources to the poor

It is almost axiomatic that the poorer the household, the more dependent it is on a wide range of common property and open-access resources. A large majority of fishers in Orissa are poor and their ability to invest in private property to earn a livelihood is limited. Their relationships with the open-access resources that support their livelihoods vary in quality and quantity at different periods. Thus their livelihoods span a range of activities, frequently utilizing more than one common property resource at any given time. The large size of fishing families can be attributed to the open-access nature of marine resources, as large families facilitate rapid extraction of benefits.

Many activities in artisanal fishing villages continue to depend largely on open-access and common property features of the natural assets. Their access to the sea (for fishing), the beach (for a host of activities including fish processing), village ponds (for drinking water) and village commons (for washing and drying clothes, defecation,

grazing livestock, etc.) depends on these resources continuing to remain open-access or common property, and any changes in these terms of access would automatically exclude the poor from their use.

One important aspect of this dependence on open-access or common property is that while the poor can make a living from them, they do not obtain any security of ownership, tenure or use rights, except perhaps in a customary sense. Tenurial arrangements constantly shift among private, open-access, closed-access and common property, and the livelihoods of the poor that depend on them are seldom secure. The community may view a particular natural resource as open-access or common property after years of customary tenure. Nevertheless, in many cases, its legal status remains obscure or unrecognized until commercial or population pressures or conservation motives bring in private interests or the state to assert – or reassert – their ownership, effectively marginalizing the traditional users.

On the other hand, open access also enables more powerful interest groups to venture into fishing and other coastal activities. The ambiguities inherent in traditional forms of ownership and use rights in an increasingly multisectoral environment – and the lack of official recognition of these arrangements – facilitate the entry of capital-intensive private enterprises. Fishers reported having problems with aquaculturists and shrimp hatchery operators (in Balasore and Bhadrak districts), with industries (in Khairnasi and Gopalpur areas) and with tourism (in Puri and Konark areas).

In order to facilitate industrial growth, the state failed to acknowledge – or actively ignored – the existence of customary codes of practice governing the use of coastal commons and encouraged open access to all and sundry. Private interests and investments demanded security of tenure. Thus land tenure systems changed from open-access/common property to private ownership. Monetization of transactions in the fishing sector put an economic value on the natural resources, bringing further changes in tenurial arrangements governing access and use rights.

The new entrants, with their superior capacity for investment, access to technology and exposure to international trends, were better equipped to exploit the resources, often to the disadvantage of traditional and/or poorer users. In many coastal villages, fishing trawlers, aquaculture and industrial development have been cited as serious problems facing fishing-based livelihoods.

By all indications, this competition from powerful groups is likely to increase as a result of further liberalization of the economy, the shrinkage of areas available for industrial purposes due to population growth, and new opportunities (such as tourism) emerging in coastal areas. Many fishers expressed apprehension that they might eventually be squeezed out of the sector.

Once intensive practices came to be seen as destroying natural ecosystems, the Government stepped in again, claiming ownership of the natural resources and regulating, restricting or closing off their access to everyone, including their traditional users. The problem was compounded by the fact that, in coastal Orissa, tensions exist not only between traditional use patterns and formal systems of ownership and use, but also between different formal systems themselves. There are many players in the coastal environment, each with their own agenda, activities, role and responsibilities, and it is often very difficult to determine their territories.

Frequently, different state organizations sharing the same objectives work independently of one another. For instance, coastal conservation and management programmes are run under various state and central government initiatives, involving the departments of forests, fisheries, environment, industries, revenue, coast guard and tourism, besides a host of quasi-governmental and non-governmental organizations with overlapping roles and responsibilities. In many cases, however, different organizations have countervailing agendas. For instance, one promotes growth and development, while another deals with conservation and management, and a lack

of coordination between them leads to programmes that are at loggerheads with one another. The result is that, in most coastal areas, access to traditional resources upon which the poor have depended for their livelihoods is increasingly curtailed for conserving turtles, mangroves or marine resources, or for initiating oil and gas exploration, or for defence purposes.

Problems also arise concerning the coastline shared by Orissa and neighbouring states. For artisanal fishers in Ganjam district, the encroachment by Andhra Pradesh-based trawlers into their habitual fishing grounds poses serious issues and has led to violent confrontations. The state administration has remained more or less passive in this matter, because it is unable to impose or implement any restrictions or regulations related to marine fishing in the near-shore waters. Fishers are thus left to fend for themselves.

Although marine fisheries have traditionally been free from tenurial arrangements that characterize closed or confined waterbodies (Salagrama, 2003), it is becoming apparent that the dwindling resource position, coupled with competition from external players (such as trawlers), is producing a mentality of protecting 'one's own waters'. Reports from Ganjam district indicate that outsiders are allowed to fish in the sea close to a fishing village only on very limited and conditional terms.

Availability of and access to physical assets

Physical assets related to fishing

Fishing communities and the systems that they develop form an integral and indivisible part of the ecosystem that surrounds them (Tietze, 1985; Tribal Cultural Research and Training Institute – TCRTI, 1965; Salagrama, 2003). This has implications for the community's structure, organization and social mores. The diversity of fishing systems in Orissa reflects the wide range of conditions that exist in different areas of the state, including shallow waters, intertidal areas, reservoirs, estuaries, river mouths, lakes and the high seas. While there are specialized craft for each of these environments, there are also some that are adapted to many environments.

Artisanal 'technologies' grew out of a harmonious interrelationship between humans and their environment, and often represented an optimum mode of resource utilization through local means. In some of these situations, introduction of extraneous technologies could upset the balance. Cognizant of the peculiar characteristics of the ecosystem and their dependence on it, artisanal systems tended to safeguard the sustainability of these ecosystems in their own interests. It follows that any changes wrought in the larger ecosystem would have a direct bearing on the livelihoods and the lives of fishers and *vice versa*.

The fisheries sector in Orissa has undergone rapid changes in the 1990s, particularly in the small-scale category. Changes have been seen in boatbuilding – from wood to FRP (BOBP, 1993); in propulsion systems – from sail power to motorization (BOBP, 1986c); in fishing gear – from organic to synthetic yarns; in net making – from manual to factory-made (BOBP, 1986a); in the specialization of fishing systems – multi-gear, species-specific fisheries (BOBP, 1992); in distances and duration of fishing; and in onboard and onshore preservation and processing systems. In Orissa, the numerous artisanal fishing fleets that existed until the early 1980s have been replaced by fewer but more efficient (and expensive) FRP boats. Although cheaper variants on traditional designs (such as the *katla teppa*) have appeared, their numbers and ownership are not comparable to what existed previously.

Fishers were quick to adopt new technologies when required, often adapting their underlying concepts to their own requirements and to local conditions. There are instances in which fishers showed a better appreciation of the potential of a technology than its developers or promoters. Innovations such as the new FRP boats, motorization of traditional plank-built navas and construction of indigenous insulated iceboxes were carried out in the boatyards of Pentakota and Konark.

New technologies have considerably eased operations, and many fishers claimed that they could never return to dependence on manual labour for propulsion. The ease with which they could travel into the sea and back in a motorized boat was likened by many fishers to moving, in one step, from a bullock cart to a motor car. While technology has reduced drudgery, it has also rendered large sectors of the work force redundant. Similarly, while it has enhanced earnings – at least to the extent that fishers could maintain a more or less stable income in the face of decreasing fish catches – it has also made fishing itself more risky. Within the household, while improved technologies have increased economic returns to the family, it has undermined the role that women previously played in marketing the catch and managing the household.

New technologies such as ice and better transport have helped fish producers obtain higher returns for their catch. Prices of fish rose as icing became more prevalent, and most fishers reported that their earnings in real terms had risen. New categories of intermediaries found places for themselves in the rapidly evolving market chains. However, while technology has had a beneficial impact on certain sectors of the fishing communities, it has also had negative consequences for those who had no access to it. Some of these impacts are discussed below.

The diffusion of new technologies into fishing communities benefited a few people, while the large majority joined the growing class of daily wage earners. Numbers of ancillary workers may have increased as a result of this stratification, further increasing the competition at landing centres. Analysing the patterns of income distribution between mechanized and non-mechanized sectors in the capture fisheries of Orissa, Datta *et al.* (1988: A 187), cited by Thomson (1989: 15), report that "the programme of mechanization had little effect on the income of fishers; moreover, it helped only the upper income strata and the fruits of mechanization have not percolated down to the lower strata of the fishing units".

Better roads and improved transport and communication systems connected fishing villages to the rest of the world – no small benefit during cyclones or floods – but they also brought insulated vehicles and trader-financiers, who raised the value of fish and reduced the access of many small-scale processors and even producers themselves. There has been a reduction in traditional processing activities, with enormous impact on the large numbers of people dependent on them. Together with the increasing demand for fresh fish, the increased access to ice has made it difficult to obtain varieties such as ribbonfish, which were traditionally dried. In Puri and Konark areas, it was observed that several fish processors were more interested in working as commission agents and resellers of fresh fish than in making dried fish.

With increased investment needs, fishing operations have become more erratic. Competition from other players in the coastal areas has made boat owners more averse to risk. The decrease in fishing boats coupled with the increased population in fishing villages has led to a drastic depression in wages and increased unemployment. While bigger boats tend to retain a particular set of fishers by paying advances, crews in the non-motorized sector have become more nomadic, moving from boat to boat in search of opportunities. Ultimately, few people have secure rights to viable and sustainable employment opportunities year round and a large majority compete for low-paying and uncertain jobs.

An important result of importing modern technologies into fishing has been the overcapitalization of fishing efforts. Whereas an artisanal fisher could consider whatever he caught from the sea as rightfully his, mechanized and motorized fishers did not own catches, because they first had to deduct the cost of fishing operations. This additional cost has proved the undoing of modern fishing operations. The increased cost of production was acceptable as long as the markets were willing to pay. As long as they paid, fishing 'entrepreneurs' borrowed heavily from traders and invested in new boats, technologies and services. It was not long before most of the enterprises became overcapitalized to the point of being unviable.

In the ultimate analysis, boat owners were in a far more critical position than crew members, as they could not easily or profitably sell their boat, diversify or repay their outstanding loans to traders. Credit has become linked to the production of export species, resulting in the decline of credit availability to traditional fish processing operations. Many large-scale operators have moved down to small-scale operations, while small-scale processors have simply moved out altogether.

Until the early 1980s, or even later in some areas, most artisanal fishing systems in Orissa depended on one or two types of locally produced, handmade cotton fishing gear. These were heavy, took time and effort to make and repair, were not very efficient in catching fish and were mostly non-selective. Beach seines and traditional trawl nets are outstanding examples of such traditional gear.

When synthetic fishing gear was introduced, it revolutionized fishing methods. These nets were available literally 'off-the-shelf', were light and practically invisible once inside the water and could be made very selective. Soon a wide range of synthetic fishing nets of different materials, twine, mesh size, length and width began to be used for a wide range of applications in both demersal and pelagic fishing operations. Synthetic gillnets and trammel nets (called 'disco nets' locally) soon came to replace most of the traditional nets, and in the remaining cases, traditional nets (such as beach seines) were rigged with synthetic material. The synthetic nets needed to be replaced frequently, but this was not an issue as long as the catch was good. Traditional nets also gave way frequently, but because they took a long time to weave, they were mended frequently – rather than replaced – and used for as long as possible.

The first casualty of the shift to synthetic, factory-made fishing gear was the traditional village net makers. Women and old, 'retired' fishers generally fulfilled this function, but with the arrival of synthetic nets, the art of net making itself became redundant in many villages. While a few could find work mending nets (which in turn would soon be taken over by fishers themselves, who were beginning to spend more time on shore than at sea), the large majority of traditional net makers had to find other means of subsistence.

As fish catches became erratic, beginning in the early 1990s, boats needed to carry a wide range of nets *at all times* to enable fishers to choose an appropriate net on the spur of the moment, to suit the conditions at the fishing ground. Carrying a range of fishing gear was not part of a strategy to utilize a wide range of fishery resources, but a necessary bid to make fishing operations at least viable and self-sustaining.

From the mid-1990s, when the catch declines began to impinge upon returns in a significant manner, necessitating a tightening of operations, fishers began using only those nets that ensured at least a minimum return on investment or that targeted more expensive commercial varieties such as shrimp or seer fish. Consequently, a sort of 'homogenization' began to set in, with gear such as trammel nets being used more extensively than other types. The result is reflected in the catch composition, some varieties being exploited more than others. Thus where some species may appear to be in decline, they may in fact be less abundant in catches simply because they are less targeted. Conversely, fish that show an increasing abundance in catches might be in danger of overexploitation. Catch numbers of low-value varieties, which previously constituted the bulk of landings, have declined, with the result that a number of secondary users of fish – traders, processors and consumers – have been marginalized.

Achari (1986), cited by Thomson (1989: 21), noted that although mechanized and motorized craft allowed larger catches than non-motorized boats, these were often obtained at the expense of the latter. Achari concluded that motorized fishing operations were unlikely to break even unless additional costs were covered by larger catches, which was quite unlikely in the context of the growing resource depletion. The imperative of motorized and mechanized fleets to increase catch brought them into competition with the artisanal sector, which they easily outfished (Box 3).

BOX 3
Conflict between trawlers and artisanal fishers

The most important problem facing the Nolia fishers of Ganjam district is the encroachment on their fishing grounds by trawlers from Andhra Pradesh. Beginning in the late 1980s, trawlers began to fish off the waters of Ganjam, encroaching upon what was until then the exclusive preserve of the traditional Nolia fishers. In spite of repeated protests by local fishers, they continued to fish in these waters, confident that the artisanal fishers would not be able to dislodge them. The trans-state nature of the problem and the Telugu origins of the Nolias kept the administration from intervening in the situation. Besides a serious decline in fish catches owing to overfishing by trawlers, fishers in Nolianuagaon continued to face reduced access to fishing grounds. In due course, this led to violent confrontations between the artisanal fishers and the mechanized boat crews, forcing the two state governments to intervene. However, there has been no improvement in the situation.

While the case of Ganjam district is a classic illustration of the extreme impacts of competition, field studies indicate that this phenomenon is common across the coastal areas of Orissa, differing only in degree of intensity from place to place.

Infrastructure development in the fisheries sector

An analysis of infrastructure in Orissa's fisheries sector reveals two distinct trends: one, its focus on export markets oriented exclusively towards shrimp; and two, the uneven growth of infrastructure in different parts of the coast. Although many jetties and landing centres for artisanal fishing have been established recently, it is shrimp that receives top priority in terms of allotment of infrastructure resources.

Infrastructure growth differs markedly between urban and rural areas, artisanal and mechanized sectors, traditional and export markets and traditional and modern processing systems. This unequal distribution of infrastructure has led fishers to land their catch in fewer, better connected landing centres such as Paradeep or Balaramgadi, while fish sellers in remote villages are subject to exploitative terms and prices. Unequal infrastructure development also indirectly leads fishing efforts to be directed at fewer species to meet international and domestic demand.

While improved practices in chilling, freezing and handling have caught on rapidly for export species, traditional fish processing remains as poor as ever, with very few efforts directed at improving drying practices. The links between market orientation and preferences, the upgrading of quality and the enhancement of the asset base of traditional processors has not received adequate attention. Though the Government set up drying platforms at some places and encouraged people to use hygienic processing practices, these efforts were clearly inadequate. Most traditional fish processing and marketing operations remain exactly the same as they have been for centuries.

Transportation and communication links

Geographical isolation. The physical isolation of many fishing communities has a direct bearing on their poverty and vulnerability and is a factor that cropped up repeatedly in fishers' analyses of their inability to adopt innovations and access development assistance. Geographic isolation affects *everyone* living in remote areas and puts them all in the 'poor and vulnerable' category.

The need to be located close to the sea often takes fishers away from contact with other communities. The fact that land close to the sea is often saline, inhospitable and agriculturally unproductive tends to rule out livelihood opportunities other than

the production and/or marketing of fish. The physical distance that separates fishing communities has contributed to the development of systems and processes unique to fishers. This has separated them further from mainstream societies (Tietze, 1985, Schömbucher, 1986). Thus relations of fishers with the larger society remain confined largely to economic activities. Although better communications and transport networks have been established in most areas, the cultural divide still persists, and it is intensified in Orissa by linguistic and ethnic differences that mark fishers off from others.

Most of the fishing villages are characterized by poor infrastructure, poor or no transport and communications systems, weak access to development facilities and extreme poverty. Doctors, teachers, health and extension workers are often unwilling to travel or work there on a regular basis. Fishers' social networks and their awareness of the larger world are extremely weak. They frequently fall victim to bogus financial institutions and tricksters of various kinds, and end up paying disproportionately large prices for even simple services. This process regularly costs them their assets.

The distance between fishing villages and the sea is sometimes considerable and can pose additional problems for fishers. Fishing gear cannot be left on the boats after returning to the shore, and fishers are forced to transport their engines, sails, poles and nets back to the villages for safe keeping. Fish processing activities are generally not allowed inside the villages and are therefore carried out near or on the dunes that lie between the villages and the sea. This can cause great hardship to women processors: distances between their homes and the processing sites make it difficult for them to juggle household tasks and processing activities. In summer, it becomes very difficult for them traverse the hot sands with bare feet. But the most serious problems arise during monsoon periods, when a sudden night storm could destroy the fish in the salting vats or drying on the bamboo mats. Women are forced to keep a constant vigil, frequently rushing to the processing areas in the middle of the night when it begins to rain.

Weak transport links. The problem of inaccessibility is compounded by poor and inadequate transport services. Even where roads exist, the dearth of ready or assured transport poses a serious problem. Orissa has a weak public transport system. As a result, people depend on private transport (buses, 'trekkers', jeeps, auto rickshaws, tricycles). Private services are marked by uncertainty and inefficiency, belying the common assumption that privatization improves efficiency. Moreover, the availability of private services is mostly confined to a few big and important places, causing people to walk long distances to reach the nearest transport service point. The vehicles go off the roads quite frequently, endangering fishers' lives. Another hazard of inadequate transport services is overcrowding. A trekker that is supposed to carry about 10 people carries not less than 20, many of whom hang out of the vehicle on all sides and are even precariously perched on the bonnet. Road accidents involving these vehicles are quite frequent, both on national highways and village roads.

Many villages in the lower reaches of rivers such as the Mahanadi and Debi (Balipantal), in the estuarine zones (Bhitar Kanika area) of Bhadrak district, in the Chilika Lake area (Kirisahi) and even those close to urban centres such as Chatrapur (Nolianuagaon) have poorly developed transport facilities. Poor transportation systems also mean that fish and shrimp, the main produce of any fishing village, cannot be easily and quickly transported to markets beyond the village. The perishability of the catch adds another dimension to the losses incurred as a result of poor transport infrastructure.

Physical assets related to quality of life

While the lack of access to and availability of productive assets makes fishers poor, their poverty is reflected in their quality of life – housing and sanitation, clean drinking water and access to services.

Ownership of homestead land and housing. In southern-zone villages, ownership of homestead land is rarely legalized, though generally secure because of the closed structure of the communities and the absence of immediate plans for development. It is possible that, because of their dependence on an open-access (or common property) resource such as fish, fishers did not appreciate the importance of having secure ownership of the land on which they lived. The migratory nature of their activities may also explain why land rights were not uppermost among their concerns. However, the lack of homestead land rights means that fishers cannot obtain government assistance for housing construction. While there have been some efforts towards formalization of ownership, the majority of fishers do not know or are unable to negotiate the bureaucratic maze involved in legalizing their land ownership.

In the northern zone, where fishers have an agrarian background, the importance of land ownership is widely recognized. Consequently, most people have secure ownership of their homestead land, which not only helps them obtain government support for housing, but also constitutes a form of security.

In the villages abutting mangroves and other fragile ecosystems, such as Tikayat Nagar, ownership of homestead land is a thorny issue, because the land on which the village stands is classified as a forest in government records. Forests are generally not allowed to be privatized. In some instances, land previously recognized as private or as revenue property is reclassified as forest or protected land for conservation purposes. As a result, many people find themselves without land rights. It is only the inaccessibility of villages such as Khairnasi and Tikayat Nagar that protects fishers from being evicted, although they are frequently harassed by forest guards and other functionaries.

The quality of housing is one sure way to determine the poverty level of a family, although the housing assistance that the fishing communities have been receiving from the Government and NGOs makes it necessary to combine this indicator with others before judging the economic status of a household.

Poor housing has long been recognized as a serious problem of the fishing communities in Orissa. The Government has been actively encouraging the construction of permanent houses. The scheme entitled Indira Awaas Yojana was introduced in 1985/86 to provide better housing to the weaker sectors, with an accompanying thrust on employment generation. It has been the biggest and most widely known housing programme in the country and, in many fishing villages, there are at least a few houses built under the programme. However, a substantial proportion of the people still lack a secure roof over their heads. In many villages in which the Government has taken up house building under different programmes, it was seen that schemes were rarely fully implemented, with the result that nearly half the population was found sharing a house with another family or living in makeshift structures or in thatched huts. Following the cyclone of 1999, many international and national agencies also actively supported housing programmes for fishers.

The location of a house in the village is one indicator of poverty or affluence. For instance, a house constructed in a low-lying area often belongs to a poor household, as opposed to one constructed in an elevated location. But this varies from place to place. In some Ganjam villages, a house located close to the beach, where fishers conduct most of their fishing operations, is considered a sign of wealth, whereas in Chandrabhaga, which suffers from a problem of coastal erosion, residing close to the coast is a feature of vulnerability (Box 4). Being located close to the main road, with ready access to transport systems, is considered more important (the fact that such a house becomes invariably the first to play host to visiting government officers adds to its charm).

The size of the house is another important indicator of poverty. Many families live on the verandas of others' houses. Some that managed to obtain government support (linked to a contribution by beneficiaries for part of the costs) live in unfinished

BOX 4
Location and vulnerability

In Pentakota, it is possible to estimate the affluence or otherwise of different households based upon their distance from the beach – the more affluent a person is, the farther removed he is from the sea. It is possible to see a definite gradation in the quality of houses from one end to the other, beginning with makeshift huts (made of sail cloth) close to the beach, leading gradually on to thatched one-roomed structures, thatched but bigger houses, houses with asbestos roofing, single-storied houses with a reinforced-cement-concrete roof, and ending with double and multiple storied houses to the western end of the settlement, which is on the main road leading to Puri town. Typically, the poorest in the village – single-woman-headed households, old and destitute people and crew members without assets – inhabit the houses close to the beach, while the boat- and other asset-owning, politically and socially powerful sectors of the village live farther away. This is a pattern that is reflected in other locations as well.

houses, because they are unable to pay their part of the construction costs. Most houses of the poor have only one room. Many houses do not have a separate arrangement for cooking and sleeping. In most cases, cooking is carried out in the open or under an awning during monsoon periods. Similarly, the kinds of amenities that a household has, such as furniture (beds, chairs, cooking hearths), radio or television, a scooter, electricity, private latrines (or at least access to good public latrines), have a bearing on its social and economic status.

The kind of firewood used varies from household to household and is an important indicator of poverty. Materials used as firewood are: mangrove wood (often foraged illegally from neighbouring mangrove forests) in villages such as Tikayat Nagar; casuarina twigs (collected with or without the permission of owners of the casuarina groves) in Nolianuagaon; and cow dung cakes in Khairnasi. The economic status of families using these different items of firewood follows a hierarchy, with the poorest using illegally secured firewood and the more affluent having access to gas. Kerosene is available at a subsidized price at Public Distribution System (PDS) shops in most villages, but its use is largely confined these days to lighting lamps at home and at sea.

The condition of rural sanitation in coastal Orissa remains abysmal. NIRD (1999c: 82) notes, "The narrow understanding of the term 'sanitation' by the providers restricts the subject to the problem of removing excreta from the immediate environment and mere construction of latrines." The Centrally Sponsored Rural Sanitation Programme (CRSP) was launched with the specific target of constructing toilets, but the total sanitation coverage remains very poor. Consequently, the unhygienic and unsanitary conditions that prevail in most fishing villages remain a cause for concern. Sewage often flows through the middle of villages and the congested nature of settlements does not allow much space for disposal of garbage except in the middle of the village. Fish wastes are thrown on the beaches, putrid fish and spoilt brine are thrown everywhere in the fish processing areas, and dogs, pigs and goats have a field day amid all this. Fishers often use the fish landing centres and other village commons as public latrines. All this allows much scope for ill health to proliferate … and it does.

Drinking water. Drinking water is a common problem in most coastal villages, and the terms of its access are often very tough for the poor. Water is usually obtained from open wells situated close to the village dump, the fish processing areas or the open areas that community members use as public latrines. The National Drinking Water Mission

(NDWM), which was later renamed Rajiv Gandhi National Drinking Water Mission (RGNDWM), introduced a number of innovative technologies but, as NIRD (1999a) points out, there are concerns over the long-term sustainability of these 'technical quick-fixes' given the absence of public participation, the relapse of villages into the 'not covered' category because of poor water resources management, inadequate attention to operations and maintenance, undue emphasis on creating new assets and a general lack of cost and efficiency concerns in the sector.

A number of poverty indicators were suggested by fishers in relation to drinking water, based upon issues such as:

- source (from protected tap water to unprotected and often contaminated open sources, such as rivers);
- availability (from perennial to infrequent);
- quantity (from abundant availability to barely adequate or inadequate for daily needs);
- quality (from good to very poor – the latter is reflected in the widespread prevalence of waterborne diseases);
- purpose (solely for drinking purposes, only occasionally for bathing and washing purposes);
- access (from free and privileged to restricted or prioritized according to caste, gender or place of residence).

Cyclone shelters. In the post-1999 cyclone period, many cyclone shelters were constructed or are under construction in several coastal villages. However, in some cases at least, the ownership, management, maintenance and possible alternative uses to which a shelter can be put at normal times do not seem to have received adequate attention from either the agencies concerned or the communities. In the long term, their usefulness might be doubtful. While there has been an emphasis – on paper – on ensuring community ownership of the shelters, it remains uncertain to what extent – and how – this has actually worked.

Availability of and access to human assets

Population

The population of fishing communities in Orissa has kept pace with the rapid growth rate of the national population. The last comprehensive survey of the marine fisher population in the state was conducted by CMFRI in 1980. A comparison of this survey's numbers of active fishers with current numbers shows that they have grown rapidly, from about 30 000 in 1980 (CMFRI, 1987: 9; BOBP, 1984b: 6) to nearly 90 000 in 2000 (DOF, 2002: v). However, without more concrete evidence, it cannot be said with certainty that the increased population has meant increased fishing effort, because the *access* to means of fishing has become increasingly restricted in the last decade. Overall, there has been a reduction in the number of boats through the 1990s, as Table 12 shows.

TABLE 12
Number of marine fishing craft in Orissa (1992/93 – 2000/01)

	1992/93	1996/97	2000/01
Wooden trawlers	458	686	661
Sona trawlers			288
Gill-netters	633	590	687
Motorized country craft	1 758	2 640	3 643
Beach landing craft	84	135	85
FRP catamaran	45	810	(BLC + FRP)
Traditional craft	12 810	8 353	7 047
Total	15 788	13 214	12 411

Source: DOF, various.

Indeed, there has been a decline in both the total number of fishing craft and traditional craft. The increase in numbers has concerned mechanized boats, which are generally not owned by poorer fishers. In any case, the available evidence does not show that the decline in the number of livelihoods in the traditional sector has been compensated by a corresponding rise in the demand for fishing crew in the mechanized sector.

Thus, while it is possible to see that increased population has meant spreading the catch more thinly across a larger number of people (reducing *access* to fish), it is not clear whether this has led to an actual decline in the *availability* of fish. The competition for fish at the landing centres has certainly increased, not only among fish processors and traders from within the village, but also from outsiders. The result is that fish costs have gone up substantially and less fish is available per processor or trader than previously. Conflicts between different players may also have increased.

At the community level, increased population has meant reduced per capita availability of living space and increased congestion. As houses began to be squeezed together, many problems cropped up, affecting land and house ownership, hygiene and cleanliness, disposal of solid and liquid waste material, cooking and processing arrangements, household safety and security, and cultivation of backyard vegetables.

Relevance of traditional skills, knowledge and capacity for manual work

Many authors that have discussed the traditional knowledge systems of coastal fishers in Orissa – including Tietze (1985) and Schömbucher (1986) – indicate that fishers in different ecosystems – marine, lacustrine, riverine – have a remarkable understanding of the dynamics of the ecosystem, developed over centuries. They make a particularly strong case for the strength and vibrancy of the indigenous systems in Orissa as compared with elsewhere. The non-local origin of fishers (particularly in the southern zone), the lack of previous experience of marine fishing in the state (which means developing suitable, location-specific fishing systems) and limited markets for marine fish in local areas required a strong and centralized system of organization within fishing communities.

The radical shift in priorities from subsistence-based activities to commercial enterprises and the attendant change in exploitation patterns through technological innovations in fishing and post-harvest methods have rendered fishers' traditional skills, knowledge and ability to invest in manual labour more or less redundant. Versatility, which was regarded as the ability to be a master of the sea, has now come to mean the ability to survive by any means.

Kalavathi and Tietze in Tietze (1985: 86) indicate that outsiders traditionally took over fishing activities more easily in the northern zone than in the southern one, where fishing in open waters required a specific kind of knowledge and expertise that only the Vadabalijas and Jalaris (the traditional fishing castes) possessed. The indigenous knowledge systems of marine fishers of the southern zone, in particular, are considered to be of high quality (Tietze, 1985: 42, 58). Here many communities have well-developed institutions for the administration, management and allocation of resources. There has been an increasing influx of outsiders into fishing activities in the southern zone, mainly at the asset-owning level, and traditional fishers are increasingly relegated to being crew members.

Women's knowledge and understanding of product flows and consumer preferences in the markets were as perfect and as precise as any marketing company's. However, the shift from processed fish trade to fresh fish trade and the increased influx of processed fish from all corners of the country to large markets such as Humma led to a depression of prices and a loss to the processors. One can infer from this that the women's ability to forecast market trends worked only so long as the markets remained local. Most women fish processors interviewed during the study indicated that they lose money in one out of every three or four transactions (Esser *et al.*, 2003).

BOX 5
The migrant experience in Pentakota

A largely illiterate minority group that finds itself in the midst of an alien environment, culture and language tends to hold together in its common urge to survive and make good despite overwhelming odds. The general run-of-the-mill problems that are endemic to coastal fishing villages lose their relevance, albeit momentarily, although awareness of such issues could become sharper in the light of the clarity of thought – and freedom from orthodoxies – that migration bestows on people. Cut off from their 'mother' communities, the migrants have a tenuous feeling of belonging. This is reflected in the constant wishful refrain among older fishers about going 'back' to Andhra Pradesh. The gulf that separates them from their home village becomes apparent whenever they visit their village, and they become anxious to return to their new abode. It is as though they are scared of being sucked back into the quagmire of poverty, tradition and relationships that they had escaped by migrating to Puri.

In their adopted village, their relations with the local majority community are marked by ambivalence. On the one hand, there is a sharp sense of distance, even distrust, between the two, and fishers constantly strive to assert their cultural superiority and autonomy. On the other hand, they simultaneously strive to integrate themselves more fully into the majority community.

This feeling of 'belonging without belonging' at either place is what marks the life of a first-generation migrant. There is a constant reappraisal of their status and values – at least among the pioneers – which leads to some striking adaptations, changes in attitudes, values and perceptions. Most importantly, the group attempts to, and largely succeeds in, becoming self-sufficient. New skills are learned, needs are kept minimal, division of opportunities becomes ingrained, and drawing upon one another's assets and abilities within the community is accepted and encouraged.

Thus migration represents both a liberation and a burden. The more removed a new community is from its forebears and the more isolated and unwanted it feels, the more freedom it has for making new beginnings and learning from past mistakes. It is possible to see that the people in new Pentakota are freer and more adventurous and enterprising than those in the old village bearing the same name in Andhra Pradesh. The other striking thing is the widespread social networks that characterize life in new Pentakota, which is possibly the result of a more equitable distribution of opportunities, access and resources.

As time passes, and the community becomes more established and stabilized, people tend to lose interest in 'sticking together'. Social networks begin to weaken as the pioneers give way to elites, who relate themselves to the elite of the majority community rather than to their own people. Individual economic interests take the upper hand and freedom to explore becomes freedom to exploit. Exploitation of the outsider was a necessity at one time, but it becomes an opportunity not necessarily confined to outsiders. Versatility leads to adventurism and recklessness. Conversely, the spirit of exploration and enterprise gives way to a spirit of caution and risk. Deviation comes to be frowned upon. Political, spiritual, economic and social hierarchies take root and deepen. 'Belonging-without-belonging' gives way to being 'neither-here-nor-there'. And this transformation, too, is taking place in Pentakota.

Migration

Migration constitutes an important livelihood asset for fishers. There is a distinction between long- and short-term migrants, and their adaptations to the migratory existence vary considerably. This in turn shapes their lives differently (Salagrama, 2002: 28).

Migration is implicit in the marine fishing sector, and the fishing communities have adapted their life to it quite remarkably.

Long-term (permanent) migration. Marine fishing in Orissa is unique in that it is mostly conducted by settlers from other areas: Andhra Pradesh, West Bengal and Bangladesh. Permanent migration from these areas into marine fisheries has been occurring since the 1950s. The permanent settlers have developed good systems of organization and management, and are accepted as locals by everyone. Considering their linguistic and cultural difficulties, coupled with illiteracy, it is amazing to find that migrants not only secured and consolidated a place alongside the host community, but also dominated the local economy in some places. Several migrants continue to have relations with people in their native lands, but consider themselves full-fledged Orissa residents.

The thriving fishing village of Pentakota in the heart of Puri town stands testimony to the assimilative capacity of fishers (Box 5). On the other hand, the continued marginalization and vulnerability of some of the Bangladeshi settler communities in the northern zone reflects the other face of the 'migrant experience'.

Seasonal (short-term) migration. To quote Schömbucher (1986), "Spatial mobility in maritime societies is made possible by environmental conditions, i.e. access to the sea is guaranteed in [the other locations where they migrate] as well." The fugitive nature of the fish they hunt impresses itself upon fishers, too, as do the open-access systems of capturing them. In many places, fishers developed systems that were particularly adapted to a quasi-nomadic existence.

Traditional migrations could involve short- or long-distance movements. Within Orissa, many fishers from Chilika Lake seasonally migrate to the sea beach (often a sand bar separating the lake from the Bay of Bengal) where they erect small makeshift tents and pursue fishing for four months a year. The Oriya fishers, who reside about 20 km upstream from the mouth of the River Debi between Puri and Jagatsinghpur districts, seasonally migrate downward, i.e. closer to the sea, and reside on the beaches, using them for the purpose of fish drying as well. Similar movements have been reported from the Bhitar Kanika villages, where fishers move from creek fishing to marine fishing seasonally.

Bavinck (2001) suggests that in open sea fishing systems, "fishing spaces are open to the entire population of artisanal fishers (which largely, although not entirely, coincides with caste). Not only do all artisanal fishers benefit from reciprocal access, but they also benefit equally. The similarity of fishing technologies in the artisanal sector provides each participant with a more or less identical point of departure. Reciprocity and equality remain important clauses in the artisanal fishers' rules of open access."

This explains why traditional migrations did not affect the social fabric of the host community and why seasonal migration provided fishers an opportunity to improve their condition. For the migrants, the seasonal movement had a rhythm of its own, and this can be seen from the accommodations and adaptations that communities have made in socio-economic as well as fishing terms. Obviously, both host and guest communities were prepared. Various systems in the fishing sector – such as trading, credit and management – indicate that accommodation was made for migration.

Long-distance migrations into Orissa involve Andhra Pradesh fishers travelling seasonally to Puri and Paradeep. Barring the fact that fishers operated from a foreign place rather than from their own fishing village, the migration changed very little in their conditions of work – they used the same boat, operated the same gear and caught more or less the same fish. The cultural milieu into which they migrated largely coincided with their own. Many wives, particularly of boat owners, followed their husbands to the new areas and took care of cooking and fish marketing. So for all practical purposes, it was merely a change of scenery for fishers.

TABLE 13
Coping strategies adopted by fishers

	Improving current systems	Diversifying into alternatives within the sector and locally	Diversifying into alternatives locally, but outside the sector	Changing to new areas for work within the sector	Changing to new areas for new work outside the sector
Fishers	Fishing in the sea with motorized boats	Fishing in the sea, followed by creek/ river fishing	Fishing, alongside work in cashew-nut plantations	Migration to Andra Pradesh to work in reservoirs	Migration to urban areas as manual labourers
Fish processing women	Fish processing and trade	Dry fish processing, supplemented by fresh fish trade	Fish trade, complemented by agricultural work	Wage labour in landing centres	Migration to urban areas as manual labourers

Ability to diversify from traditional occupations

The poor in most cases seem to have made remarkable adaptations to their changing conditions. Thus a study such as this must attempt to understand the ways in which the poor make decisions about their lives and livelihoods. Their choices in terms of livelihood alternatives are not random, but result from largely unconscious processes of weighing options and careful selection. An analysis of such choices shows the interrelated nature of their selection in the context of the larger processes that determine their lives (i.e. their livelihood framework). The relative importance of a particular livelihood activity to a household at any point in time is thus a combination of the quality of the opportunities available, the terms of their access, the level of dependence on that resource *at that time* and, most importantly, their ability to take advantage of the opportunities.

An analysis of the new livelihood strategies adopted by fishers indicates that they are of three kinds:

- those addressing factors that cause changes in a given condition – for instance, fishers diversifying their fishing gear or area of operation to reduce pressure on inshore or specific fish species;
- those addressing the condition itself – fishers moving out of fishing to agriculture; sending their children to school; and
- those addressing the consequences of the condition – fishers depending on non-fish food items, cheaper fish or fish brought from elsewhere for their consumption needs.

At another level, the coping strategies adopted by fishers to enhance their livelihood systems fall broadly into three categories: (i) strategies for enhancing their current livelihood systems; (ii) diversification into other occupations (whether at the individual level seasonally, or at the household level, where different members work in different activities); and (iii) a complete shift to a new activity. Within these three categories, many gradations could be discerned in the fishing communities of Orissa (Table 13).

It is true that adaptive strategies are frequently not as efficient as the traditional livelihood strategies. Some of them are unhealthy or outright illegal and there is a perceptible downward slide from the status quo. Yet it is possible to show that the choices that the poor have made are often the best that could have been made in a similar context by *anyone*. Moreover, the effectiveness of the choices varies among individuals, groups, places and times, owing to the multitude of factors that play into these decisions. This resourcefulness of the poor in adapting to changing conditions, if properly harnessed, can lead to meaningful interventions.

Food and nutritional security

Analysis of this subject has led to strong insights about hunger and deprivation in the fishing sector. Food and nutritional security is a subject that has been inadequately documented, particularly at the household level, where differential access to food keeps the more vulnerable people (women, particularly pregnant and lactating mothers, young girls and old people) at risk.

Food insecurity in coastal fishing communities: availability versus access. Coastal areas are considered more affluent than the upland areas in Orissa, particularly in terms of food security. This is one reason why most international and national relief and development efforts are concentrated in interior areas. The difference between inland and coastal areas is that in the former, food insecurity may be linked to *non-availability* of food, while poor people in the coastal areas – especially marginalized communities such as fishers – suffer from a *lack of access* to food. In other words, the food is unaffordable even if produced by fishers themselves. When the issue is understood from this perspective, it becomes clear that food security and livelihood security go hand in hand.

There is a marked difference in terms of food insecurity between some parts of the northern zone (particularly in Balasore district) and the rest of the coastal areas. Northern-zone fishing communities, being agrarian in origin, tend to own small patches of agricultural land, which provide sufficient grain for their subsistence during lean periods. Besides, most northern-zone villages are marked by fertile black-cotton soil, and backyard plots are widely prevalent, supplying vegetables for household needs. Many households maintain poultry and livestock, thereby supplementing their income and diets with milk, meat and eggs.

However, this study also revealed many differences in access to and availability of food among different stakeholder groups in the northern zone. A sizeable number of people do not own agricultural or even homestead land. Needless to say, these landless fishers fall into the same category as those in the southern zone in terms of food security. There are a number of destitute people in these villages, who depend on the charity of others to meet their subsistence needs. Religious and cultural conventions that require women to fast frequently and for extended periods of time can mask their vulnerability behind a general picture of affluence. In the southern and central zones, people may go without food during lean periods. In the northern zone, however, food insecurity means people resort to cheap or not-so-healthy foodstuffs for parts of the year.

Another important finding concerning the northern zone is that its apparently food-secure fishers seem to be candidates for the category of 'tomorrow's poor', irrespective of their current status. While they are more food secure compared to their southern-zone counterparts, this is changing for the worse as they find their current livelihoods coming under threat. People may have sufficient means to overcome this problem in the short term by using their savings and diversifying their activities to a limited extent. However, whether or not they can continue to cope for long in the absence of suitable long-term alternatives is an issue of concern to fishers themselves.

Decreasing access to fish for domestic consumption. Fish is invariably one of the most important food items consumed by fishers. However, a key finding that emerged during the study is that fishers cannot afford to eat the fish they catch. It is true that the general decline in fish catches has reduced the availability of fish for fishers' own consumption, but the phenomenal increase in prices of all varieties of fish through the 1990s has been the more important reason. The increase in fish prices is considered to be higher and more rapid than for any other food source (Government of India, 1997). For fishers, selling their catch and consuming other sources of protein in their diet has been an economically sound option. The fish species that were traditionally consumed have become so expensive that fishers consume cheaper varieties, which they *purchase* from the markets! Many villagers reported consuming fish less frequently than in the past. For a large number of households – particularly those headed by fishing crew members, or single women, old and physically challenged people, who collected a few fish from fishers for consumption purposes – this has meant a serious loss.

Consumption of vegetables, lentils and potatoes may have increased in proportion to the decrease in fish consumption. Not surprisingly, several respondents in the very

poor category reported that the cost of vegetables has also grown rapidly over the last few years.

Nutritional security. The prevalence of diseases related to hunger and malnutrition is fairly high in fishing villages and assumes serious proportions during the 'hunger' months. Many children suffer from stunted growth and wasting. Children with pot bellies, dry skin, split lips, body sores and knock knees are a frequent sight in all villages. Intrahousehold differences exist in terms of access to food, particularly in large families. In general, women eat last in the family, often making do with leftovers, which may not always be sufficient to sate their hunger. This deprivation may take the form of differences in variety (e.g. less protein foods left over), quality (inedible or tasteless portions of food left over), or quantity and frequency of food intake. Pregnant and lactating women are reported to receive better treatment only in a few villages. However, also men often go without food in order to ensure sustenance for children or weaker members of the family. It is reported that boys receive preference over girls at mealtime, because boys begin fishing from an early age and contribute to the family pot, while the many chores that the girls perform are not monetized and are hence unrecognized as such.

Seasonality and food insecurity. Food insecurity in fishing communities is mostly linked to seasonality, although of late it has become increasingly prevalent over the entire year. The monsoon months are considered to be the worst period, when food insecurity and vulnerability are at their highest. Most fishers call these three months, which vary between June and November at different locations, the hunger months. It is considered shameful and demeaning for a family to announce its inability to secure food for the day. Consequently, the fact that almost 90 percent of the families in every fishing village go without food for a few days in a year remains unexpressed. Even if it were to be voiced, it would be futile, because, according to many women, entire villages suffer during this period and no one would be in a position to come to the rescue of another. NGO records indicate that fishers take out most of their loans during lean periods and spend them entirely on consumption.

For many stakeholders who are not producers themselves, but whose dependence on fish is equally important, such as fish processors, carriers, transporters, sellers, boat mechanics and a host of other workers, lean seasons are real nightmares. Some of these categories are represented by women, some of whom may be single. Given their poor investment capacity and skills for diversification, lean periods bring them unimaginable hardship.

Shocks and food insecurity. Food insecurity becomes a manifestation of lack of availability of food at times of natural disasters such as cyclones, which are among the worst periods for deprivation and hunger. Many villagers still have vivid memories of the harrowing time when two cyclones struck Orissa within 15 days of one another in 1999, effectively destroying the entire coast. It took days before assistance reached some of these villages, and all survivors starved during the period. As with seasonality, the impacts of shocks such as cyclones generally strike everyone in a village irrespective of their social and economic position, although their coping mechanisms might differ.

Quality of food insecurity. Food insecurity does not always mean going without food the whole day. More often, it means going without *sufficient* food in a day. Generally, fishers prefer to eat three meals a day and one indicator of food insecurity from the community perspective was a reduction in the number of meals in a day. Alternatively, as the women pointed out, food insecurity may mean taking three meals a day but of substandard quality or inadequate quantity. Under this definition of food insecurity, the problem attains serious proportions, with a large percentage of villagers reporting to be food insecure at one time or another during the year.

There is a clear correlation between a family's number of working person-days (and, more importantly, daily *earnings*) and its food security. Fluctuations in daily earnings are reflected in the quality, quantity, variety and frequency of food consumption. The consumption of various foodstuffs from day to day shows a lopsided pattern, which is determined by the earnings of family members at different times.

Cost of food as a percentage of income. In terms of percentage of income spent on food, estimates varied between different poor groups in a village and also within the same economic group in different villages. In general, a large proportion of a poor household's income – ranging from 40 and 60 percent – goes into meeting their food needs. A family's income does not come only in the form of cash. Calculations must take into consideration non-monetary returns such as production of foodstuffs. In the northern zone, for instance, women's household-based activities contribute almost equally to their men's earnings in meeting the family's food requirements.

An important feature of most of poor fishing households is that they obtain their food requirements on a daily basis except when buying from the PDS. The latter necessitates purchasing on a monthly basis or whenever rations arrive. Daily purchase of essential items costs more than bulk purchase, but the limited surplus with which fishers operate does not allow them to buy in bulk. This becomes a serious problem when a cyclone strikes or when family earnings drop as a result of poor fish catches during the lean months.

Fishers' access to government programmes to enhance food security. A number of fisher families depend on the PDS not only for buying their foodstuffs, but also for other essential ingredients such as kerosene. A major limitation of the PDS is that it meets only 20 percent of the cereal requirement of a family and does not include most of the other basic grains that people are used to consuming. There are reports of widespread misuse of ration cards, leakage of foodgrains from ration shops, poor quality of the foodgrains supplied and irregular availability of rations.

Under the Targeted PDS, which replaced the PDS in the late 1990s, the number of households that can obtain support is fixed at the state level, with the result that only a specific number of households are being covered in each village. Consequently, many poor households in dire need of PDS support are excluded. The identification of a few needy households within a community characterized by uniform levels of deprivation and vulnerability is a difficult task and, for the most part, subjective. As a result, many 'invisible' poor households are left out completely. Chaturvedi (2002: 109–112) analyses the performance of PDS and concludes that without adequate purchasing power in the hands of the people, access to food security cannot be guaranteed, even if it is made available through the PDS at subsidized prices.

Whatever its shortcomings, the PDS does appear to facilitate food security at least in some areas and households in the coastal fishing communities of Orissa. However, the structural adjustment programmes (SAPs) adopted by the Government of India in the 1990s are beginning to have an impact on the PDS, which is being 'rationalized', if not gradually phased out. Many fishers report that availability through the PDS of foodgrains and other essential ingredients has decreased or that the gap in prices between the open market and the PDS has narrowed so much that the cost benefits are minimal.

An important scheme of the Government and some NGOs in the aftermath of the 1999 cyclone was the food-for-work programme. Fishers and other affected communities in coastal areas were paid in rice for restoring damaged roads and other infrastructure. Fishers in some villages have benefited from the programme. But because it is spread unevenly, not all fishers could take advantage of it. It has also been reported that fishers in some villages refrained from joining the programme because of their traditional reluctance to engage in non-fishing work.

Health

A key characteristic of fishing communities in Orissa is the widespread prevalence of disease. Fishers attribute their poor health to the unsafe, unhealthy and unhygienic working and living environment at sea, the landing and processing centres and their homes, as well as to poor access to health care facilities and basic necessities such as clean drinking water.

A UAA project document states, "Poor environmental sanitation and lack of protected water supply are the main causes of the prevalence of waterborne diseases such as gastro-intestinal disorders, jaundice, malaria and typhoid. Most conspicuous within the target community [i.e. fishing communities of Ganjam and Puri districts] is the large proportion of malnourished under-five children associated with worm infestation. Acute respiratory infection, measles, polio and diarrhoeal diseases are common, resulting in a high infant mortality." (UAA, 1992: 17)

AIDS continues to be a sensitive and hence largely unspoken issue, with the result that information is difficult to obtain on the magnitude of the problem. There are reports from NGOs and governmental health agencies that indicate a widespread prevalence of AIDS in the coastal fishing communities. Pencode, an NGO working on AIDS issues in Pentakota, reports that nearly 30 percent of the women in the village have tested positive for AIDS.

Early marriages. Early marriages and large families are common in the southern fishing villages. Girls are married at 10–12 years of age, while the going age for a bride in the northern zone is 15–16 years. By the time she is 20, the girl has become the mother of two or three children. Dependence on local midwives, who use crude methods to extract the baby and stop the bleeding, affects both child and mother, sometimes fatally. Factors such as poor nutrition, the need to work almost immediately after giving birth and caretaking of other children take a toll on the mother, accelerating her aging process. Many women who are barely into their thirties appear middle-aged. Children's health is the most important indicator of the malnutrition endemic in fishing communities. Many children are sickly and grow up to be perpetually ill or disabled because their mothers are often unable to tend to their needs. Most children are malnourished, poorly looked after and rarely receive medical examinations. Where daily existence is itself a struggle, long-term health impacts are not given much attention. However, things may be improving through government and NGO efforts to train traditional birth attendants in hygienic and proper ways to facilitate childbirth and the post-partum period.

Men and ill health. Many men appear to suffer from ill health as well, although their condition is not as bad as that of women. Most fishers complained of frequent bouts of illness, which laid them low for days at a time. Hard work, coupled with irregular and inadequate food intake, appears to be the leading cause of malnutrition.

While occasional bouts of illnesses, such as diarrhoea, can be temporarily disabling, many fishers also suffer from long-term illnesses. Long-term illnesses are often said to lead to the bankruptcy of whole families. In all villages in which field research has been conducted, there were at least a few examples of these kinds of problems.

Entire families suffer when men in the productive age group face chronic illnesses. Not only does the fisher physically suffer and forego earning, but he also exhausts the family savings and even goes into debt to buy medicines and treatment. It is not uncommon that illnesses lasting less than a month set in motion a chain of events that ultimately lead to the family selling off its productive assets or houses, or putting off their daughter's wedding for years.

Alcoholism. While southern fishing communities have a tradition of drinking (see, for instance, Rice, 1901), it has been suggested that drinking by the Bengali and the Oriya

fishing communities is of a more recent origin and there are reports of increasing consumption of liquor by these communities. Almost all seagoing males in the south tend to drink, which they insist is essential to ward off the effects of hard and often bloody and stinking work at sea, as well as the loneliness this kind of work induces. Young men have opportunities to drink from an early age. Many women identify liquor as the cause of the early deaths of fishers, explaining at least partly the prevalence of widows in fishing communities. Although no statistics are available, it is easy to see that the number of widows in these fishing villages is disproportionately large.

The Government issues licenses for the sale of fermented molasses in the villages, and licensed shops exist in all villages for its sale. But illegal breweries also thrive near fishing villages, using rice water and *mahua* flowers to brew more potent spirits. A third source of alcohol is the rather interestingly named 'Indian-made foreign liquor' such as brandy, whiskey and rum, whose consumption is increasing in fishing villages. This phenomenon also adds considerably to expenses.

Alcoholism among men has serious consequences for the food security of the family. Earlier, when women dealt with trading and house management, they gave a part of the earnings to men for drinks, keeping the rest for household maintenance. But with the change in economic relations within the family, men drink as much as they can with their earnings and give only the remainder for household use. With decreasing returns from fishing, it has been reported that the drinking among fishers – on the pretext of frustration – has increased considerably. The country liquor they drink is often very potent, or adulterated, to the point that the drinkers rapidly weaken and then die.

Another feature that goes hand in hand with drunkenness is wife beating: many women complained that their husbands beat them whenever they drank. Drunkards also frequently enter into fights with other villagers, and these scuffles often cost money, a limb or two, or even lives.

Access to health care. The fishing communities traditionally depended on local health care practitioners, mostly indigenous doctors and witch doctors. In 1992, for instance, more than 95 percent of deliveries in the fishing communities were reported to have taken place at home, assisted by local midwives and leading to a high incidence of maternal mortality and neo-natal tetanus (UAA 1992: 17).

The period of the 1970s and 1980s saw a spurt in support for rural community health programmes, and formal health care facilities started becoming more accessible to the rural poor. In spite of this, public health services in coastal villages appear to be largely non-existent. Diarrhoea and respiratory infections, malnutrition and communicable diseases are widely prevalent in the coastal fishing villages. Fishers report that poor infrastructure, inadequate staffing, frequent absenteeism, callous services and poor support and management have made government health services ineffective.

For the poor, government health care facilities continue to be the only source of medical care at a relatively low cost – within the village, the region or in nearby towns. The introduction of SAPs in the 1990s, under the guidance of the World Bank and the International Monetary Fund, has exacted a heavy toll on poor people's access to health care, because they promote user financing and cost recovery in all sectors, including health. As NIRD (1999c) says, this "has disturbing long-term social and ethical implications".

The growth of private-sector health care in the 1990s was confined largely to urban areas, and it has been reported that many well-off families in the villages have begun to access these services. There have also been many NGO initiatives in various coastal areas to make quality health care accessible to the poor, but the situation needs much improvement on all fronts. In the northern zone, fishers prefer to have homoeopathic treatment because of their traditional reliance on it and its affordability. Many poor and destitute households make do with some household remedies for most problems. Still,

the amount spent on health care is second only to that spent on food in a majority of fishing families.

Literacy. Fishing communities have historically suffered from very low levels of literacy. However, it appears that the situation is changing for the better. Although literacy rates in the coastal villages of Orissa continue to be below those for their respective districts and below the national average, many people have begun taking an active interest in education and in sending their children to school. One reason given by fishers was that literacy opens doors for diversifying out of fisheries. Enhanced access to government schools, which provide incentives such as rice, midday meals, clothing or books, and to private 'convent' schools in some villages was another reason given by fishers for their increased interest in literacy.

During the 1980s, BOBP carried out the Non-Formal Primary Education (NFPE) project in the coastal districts of Orissa, targeting fishing communities. Under the project, a curriculum tailored to the needs and circumstances of the children in marine fishing villages was prepared and implemented. The project received widespread support from fishers, who provided rooms or houses for the centres and even food and accommodation for the teachers (BOBP, 1987b: 5). The pilot project established a number of NFPE centres in the state by the late 1980s. But it lost steam by the early 1990s and became redundant.

The efforts of several NGOs to establish non-formal schools in fishing villages are another important reason for the increased interest among fishers in education. In the villages where UAA ran schools for children through the 1990s, the local women's groups took over their management, and these women continue to run the schools with their own resources (ICM, 2002a).

An important investment in terms of linking food security to literacy is the programme to provide rice to schoolchildren. The children are provided a fixed quantity of rice on a monthly basis in return for regular attendance, and this has encouraged many fishers to send their children to school. Several NGOs – particularly church-based organizations – have been extending similar services, and doing even better than the Government, by providing midday meals to children in places such as Chandrabhaga and Pentakota. This programme seems to have made a significant difference in school attendance, while making rice accessible to fishers and others.

Availability of and access to social assets

Class formation in fishing communities

Understanding the process of class formation in fishing communities is important, as it has led to a reorganization of social relations at various levels. At the household level, women have become secondary participants in the economic activities related to fishing. This has undermined not only their status, but also the food security of the family as a whole.

At the community level, the new economic power centres have rendered traditional systems redundant or, worse, even more iniquitous than they already were. Although beset with problems, traditional systems at least ensured some semblance of equity and opportunity for all. Urban areas attracted the attention not only of policy-makers and development agencies, but also of the upper crust of the fishers, who began concentrating their operations in a few better-connected landing centres, dragging poorer stakeholders in their wake.

Traditionally, marine fishing was a communal activity with each member contributing to the effort in kind. Many authors have discussed the egalitarianism[4] that prevailed in

[4] Egalitarian, of course, in the broad economic sense of the word; there is no denying that there existed many social inequities in the traditional systems of organization in fishing communities, the impact of which must have been reflected in economic terms as well. However, it is also incontrovertible that

fishing communities in the southern zone (the literature on fishers of the northern zone is meagre in comparison). They contend that as long as every member of a maritime society had equal access to resources and played a general and specialized role in their extraction, egalitarian structures would predominate. The interdependence of the various trades and players in the community reinforced these structures – not only in fishing, but also in building up specialist services such as boatbuilding and net making.

Thus the social structure of the open-sea fishing communities dictated specific roles for diverse categories of players, including women, within an economic system that both provided for and required the participation of all sectors of the community in production and distribution. This balance prevented capital accumulation, which in turn discouraged class formation.

In northern-zone villages such as Balarampur, sharing was an essential ingredient of fishers' lives and livelihoods. Moreover, the shares given to owners of craft and gear were equal to those given to crew members. Boat owners' incomes, then, were not so much higher than crew members' as to warrant placing them in different classes. Schömbucher (1986) argues that even if owners did receive a higher share of the returns, these tended to be redistributed in the form of repairs and maintenance of the craft and advances paid to the crew.

The development efforts of the 1970s and 1980s gave rise to a hierarchy based on economic criteria in the villages. The appearance of mechanized boats in the early 1970s set in motion a process of change that accelerated through the 1980s and culminated in 1990s. The new boats split the craft-owning class into two: those who made the shift to trawling and those who remained behind as traditional craft owners. The success of trawlers attracted many outsiders into fishing. For the first time, people from non-fishing backgrounds entered the sector, often from the majority Oriya speaking communities, and largely as investors in fishing craft. Their influence, however, extended beyond mere shore-based management of operations.

Within the artisanal sector, diversification of fishing craft gathered momentum as a result of: (i) support from the Government; (ii) increased competition in near-shore waters; (iii) a need to move farther out to sea; (iv) scarcity of wood; and (v) availability of alternative boatbuilding materials such as FRP. Traditional fishing was a manual operation requiring hard work, and fishers widely welcomed the motorization programmes. This caused another split among the craft-owning classes – the motorized boat owners and the non-motorized or traditional boat owners. The latter were clearly fighting a losing battle.

The arrival of motorized craft concentrated ownership into fewer hands, relegating crew members to the status of employees, who contributed little more than their labour on the boats. The need for working capital was largely met with advances from traders. Schömbucher claims that as a result of the commercialization of fishing in Orissa, the Vadabalija fishers became dependent on outside merchants and moneylenders right from the outset of the process in the 1950s. This commercialization – largely attributable to the 'shrimp boom' in the 1960s and 1970s – also led to the upward mobility of some fishers and to the consolidation of income differences that could no longer be evened out. Later initiatives such as FRP boats, distant market trade and aquaculture continued these trends, moving the classes apart and strengthening the differences between them. Needless to say, the classes were not watertight compartments and there was great scope for both upward and downward mobility, but the factors contributing to upward mobility were clearly inaccessible to an increasing number of people.

The traditional wage-earning classes, who constituted the majority, did attract and benefit from development programmes, but by and large these efforts gave them just

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fishing communities had much more equitable systems of organization than many others, comparable only with that in tribal communities.

enough assistance to facilitate their coping with the changing times. They were not adequate to create perceptible improvements in their lives or livelihoods. These groups had always been poor and remained so.

Moreover, the reach of the development programmes has been uneven and confined to the more articulate groups among the poor, ignoring the majority. To planners, fisheries has always been synonymous with fishing operations. The economic activities carried out by dozens of other important stakeholder groups have received only marginal attention in the programmes. Even among producers, boat owners cornered much of the support, while the others were expected to benefit from trickle-down effects. A significant number of people who could not take advantage of the new opportunities were precipitated to the bottom as the 'invisible poor'. As the present field study shows, it takes special efforts even to identify and locate the poorest of the poor in any village.

This shift from 'primitive communism' to capitalism took place relatively recently (in less than 40 years) and the process continues to unfold in some parts of Orissa. Similar shifts in the nature and orientation of operations can also be observed in other activities such as processing and trade, which are often interlinked.

Productive assets are owned communally in some areas, whereas in others the crew contributes a part or the whole of the net requirements, while the boats are owned individually. In more advanced fishing economies, the owners contribute everything and crew is recruited solely for its services. The three fishing classes can thus be categorized as: (i) owners (of craft and gear or part of the gear), who may or may not participate as crew members; (ii) crew members contributing pieces of gear; and (iii) crew members that do not contribute any equipment and work solely as labourers.

Dahl and Forsgren (1988: 18) note that among the three economic strata they observed in Pentakota, marriages were preferably arranged within the same economic stratum, indicating that these categories also carry social meaning. Many categories are discernible even within the boat-owning class, ranging from those with non-motorized wooden catamarans (or even simpler contraptions) to those owning a large Sona trawler. There is an increasing concentration of ownership of assets in the hands of trader-financiers – who are often outsiders – at the expense of traditional fishing castes and classes.

Family size and status in fishing communities

Universally, fishing communities have a propensity for large families. High child mortality rates among fishers may have created some pressure to produce more children, but there was also an important economic motive. Open-access economies such as artisanal fishing, which are characterized by low investments and simple indigenous technologies, depend as much on physical labour as on technology for their sustenance. The relative simplicity of activities such as boatbuilding, net making and post-harvest disposal tasks, coupled with 'the seas swarming with shoals of fish', allowed large families to extract as much from the sea as possible and to share production and marketing tasks.

By the late twentieth century, health care had improved, child mortality rates had decreased significantly and longevity had increased. These developments were in step with the golden period of fishing on the east coast of India during the 1970s and early 1980s, when the numbers of fishing boats – both traditional and modern – as well as work opportunities increased significantly.

By the early 1990s, however, there was a decline in catch per unit effort and in overall catches, leading to downsizing in the fishing fleet. Simultaneously, the population explosion of the 1970s and 1980s led to the emergence of a large productive-age population with fewer opportunities for work. Traditional technologies that depended on manual labour and skills became largely redundant. The marine sector witnessed a process akin to the agrarian sector's splintering of larger landholdings into smaller ones,

and reduced work opportunities due to population pressure. The marine sector was faced with increased unemployment, competition for work and depression of wages.

As a result, it has become difficult for fishers to provide for large families with their meagre earnings. For labourers without assets, such as members of fishing crews, the large families that were once considered assets became liabilities. Although it could be argued that joint families are better equipped to cope with lean periods, such arrangements also bring friction in familial relations. It became necessary for sons to move out immediately after marriage.

Another factor contributing to the nuclearization of families is the influence of television and cinema. These media, particularly television, have brought about a cultural revolution in fishing villages that has been as important as any change in the sector over the last fifty years. Media exposure has altered the priorities, needs and aspirations of the younger generation. This, coupled with the increased awareness created by improved literacy, has encouraged a break from the joint family tradition and a reduction in family size.

Within small families, there is a marked preference towards shifting children from fishing into other occupations – preferably service-oriented. This arises from recognition of the unsustainability of fishing as a livelihood, as well as from a desire for the upward mobility that white-collar employment is supposed to bestow. Once a family moves away from a primary-sector livelihood based on an open-access regime, the importance of a large family diminishes.

In addition to these factors, an increased awareness among fishers (particularly women) as the result of years of family planning campaigns by the Government has contributed to bringing down the average family size in fishing villages.

Families that have more children – due to a lack of awareness or for religious/social/cultural reasons, but quite often for economic reasons – are generally poor. Their parents' earnings being insufficient to feed the whole family, children begin to work as soon as they can, often from the age of five. Children from large fisher families constitute the majority of child labourers at any landing centre. It is also in large families that food insecurity is most prevalent, and this becomes even more serious during lean fishing periods. A large family needs substantial sums of money to meet food needs and tends to be deeply indebted at very high rates of interest.

The disintegration of the joint family system has worsened the condition of the elderly, who are largely left to fend for themselves. This has led to an increase in the number of destitute families comprising people too old and infirm to engage in productive activities.

Community organizations

The degree of organization among small-scale fishers in Orissa is low, and their diverse origins – Bangladeshi, Bengali, Telugu and Oriya – preclude their coming together for collective and effective articulation of their views.

The most important social change in the coastal fishing communities has been the formation of women's self-help groups (SHGs) by the Government and by NGOs. These initiatives, aimed at the social and economic empowerment of women, have taken a holistic, participatory and integrated approach to community institution-building and have begun to yield encouraging results (ICM, 2002a). After the 1999 cyclone, many initiatives were launched with women's participation and these have helped consolidate the groups into clearly definable and independent entities.

However, questions remain as to how far the poorest of the poor have managed to take advantage of the group efforts in the villages. NGOs serve only a few villages, and a large number of fishers remain unreached. The control of local elites over processes of group formation and functioning remains problematic; even intermediate agencies depend on the patronage and support of these elites to function in the villages.

BOX 6
Samudram

Samudram represents an outstanding display of changes in the traditional depiction of woman as the eternal martyr. It developed as a state-level federation of women fishworkers' organizations in 1993, with the objective of 'empowering women fishworkers in all aspects of life'. The headquarters of the organization is at Kothuru village in Chatrapur block of Ganjam district, and its membership exceeds 2 000 women in the districts of Ganjam and Puri. The organization has also spread to Balasore and Bhadrak districts in the north. Members of Samudram have been assuming increasingly powerful roles in managing the daily affairs of the community. The key to their success lies in the way they involve local youth groups, traditional panchayats, or councils, and Panchayati Raj institutions in their programmes by demonstrating convincingly that women's problems are problems of the whole community. Samudram has mobilized against issues as diverse as the sale and consumption of country liquor, gambling, child marriage, illiteracy, medical quackery, moneylenders, low wages, teacher absenteeism in government schools and malfunctioning of the PDS. In some villages, women's groups took over management of the PDS. Samudram has also been active in protests against the invasion of trawlers, violation of the Coastal Regulation Zone Act, and collection of shrimp seed, besides demanding the inclusion of women in various government support schemes.

Most women have become literate enough to negotiate and strike good bargains for their produce. There are many women in the villages trained to take care of emergency medical needs. In most of the villages, moneylenders have been expelled and group members take care of their credit needs with their own funds. Many services in the villages – health, education, community strengthening and credit and savings programmes – have now been taken over by the women's groups, which make payments to teachers and health assistants and maintain records. One important feature of Samudram is that its leadership is dispersed widely over different villages, so there is little possibility of the emergence of a single concentrated power centre. Although it is a collective of fishworkers' organizations, each organization has its own programme and agenda and the freedom to discuss and debate its extent of involvement in Samudram activities. The same relationship exists between Samudram and the Orissa Traditional Marine Fishworkers Union (a men's body), which operate side by side.

Many women indicated that they could not afford the time, effort or money required to become a member of an SHG or were simply left out. One indicator of poverty identified by fishers is the 'ability' of a woman to become a part of an SHG. This is determined by her social and economic status, livelihood profile and ability to invest time and effort in the venture. In other words, a really poor person is one who cannot become a member of a group because of various factors – both formal and informal. Indeed, this is a sad reflection on the situation, as the poor were the intended beneficiaries of SHG activities.

There are also questions about the singular emphasis on women in community development efforts. Besides making the men feel left out, this could create increased pressures on women to live up to expectations, particularly in terms of credit and marketing management. Support for even predominantly male-dominated activities such as fishing are increasingly channelled through women's groups. This appears in many cases to have become a burden on the women, as they are expected to recover the loans on behalf of the lending agency.

Many NGOs work on specific issues such as conservation and management of natural resources, health, education and asset creation. Unfortunately, their interventions do

not often add up – except tangentially – to a consolidated and integrated effort at poverty alleviation. Fisheries is considered a 'technical' subject even in NGOs, and all the needs of fishers are expected to be met by the provision of technical tools. As a result, larger issues related to resources, livelihoods, policies and poverty – and the linkages between them – remain underexplored and poorly addressed.

Of late, an active movement of fishers at the state level has been taking shape, with Ganjam district as its base. There is a historical reason why Ganjam is the appropriate leader for grassroots institutionalization: this is the district in which fishing activities were worst affected by the encroachment into inshore waters by mechanized boats from neighbouring Andhra Pradesh. The initial successes that fishers encountered in this struggle paved the way for more proactive efforts at mobilization and unionization of fishers across the state (Box 6).

Cooperatives

Cooperatives (or societies) have been used to channel development credit to the fisheries sector. The record of cooperatives in the sector is not very encouraging. Although they were promoted with financial support from the central and state governments, their role in improving the lives of fishers has been limited. The Eighth Five-Year Plan (1992–1997) stated that except in Maharashtra, Gujarat, Tamil Nadu and Orissa, fishers' cooperatives do not play any significant role in the development of fisheries (PHFP, undated a: 28). A study conducted by the DFID-funded PHFP found that less than 10 percent of the marine fishers in Orissa were members of cooperative societies. Seven percent of the fisheries cooperative societies in the state were marine, although they accounted for 21 percent of the total membership (PHFP, undated a: 58). In 1997, there were a total of 616 fishers' cooperative societies in Orissa, including six apex societies, with a total membership of about 70 000 people (DOF, 1998: 95). The PHFP study (66) concluded that the primary cooperative societies were credit-starved and most of them were defunct. In the villages in which field research was conducted, cooperative societies seem to have been confined to paper and to a handful of people with strong decision-making powers in the community.

In hindsight, the expectation that societies would act as a just and transparent link between the communities and the state appears unrealistic. The leaders of societies often came from the socially influential, politically active and economically powerful sectors of communities. It was optimistic to the point of naivety to believe that they would allow genuinely democratic decision-making processes to take root in these societies. Some of these leaders strove to maintain social cohesion in the villages, ensured equality of opportunities where they could, and represented the majority viewpoint when it came to dealing with outsiders, but they were seldom democratic. Members who spoke out against any of their dealings would invite their wrath, which could manifest itself in many ways.

Availability of and access to financial assets

Changes in sharing patterns

In fishing communities, sharing systems originally ensured an equal share for all who participated in fishing operations, plus a share for craft and gear. The latter was meant to account for depreciation, repair, maintenance and a certain return on the investment. In the event of a poor catch, shares to boat and gear were reduced to ensure a minimum income for the crew. In villages such as Balarampur in Balasore, there were very few things that the community members did not share. Being uniformly poor makes sharing an important coping mechanism against deprivation, a cost-reduction strategy and a means of maintaining social cohesion.

However, once the procurement of an asset becomes a cash transaction requiring higher levels of investment and promising better returns, there is a tendency for the

ownership to pass into the hands of a few enterprising people, while their erstwhile partners are relegated to being wage labourers. In most fishing villages, fish catches used to be shared equally among crew members, with additional shares for the boat and net – a practice that still persists in some villages in Ganjam district. Fishers used part of the fish for their domestic consumption, and the women carried the rest to the market for sale. Thus the widely held supposition that fishers' wives sell their husbands' catches was valid at one time.

Changes in marketing patterns – from local to international, from fresh to processed or frozen products, from informal to cash-based transactions – brought about changes in sharing patterns. Fish became too expensive to be consumed by fishers, and pooling the catch helped attract the attention of traders. Crew members thus shifted to selling fish collectively and sharing the *cash returns*. The boat owner's wife, who used to double as a fish seller, could no longer take the catch for granted and had to participate in auctions like everyone else.

In due course, the boat owners, by virtue of their leading role in selling their boat's catch, found it worthwhile to collect the catch from other boats in order to accumulate bulk. The increasing complexity of marketing activities meant that some boat owners became trader-financiers and acted as conduits between other boat owners and traders. For traders from outside, this arrangement proved satisfactory because, in addition to assuring them a regular supply of fish, it gave them access to fish from several boats at a much lower level of effort. They could pay advances to a few boat owner-traders, who were considered creditworthy because they had assets and were trusted in the villages.[5] These boat owners also often advanced a part of the amount they received from traders to their crew and took responsibility for collecting on these advances. The advance system thus bound a crew member to his boat, the boat owner to the local trader-financier (who was once a fisher himself), the trader-financier to the outside trader and so on. It created a complex web of credit relationships, which encompassed virtually all categories of fishers and traders.

An important aspect of this system is that it developed in a top-down fashion. Growing international demand and the rising supply of seafood through the 1980s and the 1990s (mainly as a result of intensified fishing) encouraged traders to pay ever-increasing advances to local financier/traders and through them to boat owners and crew in places such as Puri and Paradeep. Because the opportunities for growth were seen as endless, with the Government also providing attractive incentives to enhance fishing efforts, there was a rapid increase in numbers of fishing boats, which led to an increasing demand for workers. This was also the period in which artisanal boats coexisted with the new classes of boats and made good profits. The advances soon reached astronomical proportions – up to Rs40 000 per season per boat. Even as the downtrend began in the mid-1990s, the emphasis shifted to retaining 'good' fishers – those who were reputed to know the good fishing grounds and could still bring in profits. Advances continued to remain high, although the number of people receiving them decreased. Older and not-so-skilled fishers received short shrift in the process.

The owners also had another motive in recklessly increasing advances to the crew. As advances mounted, the share given to the crew declined; with interest-free advances running into tens of thousands of rupees, the crew were in no position to demand bigger shares. The share for the boat and nets increased, reaching up to 50 percent of total returns, in order to pay for maintenance of the boat and service the loans that the crew had received. Frequently, owners received much more than the interest due for their advances. The new owner-crew relationships redefined traditional systems of sharing, and crew members gradually became wage earners, although still retaining a share in the catch (Johnson, 2001; Gustafsson, 1994).

[5] It is much less common for crew members to become fish traders.

BOX 7

Case study: changing pattern of ownership of beach seines

Beach seines – of which there are many variants in Orissa – were traditionally owned by a group of fishers, who contributed a piece of net each. This was at a time when net making was a manual operation and fishers made their own nets using cotton. It was the responsibility of individual fishers to mend their nets regularly and, if a piece of net was not repaired, the fisher was excluded from the group. The members shared the returns equally among themselves. This is a pattern still prevalent in northern Orissa.

As synthetic and machine-made nets came on the scene, beach seines began to be made by cobbling together nets of different mesh sizes, but because it was possible to buy nets off the shelf, ownership of the nets increasingly came to be concentrated in fewer hands. Beach-seining with synthetic gear also proved to be a very lucrative activity in the beginning – i.e. in the1980s – so individuals began owning nets and taking on crew as labourers on a share basis. The owners took half the returns, while the crew shared the other half equally. This pattern can be seen in southern Orissa, particularly in Ganjam district (Nolianuagaon).

As beach-seining has become increasingly non-viable commercially, there is once again a trend towards communal ownership of the nets. Individuals are starting to sell off their nets to groups of fishers, who share the cost of purchase equally. Whereas earlier fishers *contributed a piece of net* each, now they *share the cost of buying a net.* The returns are shared at the rate of two shares per member – one share for his investment in the net and the other for his participation in the fishing activity. If a member does not take part in fishing on a given day, he still gets a share for his net, while the fisher who takes his place receives the other share. This has the advantage of enabling fishers to spread the returns over a large number of families, albeit very thinly. The meagre amounts that individual fishers obtain from a day's fishing indicate that beach-seining has once again become a subsistence-based occupation. Many unemployed fishers in the villages can at least hope to earn something by pulling a beach seine. This pattern is also emerging in the Srikakulam district in Andhra Pradesh, which is adjacent to the Ganjam coast in Orissa.

Successive failures of fishing seasons from 1998 onwards (and the fear induced by the cyclone of 1999) are said to have brought advances down to more modest levels, although there are increasing instances of default as evidenced in Puri. Speculative credit relations in which the amount of credit was much higher than the net worth of the borrower made the activity unviable, but forced participants to play it out with a sense of fatalism. By the late 1990s, things reached a stage at which the advance paid to a fisher could scarcely be recovered even in a good year. Consequently, the loans began to be 'rotated' among boat owners, though seldom actually repaid by the crew members themselves. The loan burden thus keeps moving from one owner to another, trapping both the owner and the crew member in a vicious cycle that neither can exit. The relationship between traders and boat owners falls into a similar predicament, with the outstanding credit being rotated from one boat owner to another rather than ever being fully repaid.

Interestingly, the gradations in sharing patterns can still be seen as one travels from the northern to the southern zone of the Orissa coast and also from remote rural areas to well-connected urban areas (Box 7). In the northern zone, each crew member has to contribute a piece of fishing net in order to obtain a share of the catch. If he cannot do so, he receives only a fixed daily wage, which is much less than a share (BOBP, 1984b: 13). In the southern zone, the role of crew members was traditionally confined to providing labour, while the assets – boat and nets – were owned by individual

households. Tietze (1985: 86) attributes the differences in sharing between northern and southern zones to the fact that marine fishing in the south was a much older activity with a well-established pattern of economic stratification, whereas in the north it was not so clear. However, it has been observed that with increased motorization, use of synthetic nets and other developments, this stratification took root in the northern zone as well. In the Rajnagar area, it was found that boat and nets were owned by single individuals and the crew provided only labour. After the operational costs were deducted, the owner and crew shared the returns equally, which is a system that was originally prevalent in the southern zone.

Savings

Artisanal fishing communities are notorious for their extravagance and lack of savings. While this partly derives from the low surplus in their earnings and the need to apply this surplus to lean periods, it also has to do with the lack of a savings culture. This in turn may be attributable to the nature of the fishing occupation, which traditionally – unlike agriculture and other primary occupations – provided for fishers' needs on a daily basis and in relative abundance. Their investments were low and fishers had relatively few needs that required cash. Whenever they went to sea, they could hope to earn enough to subsist. As part of the catch on good fishing days is donated to old people, widows and children, it can be assumed that even 'retired' fishers had a sense of security. They had no reason to believe that the future would be any different and so saw no need to save for a rainy day.

But there is also evidence that fishers *did* save as a matter of course. Their savings initially took the form of productive assets related to fishing. Over time, they included investments in houses and land for homestead and agricultural purposes. For the poorest, savings took the form of thatched huts, a few silver ornaments and, in the southern zone, a few brass vessels. Many brides carried brass vessels as dowry to their in-laws' homes. When stainless steel first made its appearance in the mid-1970s, it took the place of brass for a while, but once it became commonplace, brass reasserted its supremacy.

It is only in recent times that their savings systems have collapsed. In poor households, it is now difficult to find any 'assets' that can be converted into cash. Most families have little – at most perhaps a transistor radio – in their sparse thatched houses. Brass and silver items usually find their way to the pawnbrokers with little hope of recovery.

Informal credit

Women continue to have some modes of access to cash: first, as members of NGO-supported self-help groups, and second, from itinerant moneylenders. Banks are almost entirely out of reach, except when a group is specifically made to open an account to receive government or NGO assistance. Some well-off families have opened bank accounts. Most NGOs maintain bank accounts in the name of self-help groups, but tend to take care of the transactions themselves or through their village-level workers.

Moneylenders may be established, large-scale operators or itinerant, door-to-door purveyors of credit, while traders advance supposedly 'interest-free' loans in return for guaranteed supplies of fish. The costs of informal credit are sometimes overt and more often hidden or masked, but in all cases they are very high (ICM, 2002a). Itinerant moneylenders help women save their money on a daily or weekly basis: they collect the women's savings – 1 or 2 rupees a day – and record them on a chart with several boxes. When all the boxes in the chart are filled in, the women recover their savings minus a fixed sum towards 'administrative' costs. Thus, contrary to general practice, the poor have to pay a fee for saving money!

Some non-banking financial institutions (NBFCs) have tried to adapt traditional money lending and saving systems – based upon daily savings or repayment – with good

success in fishing villages. However, when the NBFC fails at the macro level (something that happens with unfailing regularity), fishers lose badly. Also, in several cases, agents of the NBFCs have been known to run away with the savings of their clients.

Borrowing money from neighbours is the most prevalent system among fishers, particularly for the very poor. Some women also raise poultry and other livestock as an investment – to meet the food needs of the family and obtain other necessities during lean periods.

Credit-market linkages

Changes in fishing systems – from subsistence-based activities to commercial operations; from simple, low-cost operations to comparatively high-tech, high-investment operations; from catering to local markets to exporting to sophisticated international markets – have brought about drastic changes in marketing systems (Box 8). For fishers, increased demand for fish but decreased catches have meant increased investments in fishing craft and gear to enable them to fish in new grounds or for longer durations or more efficiently. Increased investment in cash-starved artisanal fishing economies could only come from outside, private moneylenders and traders being the obvious sources.

The increasing demand for fish in international markets increased credit flows into the community. Although the system of traders advancing money to fishers in return for fish is an old tradition, the amounts given out as advances in recent times had escalated to clearly unsustainable levels. Initially, giving large advances to fishers had many advantages for traders, besides ensuring that fishers would remain bonded to the trader until they repaid the loan. It was believed that seafood production could increase only by deploying more efficient fishing systems and that this investment

BOX 8

Evolution of credit–market linkages

Three stages can be seen in the evolution of credit-market linkages in the fishing sector. In the first stage, which prevailed until about the 1960s, there were no traders to speak of in the fresh fish sector, given the absence of demand from distant markets. There were some dried fish traders, but the amounts they advanced were not significant. Fishers' sole source of credit was village moneylenders, who charged high rates of interest. Such exploitative rates continued even into the first few years after fresh fish traders began advancing loans. However, these were governed as much by the lack of infrastructure and the risk that the traders carried as by the needs of fishers for the loan.

The second stage was characterized by a system in which the relationships became more balanced, as a result of increasing demand, technological sophistication and, perhaps most importantly, competition among traders. The cost of credit came down significantly and traders were more interested in ensuring supplies of fish than in making returns on their investments.

The third stage began in the mid-1990s: fishers suddenly found themselves in a bind. On the one hand, the resource on which they counted to take care of all their current and future debts appeared to have fallen below subsistence levels; on the other, their outstanding debt with traders was so high that even if they sold all their assets, they would not be in a position to repay their loans. The traders faced a similar predicament: they could not depend either on the catches or on the ability of fishers to repay. In order to make the best of a bad investment, they tended to take over boats where possible. All fresh loans have come to be characterized by very stiff conditions, taking the relationship back to where it began!

would bear fruit in the long run. Large advances also put pressure on alternative systems in governmental, NGO or cooperative sectors to come up with equally large and unsustainable sums of money. They reduced competition from other traders and facilitated the formation of trader cartels. In essence, the system represented the tested market strategy of hounding out competitors from the field by underbidding or overpricing the product to unsustainable levels. This kind of support from traders provided fishers with a false sense of security, with serious implications for everyone, including the traders themselves.

Fishers recognize the inherent risks facing any trader dealing in a perishable commodity such as shrimp. They also recognize that the services provided by traders in the villages are not easily taken over or even supplemented by other welfare and development agencies. However, their dependence on traders and middlemen has an impact on their ability to diversify or improve their livelihood profiles in any other way, because taking loans is often an irreversible process. While taking advances from traders was once an indication of fishers' self-confidence, it has now become a survival strategy. The advance system has allowed fishers to obtain loans far beyond their ability to repay, often even after selling their productive assets. As a result, they are forced to stick to fishing regardless of its viability.

Traders are increasingly reluctant to invest in capture fishing for shrimp because of the uncertainty of supply, and they are attempting to extricate themselves from their relationships with fishers. Many fishers remain linked to one trader for long periods because they are unable to find a more lucrative arrangement with other traders and are unable to repay the loans to their respective traders on their own. The traders in turn restrict their relationship to a few long-term associates among fishers, and buy the remainder in open auctions or from aquaculturists.

This is one reason that fishers suggest that boat owners are in a far more vulnerable and risky position than crew members. The latter have the freedom to move from one boat to another, from one activity to another, and from one sector to another. The boat owner is literally wedded to his boat because of the credit linkage, and can come out of it only when he earns enough to pay off his old debts.

Credit for domestic needs and consumption is linked to the fisher's ability to repay or, rather, to the trader-financier's perception of the fisher's ability to repay. When a fishing household borrows for domestic needs, it effectively signs away a part of its assumed earnings from the next season's fishing. Taking loans can limit marketing opportunities, as the lender may enjoy preferential rights to the catch at agreed prices. This leads to the family being virtually bonded to a trader, with the trader becoming the de facto owner of the family's productive assets, for what they are worth.

Monetization of transactions and social relations

Social relations in a fishing village traditionally influenced economic activities. For instance, fishers would generally sell their fish to women processors and traders. On occasion, fishers would give the processors time to dry fish and take it to market for sale before expecting to be paid. In effect, then, processors did not need to invest anything up front. This is one reason that processors never satisfactorily answer questions about the amounts of money they invest in the trade. The fact that processors handled fish worth substantial sums of money gave rise to the perception that they were loaded with money, while it is more a reflection of the cash-strapped nature of the fishing economy (Box 9).

An important change in the fishing sector over the last decade has been the increasing monetization of transactions. With the arrival of outsiders, fishers cannot afford to, or do not need to, sell their fish on credit. Even local buyers now need to carry money in hand to pay for fish purchases. The monetization of transactions also means that many social activities – such as helping out with net mending or in fish processing – have become paid jobs.

BOX 9
Coping strategies of poor women

Strategies adopted by some very poor women in places such as Puri show an interesting adaptation. They carry edible tubers or sweetmeats to the fish landing centres. There they exchange them for fish – with fishers or with the many children that roam about the area collecting fish from the catch as it comes ashore. The women 'sell' the fish in the village market or in neighbouring villages in exchange for rice or other food items from buyers, who are often as poor as themselves. The women keep some of their 'earnings' for their consumption and sell or exchange the rest with the local trader for edible tubers and sweetmeats, and begin the cycle once again. In theory, if not in actual practice, this whole transaction – sweet meats for fish, fish for rice and rice for sweetmeats – rarely involves cash.

Formal credit

Many credit systems have been set up with development motives – i.e. to reduce the dependence of the poor on moneylenders, trader-financiers and middlemen. But by failing to recognize the unique conditions that prevail in each livelihood system in the fishing sector, these systems have largely failed to fulfil their objectives. The difference between formal and informal systems of credit delivery is that the former give credit once and expect to be repaid regardless of the ability of the debtor to repay. Informal systems on the other hand, being more commercially oriented, ensure that fishers continue fishing to be able to repay their loans and the sizeable interest on them. Fishers inevitably conclude that the margins that traders tend to maintain are unjustified but inevitable.

Formal credit systems in the fishing sector were introduced to support the diffusion of new technologies, rather than to support and encourage existing, more equitable, systems of operation. They did not attempt to understand the credit needs of the people. For instance, the effects of seasonal hunger and deprivation on the overall livelihood systems of the poor were ignored and consumption credit was actively discouraged. Traditional systems such as fish processing never received the attention they deserved, given the number of people in the very poor category that depend on such livelihoods. Even when credit was extended to those in the fish processing sector, norms were fixed at levels that excluded the real poor from accessing them.

Only fishers enterprising enough to see the potential of new technologies could take advantage of the credit systems set up for the purpose, while the vast majority were either unaware or unable to obtain support. The demand for collateral security has been a serious constraint on the ability of poor people to avail themselves of institutional credit.

Banks, owing to their institutional need to ensure recovery and reduce transaction costs, tend to actively encourage large loans, which can only be taken out by the powerful people in the villages. Many of these loans were never fully repaid. Thus when pro-poor credit programmes were taken up by the Government in the 1990s, many fishing villages could not access them because of past credit repayment records.

In some villages such as Chandrabhaga, fishers complained that official assistance and credit programmes handed out productive assets – boats, engines and nets – at different times or not at all. In some instances, boats were given and nets were not. This badly affected fishers' ability to utilize the assets and reduced their capacity to repay the loans. Institutional credit is also besieged by problems of mounting overdue repayments, shortage of staff, lack of consumption loan schemes, rigid bureaucratic procedures, long delays and opportunity costs. None of the households in the 'poor'

to 'destitute' categories encountered during the field research had ever accessed a loan from any formal system. On the contrary, all of them regularly take substantial sums of money from village moneylenders. They give a number of reasons for not accessing any development credit support, concluding that development loans were either not available to them or were fraught with too many problems and risks.

The BOBP credit project for fishers in Orissa. BOBP supported an innovative credit project in the coastal districts of Orissa from 1982 to 1986. The project aimed to establish direct and long-term links between marine fishers and banks and to demonstrate that credit to artisanal marine fishers was not merely viable but also fully recoverable. The rate of loan repayment was reportedly very good (95 percent) (BOBP, 1987a: 1), prompting the state Department of Fisheries to take the project under its wing. However, interest in the project waned soon after the withdrawal of BOBP and, by the early 1990s, the project was all but abandoned.

Insurance

Insurance is a form of security, but for fishers that spend a large portion of their lives away from *terra firma*, it also provides an important source of comfort. A lack of insurance can spell destitution for fisher families that lose their wage-earners. Fishers' access to insurance is limited to government-sponsored group insurance programmes. Obtaining payments from this scheme is straightforward when the death occurs in an easily ascertainable manner. However, if the death occurs at sea, or when the fisher is away working in another area, the process of recovering payments is fraught with problems. Obtaining documents – such as proof of residence or a death certificate – involves considerable effort on the part of the dependents of the deceased fisher. In villages such as Pentakota and Shandakuda, where fishers lack any legal rights to their homestead land, obtaining death certificates is extremely difficult.

A programme called Janashree is being jointly implemented by the Government of India and the General Insurance Corporation in most coastal areas to insure the lives of poor people. Many fishers have joined this programme as a result of the extension work done by NGOs and DOF, and because of the fears evoked by the 1999 cyclone.

VULNERABILITY CONTEXT OF FISHING LIVELIHOODS

The SLF suggests that the vulnerability context consists of trends, seasonality and shocks. This chapter discusses trends related to the livelihoods of coastal fishers in Orissa, their causes, consequences or impacts, and responses of fishers (including coping strategies). The discussion will also form the basis for deriving indicators of poverty, vulnerability and food insecurity in the following chapter. The section below deals with seasonality and shocks.

Seasonality

An outstanding characteristic of a livelihood based on fishing (or agriculture) is its exposure to seasonality. Seasonal unemployment is not a choice but a compulsion, and the ability of people to cope with this often determines their socio-economic status. This ability in turn depends on the surplus that the individual or group generates during the rest of the year. Where there is sufficient surplus, the effects of seasonality are not very severe. However, in occupations that barely earn enough to meet the daily subsistence needs of the family during the good seasons, the effects of lean seasons can be catastrophic. Even if the surplus generated during good seasons should be sufficient to meet fishers' needs during the lean periods, any fluctuations during the good fishing seasons will have repercussions on them all through the year.

Thus, in the fishing sector, it is not so much the prevalence of seasonal unemployment as the ability of different sectors of fishers to cope with it that determines the extent of

poverty and food insecurity. For some people, lean seasons are an opportunity to relax and recuperate or to repair craft and gear. At the other end of the spectrum lies a vast multitude of people dependent on daily subsistence earnings, who are prone to hunger, indebtedness and ill health or are forced to migrate during lean periods.

As a result of seasonal deprivation, many poor families reduce the frequency of their meals or simply starve for some days in a year. The condition of old people with no support is particularly pitiable during this period. Malnutrition and hunger contribute to ill health, and the correlation between the two is well established, as is the association between lean seasons and the prevalence of illnesses in fishing communities.

Food insecurity is primarily a seasonal feature.

The effects of seasonality last longer than the lean periods. For most fishers, borrowing during the lean periods is obviously a livelihood strategy in itself. This 'borrowing from tomorrow' could take the form of pawning productive assets, selling jewellery or family utensils, entering into trade agreements for the next season's fish catches and removing children from schools to put them to work. When a family forfeits its productive assets, the mere return of a good fishing season is not likely to be of much help. Moreover, fishers repeatedly assert that fishing seasons have become more uncertain over the last couple of decades, adding yet another dimension of complexity and impoverishment to the picture.

The Orissa Department of Fisheries has a savings-cum-relief programme aimed at helping fishers during the lean fishing periods. State and central governments contribute equally towards matching the sum saved by fishers for nine months – up to a set limit – and return the savings in three monthly instalments to fishers. Although well intentioned, the programme suffers from some shortcomings. It only covers a limited number of fishers every year, depending on the funds available. The amount given is too low to address all consumption needs of a fishing household during the lean periods. By confining the scheme to men, it leaves out a large number of women, who often belong to the poorest sectors of fishing communities, are frequently heads of households, and are often the worst sufferers during the lean periods.

Shocks

A disaster index compiled by MSSRF (1999) places Orissa among the most disaster-prone states in the country. The Department of Soil Conservation (DOSC, 1997), in its area development report on coastal Orissa, identifies floods and cyclones as a major issue. Noting that there have been 16 major instances of cyclones and floods from 1961 to 1996, the report documents their enormous and almost irreparable damage to crops, human lives and livestock in coastal areas. Evidence suggests that the frequency and intensity of natural disasters in India have increased in the past decade (MSSRF, 1999: 23), with Orissa at the receiving end of a large proportion of them.

The cyclone of October 1999 is considered one of the most devastating in the history of India (Government of Orissa, 2000: 1/10), spawning tidal waves of over 5 m in height and wind speeds of over 250 km per hour (MSSRF, 1999: 24) and affecting nearly 20 million people in 18 000 villages in 14 districts. It killed nearly 9 000 people and 2.5 million animals, although the deaths of a large number of Bengali and Bangladeshi fishers may have gone unrecorded. Houses, fishing craft and gear were destroyed or washed away in large numbers (see Banerjee, 2001; NIRD, 2001; Parasuraman and Unnikrishnan, 2000; Oxfam, 2000; and CARE 2000). It is often the poorest of the fishers, already caught in a debt trap, who face the worst effects of these disasters, because they are stripped of their means of livelihood (DOF, 2000: 2).

The key impacts of cyclones on the coastal fishers in Orissa include:

- Loss of human life, including family wage earners. The psychological trauma of losing whole families lasts a long time, and the effects of the cyclone of 1999 were still evident at the time of the field study – nearly four years later.

- Loss of productive assets and basic infrastructure necessary for survival, such as houses and cooking utensils. Fishing communities are by far the worst affected in any cyclone because they live closest to the sea; fishing tools and equipment are the first items to be lost in such cases. For the fishers of the southern zone, the loss of fishing tools is tantamount to a loss of livelihood, because they rarely have other options for income generation.
- Loss of livestock. For several fishing communities in the northern zone, livestock are an important source of livelihood, food security and, in some cases, a form of savings. The loss of livestock can have serious effects on the lives and livelihood security of fishers.
- Food insecurity, reflected in the non-availability of food in the short run and a much diminished access to food in the long run. The ill-health and other disabilities prevalent in the aftermath of a cyclone drastically reduce the ability of people to consume food.
- Increased vulnerability as a result of all of the above. Even the increased *sense* of vulnerability makes life more difficult for most fishers. According to many, nowadays even clouded skies or a sudden burst of rain can upset them and their work because they bring fears of another cyclone. In an occupation such as fishing, which involves working at sea for extended periods, the impacts of such fear psychoses on the economic efficiency of fishers is not hard to imagine.

During the monsoon months, all the major rivers in the state discharge their surplus water into the Bay of Bengal and this causes flooding in coastal areas (Government of Orissa, 1996a). In July 2001, Orissa experienced the worst monsoon floods to hit the state in 50 years. Five million people were affected, most of them in the lower reaches of the rivers, i.e. in the coastal areas (Manorama, 2003: 686). The floods washed away much of the infrastructure and productive assets that fishers had received from various development agencies in the aftermath of the 1999 cyclone, effectively ruining their lives and livelihoods once again.

Accidents at sea, trawlers overrunning the fishing nets, conflicts with neighbouring farmers that quickly develop into full-scale confrontations, bans on fishing imposed by traditional village councils to resolve local conflicts, and bans on fish trade by local administrations are some of the unanticipated events that are reported to have serious consequences. The failure of a fishing season is as much a shock as glut landings and the unanticipated arrival of fish in the markets. Various fines and taxes – legitimate or otherwise – imposed when a fisher is caught transgressing a rule or a boundary can in one stroke reduce or eliminate a person's entire working capital.

For many fishers, the most familiar shock comes from moneylenders, who may confiscate a productive asset or the fisher's house if he or she defaults on a loan. By far the most serious shock is the declaration of a fishing area as a protected area, restricting and/or blocking access to it. The effect of such a ban is invariably negative given fishers' lack of alternatives. The displacement of fishers from their places of residence for defence, tourism, industrial, port-related or conservation purposes has been observed in many parts of coastal Orissa.

Other important shocks include bans on fish trade imposed by public health departments, strikes, fluctuation in international demand or prices for Indian seafood, and the spread of epidemics such as cholera. In most fishing villages, fire accidents that gut entire clusters of thatched huts occur regularly. Sudden deaths in the family, serious illnesses, accidents, weddings of daughters, or festivals and rituals can diminish or wipe out the savings of a family and leave it heavily in debt.

The sudden interruption of transport services can also present a shock to fishers in villages, who may be dependent on these facilities. The predominantly private transport systems in the state may stop running for a number of reasons, including competition within and among different categories of transporters, demands for fare hikes or to

protest against police harassment. External events such as political rallies, strikes and festivals can also interrupt their service.

POLICIES, INSTITUTIONS AND PROCESSES RELEVANT TO COASTAL FISHING LIVELIHOODS IN ORISSA

Overview of policies in the fisheries sector

In policy terms, the development of Indian fisheries over the last 50 years resulted in the imposition of a modern, capital-intensive, specialized technology over the existing traditional base, which was largely labour-intensive and of great technical diversity (Kurien, 1991). As a result, community-based small-scale fishing gave way to production based on industrial principles of organization and complex technology in order to feed international markets (Johnson, 2001). This is not unique to fisheries but is a feature of Indian development policy as a whole. Supriya Roy Chowdhury (2002) suggests that "the exercise of economic planning, which began as a part of independent India's developmental agenda, itself was a technically defined activity. However, the emotive and ideological flavour of concepts such as the public sector, socialistic pattern of society and so on imparted a popular and accessible tone to economic policy-making. In contrast, economic liberalization has been by and large the product of the intellectual and ideological preferences of a technocracy put in place and supported by successive governments. While the political class has broadly supported the economic reform programme, the programme itself has a technocratic character."

In sustainable livelihood terms, the fisheries sector in India developed largely on the principle of enhancing *physical* assets – boats, gear, landing centres and other infrastructure (the 'visible' infrastructure) – in order to maximize returns from the exploitation of *natural* assets. Any attention paid to developing other assets – *social, human or financial* – was intended to enable the acceptance of the physical assets. Policies, processes and institutions worked in a way that enhanced the appeal of physical tools. Skills were imparted to fishers to run and repair boats. Loans were made available for buying new technologies, and cooperatives were fostered to channel these new technologies into fishing communities. This emphasis on infrastructure may have been dictated by the fact that physical assets are visible and can be easily installed, whereas developing social capacity is not only difficult, but also problematic – because it raises such issues as empowerment and participation in decision-making.

Fisheries development thus took the form of:

- introduction of mechanized fishing vessels and modern gear materials during the First and Second Five-Year Plan periods (1951–1960);
- increase in the use of synthetic gear materials during the Third Five-Year Plan period (1961–1965);
- introduction of purse-seining during the Fifth Five-Year Plan period (1974–1978);
- motorization of artisanal fishing craft in 1979;
- substantial growth in the motorized artisanal fleet during 1985–1996 (Devaraj *et al.*, 1997);
- chartering of vessels and joint ventures, which began in 1984 (IIM, 1990); and
- aquaculture development in the Fifth, Sixth and Seventh Five-Year Plan periods.

The introduction of these technologies was facilitated by the establishment of trawler development funds, fish farmer development agencies (for promotion of aquaculture), construction and development of fishing harbours and landing and berthing facilities at important ports. There were schemes for motorization of indigenous craft, for introduction of improved beach landing craft, and for reimbursement of excise duty on the high-speed diesel (HSD) oil used by mechanized boats (Government of India, 1996). Credit and subsidies played a key role in the promotion of new technologies. Most bank loans in fishing villages were aimed at helping fishers buy boats. When the

boat owners did not repay the loans, either for genuine or bogus reasons, whole villages were blacklisted and barred from further loans. Even NGO training was often built around specific physical tools and techniques.

There has been little or no support for harnessing traditional knowledge and skills or to enhance people's capacity to develop a diversified livelihood profile. The result is that when the new technologies proved to be *too* efficient and ended up overexploiting the natural resources and hurting the people they were supposed to help, fishers had limited options for enhancing their productive potential or diversifying into other activities. Even when multiple types of assets were developed, the initiatives were not based upon a full understanding of the issues and did not involve fishers in decision-making, with the result that important programmes such as cooperatives and development credit floundered.

Besides its negative impacts on the natural resources and the sustainability of operations, technology-led development had another shortcoming. Access to new technology was dictated by the entrepreneurship of the potential users and it was issues such as political and bureaucratic patronage, ability to invest sizeable sums and social standing in the community that determined who benefited and who did not. In most cases, the real poor benefited only from the trickle-down effects. By making equity secondary to growth, fisheries policies might not have contributed as much as they could have to the livelihoods of the poor. A look at the Ninth Five-Year Plan of the Orissa State Government indicates that the same techno-centric, growth-oriented approaches are being followed currently.

Even in terms of developing quality of life, the emphasis has been on creating infrastructure – roads, buildings, houses, cyclone shelters, electric plants – and not on nurturing people's capacity to use this infrastructure in a productive, responsible and sustainable manner. As their vulnerability increases, it is questionable to what extent the improved infrastructure helps them in overcoming their individual or collective problems. In places such as Pentakota, where infrastructure is relatively well developed, people continue to be as vulnerable as anywhere else, perhaps more than in some other places. It was here that some fishers reportedly committed suicide due to their inability to overcome their debt burdens.

Focus of current fisheries policies

The more recent phase of fisheries development is marked by a number of often contradictory factors. Contradictions arise from the interaction of three compulsions: (i) ensuring the livelihoods of artisanal fishers, who constitute the majority of workers in the sector; (ii) increasing foreign exchange revenues from the sector, which in turn necessitates developing and supporting modern systems of production such as trawlers and aquaculture (these measures are often seen as adversely affecting the artisanal fishworkers); and (iii) managing and conserving resources in order to ensure sustainable and responsible exploitation. This objective may clash with the other two in some circumstances.

Fisheries management and conservation policies. For policy-makers and administrators, the conflict between livelihood and environmental protection remains an unresolved issue. Because of the close interrelationship between the two in coastal areas, any change in one aspect can have consequences for the other and policies consequently fail to achieve their objectives, whether development-related or conservation-related. Moreover, by alienating fishers from decision-making roles in the new management systems, the Government has virtually assumed the entire burden of implementation of conservation and management plans, a huge task that it cannot adequately carry out on its own. As a result, most management plans remain confined to paper.

All coastal states in India have their own coastal zone management plans. The Coastal Regulation Zone Notification (CRZ Notification) of 1991 demarcates the coastal zone

into different subzones, with a view to protecting it from degradation as a result of human activities. The Aquaculture Authority of India seeks to regulate the proliferation of aquaculture activities in coastal areas. In order to address declining fish catches, some laws also attempt to conserve coastal resources. Besides DOF, other agencies, including the Department of Forests, the Ministry of Defence and the Department of Tourism, also place restrictions on fishers' access to their traditional resources.

Some of these laws, such as the Orissa Marine Fishing Regulation Act (OMFRA), also attempt to protect the livelihoods of the poor. This act came into force in 1984 (DOF, 1998: 84), mainly to protect the interests of traditional fishers by restricting the fishing operations of mechanized trawlers to beyond 5 km from the shore. The act also tries to prohibit the fishing activities of trawlers from neighbouring states. But this objective may not have been effectively achieved, judging by the case of Ganjam district, where violent clashes between trawlers from Andhra Pradesh and the traditional fishers of the Gopalpur area are reportedly a recurrent problem. However, the subsequent inclusion of a ban on shrimp-seed collection in the OMFRA indicates that the main focus of the act is gradually shifting from protecting people to conserving natural resources *at the cost of people's livelihoods*, which, as experience has shown, is self-defeating.

The Government of Orissa made turtle excluder devices (TEDs) mandatory for trawlers operating in the state, based on regulations of the United States Food and Drug Administration. However, many trawler crews reported that besides causing operational inconvenience, TEDs also allowed many fish and shrimp to escape from the catches.

The establishment of a marine sanctuary covering an area of 40 km in Kendrapara and Ganjam districts – for five months in the year to protect the endangered Olive Ridley turtle – has affected the livelihoods of fishers living in villages in the protected belt. The period of the ban coincides with the good fishing season for these fishers, who calculated that nearly 70 percent of their annual income was earned during these months. Fishing in Chilika Lake is also seasonally curtailed to protect crocodiles, dolphins and migratory birds.

Besides curtailing fishing operations in parts of the coastline, the Government also established a marine wildlife sanctuary (Gahirmatha) in the mangrove zone north of Paradeep, which covers a wide area of mangroves and other coastal ecosystems considered to be under threat. Not only is fishing banned in these areas, but fishers are not even allowed to travel through the creeks to their fishing grounds. NGOs and international agencies report that these restrictions have severely hurt fishers' livelihoods.

While the rationale for such restrictions is undisputed, their failure to address the needs or the opinions of people dependent on those resources creates serious negative impacts, renders fishers hostile to the objective of environmental conservation, and makes the laws difficult to implement. Moreover, imposing regulations on one sector of the people without a thorough assessment of the comparative impacts of traditional and modern operations is regarded by fishers as not only inequitable but also largely useless, because the larger processes contributing to the destruction of biodiversity continue unimpeded.

The Government's programmes for joint forest management (JFM) do provide for the active participation of local communities in the conservation of their resources, and fishers in Bhitar Kanika have reported improvements in the conditions of their access to natural resources after the setting up of JFM committees. However, effective participation of communities is contingent upon the people's awareness of the programmes and the government functionaries' interest in involving people. JFM has reportedly worked where the above two criteria were met, often mediated by NGOs and grassroots groups. In other places, JFM merely served to reinforce the status quo.

Livelihood improvement. An important aspect of development in the fishing sector involves enhancing fishers' livelihoods as well as developing livelihood alternatives.

BOX 10
Aquaculture

The main objective in promoting aquaculture was to provide suitable alternatives to marine fishing. Like agriculture, aquaculture also presupposes land ownership. Thus the broadening of access to aquaculture implied a redistribution of existing land-ownership patterns, which has only been addressed perfunctorily. Because land ownership is confined to a minuscule percentage of people in fishing communities, the number of people that could become aquaculturists was limited. However, the potential for aquaculture to provide employment in some coastal areas – such as the Chilika Lake area, Astaranga block in Puri, and Kendrapara and Balasore districts – was considerable.

In practice, aquaculture in the coastal areas has come to be seen as responsible for the degradation of the natural environment, including destruction of fish populations, pollution, spread of disease and loss of fishing grounds. Fishers in the Chilika area faced a loss of livelihoods as a result of the spread of aquaculture in the area. Their efforts to stop development of a major aquaculture project proved successful, but aquaculture entered the area by other means and has affected the life and livelihoods of coastal communities.

The large and increasing number of poor people in need of sustainable livelihoods makes the task a hard one. Solutions need to be sufficiently broad and resilient to absorb the large coastal populations. The paucity of opportunities means that whatever options do exist tend to be promoted across a wide spectrum of people, without taking into consideration their ability and access to the required assets. In other cases, technological interventions have been seen to exacerbate rather than solve the problem of generating and sustaining livelihoods. Coastal aquaculture is a good example of both these concerns (Box 10), although it can be said that this is valid across almost all livelihood enhancement programmes – motorization, FRP boats, iceboxes and so forth.

In other instances, the introduction of technologies benefiting one sector adversely affected the livelihoods of people in other sectors. For instance, the increased use of plastic crates by fishers in a village diminished the market for basket weavers, who depended on fishers for custom. The increased use of ice, similarly, could affect traditional fish processing operations.

There are a number of state initiatives to provide training to enhance people's skills, knowledge and ability to diversify. These are often linked to attractive support packages, including credit, subsidies or new marketing opportunities. However, these have failed to fulfil their objectives. Among the reasons cited are: lack of initiative on the part of the people; short-term orientation and overly technical bias of the new activities; rigid implementation of the programmes; insufficient support offered; and failures in marketing systems.

In the NGO sector, there is generally a better understanding of the current situation in coastal communities, owing to the regular interactions with the people. Most NGOs use participatory approaches to assess needs and implement programmes. Thus it is not surprising that the issue of loss of livelihoods crops up more frequently in NGO programmes. Many NGOs have started working to provide alternate income-generating opportunities for the coastal poor. However, many problems continue to beset NGO initiatives. Although problem identification is done through participatory approaches, the identification of solutions often is not. This stems from the fact that fishers themselves often do not seem to be able to articulate their views regarding probable solutions.

Traditions and culture play an important role in the choice of livelihoods. The tendency of NGOs to emphasize sector-based options stems to some extent from this

awareness. Many fishers consider it beneath their dignity to work anywhere except in the fishing sector. While this may be dismissed as a conservative attitude, particularly when their families suffer badly as a result of poor catches, it must be recognized that cultural factors are often very deeply ingrained. When NGOs discussed the option of making baskets – which are highly marketable within these communities – with the fisherwomen in Ganjam district, the women rejected the idea as unfeasible. Traditionally, basket weaving was an occupation confined to a particular caste considered socially inferior to fishers.

Most NGOs that work primarily with women's groups in the fisheries sector identify post-harvest activities as being the most appropriate for meeting their livelihood requirements, and they develop programmes to train women and to initiate post-harvest enterprises. Sometimes the abundance of a particular asset – say Palmyra trees – is taken as the starting point to initiate a programme for making baskets, mats and other materials using the leaves, without taking into consideration the skills and aptitude of the people or the market potential for such interventions (UAA, 1999).

Although the need for livelihood alternatives is widely recognized and many efforts exist to address the issue in a meaningful way, the efforts fall far short of the requirements. While this is a reflection on the relatively recent origin of the problem, the need for a more urgent response becomes crucial as the number of people requiring rehabilitation seems to be growing rapidly.

Economic liberalization policies. The programmes of economic liberalization and integration into international markets, which began in the 1990s, coincided with an increasing realization that any further increase in fish production was not possible from marine sources and that most inshore fisheries were already overexploited. The emphasis placed on post-harvest fisheries during this phase had a two-fold objective of optimizing the utilization of a declining resource and taking advantage of the growing international demand. Improved infrastructure enabled fishers to reduce losses, transport fish farther and faster and offset the sizeable declines in catches, which they had begun to experience since the mid-1980s.

Access to international markets thus necessitated a reorientation of production, processing and trading systems, an upgrading of infrastructure and, most importantly, *formalizing* the functioning of these systems. The European Union (EU) import regulations in relation to fish and prawn products had an impact on those exports, because they demanded specific health and hygiene standards, product quality and types. Many processing plants opted to switch over to Southeast Asian markets, which often repackaged the products and sold them in the US, while a few made the change to the EU-supported Hazard Analysis and Critical Control Point (HACCP) regime. Recent studies (Clucas *et al.*, 2003) indicate that international quality regulations have forced the industry to undertake process improvements at all stages of production.

The quality assurance mechanism outside of the processing plants remains weak, especially at landing centres and procurement points. This limits the competitiveness of the industry as a whole in international markets, with possible downstream effects on the poor, although the latter has not been clearly established. However, these effects are likely to be accentuated if EU type legislation becomes more stringent or is enforced more rigorously. Stricter regulations and enforcement – especially with regard to traceability – could have significant impacts on the poor.

As it is the *informal* nature of fishing activities that enables a large number of the poor to make a livelihood, formalizing the structures, systems and processes may result in marginalizing a large number of stakeholders. The changed seafood legislation in the country in the late-1990s as a result of EU regulations may not have had a *direct* influence on people in the sector (see ICM, 2002b). Nevertheless, the potential for such effects is certainly there, as evidenced by the growing dependence of the industry

on export markets and the crises that seem to hit the export industry with alarming frequency.

Policies for basic rural infrastructure development and services

The government has engaged in programmes to improve the conditions of fishers' housing, drinking water, health, education, transport and communications networks, which have been briefly touched upon in the foregoing sections. There are positive discrimination policies aimed at assisting the poor on the bases of occupation, gender, age, caste, economic class and disability.

Institutions in the fisheries sector

Policies are implemented through a range of institutional structures and frameworks – traditional or modern, formal or informal, governmental, non-governmental, quasi-governmental or private sector. These may act either as facilitators in improving the livelihoods and quality of life of the poor or as filters in reducing their access to positive discrimination or support policies. They also often serve to enforce legislation/regulations curtailing poor people's access to the natural resources that form the bases of their livelihoods.

Traditional institutions

Fishing communities in southern Orissa were dominated to a large extent by a single caste grouping (Tietze, 1985), which made it the 'dominant caste', and decisions taken by the elders of the 'caste panchayat' were binding on everyone in the village (BOBP, 1984a: 8). For centuries, the Chilika Lake area was managed by traditional fishing communities through their system of caste panchayats (Mishra, 1998: 79). Northern-zone villages appear to have less organized traditional systems of management. This may be explained by the fact that marine fishing itself is a relatively new activity in the area. Still, it is possible to find rules governing access and extraction of resources from the creeks and backwaters, as well as for nets such as the *bedha* nets.

Traditional caste panchayats in the southern zone had a number of functions, including social, cultural, religious, administrative, development and welfare activities. They supervised caste behaviour and enforced caste norms and customs. Breaches of communal laws, marriage disputes, family problems and other intravillage social problems were brought to the caste panchayats for settlement. The panchayats also adjudicated the division of property, collected money for festivals, settled disputes between net owners and labourers and even had the right to ban fishing on particular occasions. In addition, they played strong roles in the cultural life of the villages by overseeing religious and temple affairs and conducting festivals.

From a fisheries management point of view, caste panchayats played a crucial role in: (i) asserting the community's rights to fishing grounds; (ii) balancing fishing activities with resource capacity; and (iii) establishing rules of access to ensure equitable distribution of fishing rights to all recognized users of a particular resource (Salagrama, 2003). No systematic studies have been carried out to document the traditional systems of management existing in coastal Orissa, but anecdotal evidence gathered during the field studies strongly supports the existence of these systems in several villages.

Recent changes in the larger context of which fishers form a part, as well as changes within the fisheries sector, have undermined the role of traditional systems of community-based management. With the arrival of trader-financiers from outside, the power of village elders to dictate the terms of distribution of benefits from fishing activities has diminished. The fact that many village elders have themselves begun to play the role of trader-financiers or commission agents has hastened this process. The arrival of formal systems of governance such as Panchayati Raj institutions has weakened the

political role of traditional panchayats. Their administrative and development functions have been taken over by bureaucrats and their mass base by NGOs. Exposure to the larger world through television, cinema and newspapers, migration, increased literacy and market transactions has made the younger generations unwilling to follow the precepts of the caste panchayats. As a result, the social functions of the traditional councils have been weakened.

There are indications that this has had a detrimental effect on the lives and livelihoods of the small-scale fishworkers, as well as on their natural resource base. Old people and widows appear to have suffered more from the weakening of customary systems of management, as they used to look to the caste panchayats for some kind of insurance for their food and livelihood security.

Modern institutions

The institutions that play a role in the livelihoods of coastal fishers in Orissa can be classified into:

- community-based structures – formal organizations such as cooperatives and Panchayati Raj institutions; informal institutions such as NGO/government-supported groups of women and youth; and other grassroots groups (religious, political, social and cultural);
- governmental structures – organizations dealing with the development and management of livelihoods (fisheries, forestry, agriculture), welfare (housing, education, health, water, roads); administration (land records, revenue collection, births and deaths registration); conservation and management (environment); law enforcement (police, coast guard); and awareness-building and extension (field publicity). State and central government organizations must be distinguished here, as they often act independently of each other;
- non-governmental development structures – NGOs, bilateral and multilateral development organizations; and
- private structures – informal producers' and traders' guilds.

Obviously, governmental structures outnumber all other institutions in a fishing village, both in number and scope of activities. It is recognized by the central and state governments that policies in different sectors are not always harmonized or coordinated, resulting in duplication of effort or contradictory approaches. Fisher and Mahajan (1997: 135) show that a plethora of agencies – such as the Orissa State Fisheries Cooperative Marketing Federation, Orissa Fish Seed Development Corporation, Orissa Maritime and Chilika Area Development Corporation, Central Fishermen Marketing Cooperative Society (Chilika), Directorate of Fisheries and various fish farmers' development agencies – often have overlapping responsibilities within the fisheries subsector. In addition, policies in other sectors such as revenue, forestry, health, education, transport, energy, agriculture, coastal area management and rural development have an impact on fishers.

One is frequently struck by the realization of how little influence the various research, development and academic institutions seem to have had on the lives and livelihoods of coastal fishers. Apart from DOF, which is fairly widespread and maintains good contacts with fishers for many reasons, fishers are rarely aware of other fisheries related institutions.

Fisheries Department. This is the key governmental body responsible for the formulation of policy and programmes, and for ensuring their implementation. It provides direct support for the expansion of supply from both capture and culture fisheries. It monitors and promotes improved management of resources and actively promotes the involvement of small-scale and poorer participants in the sector.

Bay of Bengal Programme. The work done by the FAO Bay of Bengal Programme during the 1980s, although largely of historical interest now, is still remembered at institutional and community levels, more for its advocacy on behalf of small-scale fishing communities than for specific interventions. It is also remembered for its role in bringing the crucial socio-economic component into the fisheries development discourse.

Grassroots organizations. A number of NGOs work with fishing communities in the state. Their interventions include development activities such as credit and savings, health and education, income generation and enhancement. Several NGOs focus on environmental issues and undertake awareness generation and capacity enhancement among fishers.

Processes that influence fishing livelihoods

Easily the most important component of the livelihood framework, 'processes' seldom receive the attention they deserve. That is because they are conceptually elusive. Their influence is also poorly understood because of their intangible nature and the specificity of their occurrence.

Geographical and linguistic origin

One important structural factor that complicates the geographical isolation of fishing communities in Orissa is the geographical and linguistic diversity of its various fishing groups. Apart from oceanographical features, marine resources and fishing technologies, the northern and southern zones are also distinct in terms of the geographical and linguistic origins of their fishing communities. This factor has a role in limiting availability of and access to livelihood resources, and in making people food insecure and vulnerable to trends, seasonality and shocks.

Telugu fishers of the southern zone (Nolias). The southern zone is dominated by Telugu fishers, who can be further differentiated into permanent residents and migrant settlers. Permanent residents – called Nolias – are primarily located in Ganjam and the southern parts of Puri (particularly in the Chilika belt). Alhough many people – including some Nolias themselves – claim that they migrated from Andhra Pradesh in the distant past, there is no record to indicate when this may have occurred. There appears to have been a Telugu-speaking fishing community in the coastal area of Ganjam as early as 1838 (Ramaswamy, 1838, reprint 1992), and their widely dispersed settlement in Ganjam district is clearly evident at least since 1901 (Rice, 1901, reprint 2001; Thurston, 1909: vol. VII, reprint 2001).

The existence of a sizeable community of Telugu-speaking people in Ganjam district and the fact that this area was ruled by several kings of Telugu origin even before the Muslim era in Orissa indicate with certainty that the Nolias are endemic to the area. Before 1936, Ganjam district extended from Khallikot to Visakhapatnam and formed the northern boundary of the Madras Presidency (Kutty, undated). Thus the characterization of the Telugu-speaking people of Ganjam as settlers from Andhra Pradesh is false. Although they do have marital, social and economic relations and maintain regular interactions with their counterparts in Andhra Pradesh, they are as firmly grounded in Orissa as any Oriya community.

Telugu/Andhra fishers of the central zone. The migrant Telugu/Andhra communities are to be found almost entirely in the central zone. There are two categories within the migrant communities: permanent settlers and temporary migrants. The permanent settlers began appearing in the Puri area from Andhra Pradesh as early as the 1940s and 1950s, and the process continued right up to the 1980s (Schömbucher, 1986: 249;

Tietze, 1985: 59–60). These fishers are considered the most enterprising sea-fishers in the entire upper eastern coast of India. Some fishers maintain social, material and marital relations with their villages in Andhra Pradesh, an aspect that occasionally causes them to be viewed with suspicion.

Bengali and Bangladeshi settlers of the northern/central zone. The northern zone is mostly inhabited by Bengali fishers, who were settlers from former East Bengal and from West Bengal beginning in the middle of the twentieth century (Tietze, 1985: 63). Kalavathy, in Tietze (1985: 59), states that while the tradition of sea fishing in the southern districts is as old as that in Andhra Pradesh and Tamil Nadu, it started much later in the northern zone, stimulated by an increasing demand for marine fish from other Indian states and cities, and by export prospects for shrimp. The fishing systems adopted in the two zones are also reflected in the structures and processes prevailing within the communities themselves (and vice versa). At the time of the 1971 war of independence in Bangladesh, a large number of migrants entered the northern parts of Orissa and began fishing in estuarine, riverine and marine waters.

Significance of being a permanent outsider. 'Perpetual outsider' status is reflected in fishers being generally overlooked in development programmes. Their access to health care, education, economic support and social recognition is severely curtailed. They often travel long distances to receive medical treatment, even for minor problems. If more people die in these communities than elsewhere, it is not because they are more easily prone to serious ailments, but because even minor disorders can become fatal by the time medical assistance is secured. These communities play no role in the political processes determining their lives, have little interaction with administrative structures and are wary of the police and other 'support' structures because of the harassment, discrimination and apathy they frequently face at their hands.

Their land rights and, more important for a fishing community, customary use rights to fishing areas are ill-defined, and their ability to take recourse to legal measures is very limited. Kutty (undated) reports that the Nolias' illiteracy and dominance by the Oriya fishing castes have allowed the more powerful Khandayats to encroach upon their lands and obtain *pattas* (legal documents) of ownership. The result is that a majority of Nolias, although they have been residing in the area for generations, do not possess *pattas* and are considered encroachers. Fish traders complained that their outsider status, coupled with their limited ability to speak the local language, prevented them from demanding fair prices for their produce or fair wages for their labour. In villages such as Balianla, people are denied ownership rights to homestead land in spite of having lived in the area for well over half a century, and they are forced to let this land be used as common pasture for neighbouring agricultural villages. They also lack customary use rights to creeks and Chilika Lake, despite having fished in those waters for generations.

In Ganjam and Puri districts, many fishers – particularly women – speak a mixture of Oriya and Telugu, which is intelligible only to their own kin. Their inability to communicate properly in Oriya is a serious shortcoming in their dealings with the outer world. Widespread illiteracy, inaccessible and inhospitable living conditions, early marriages and child bearing, large families, hard work and poor earnings ensure that they continue to remain marginalized and viewed with suspicion and hostility by others. In return, they too are wary of others.

The Andhra fishers of the central zone are firmly established in their adopted state. However, their legal foundations are still shaky, as can be seen from the fact that in many areas, they do not have ownership rights to their homestead land. In Puri, Konark and Paradeep – three of the largest settlements of Telugu fishers in the zone – fishers constantly face the threat of relocation for tourism and other purposes.

The northern zone has sizeable numbers of Bangladeshi settlers as well as Bengali fishers, who, despite having been resident in the area for well over 30 years, continue to be largely ignored and marginalized in development and policy processes. The super cyclone of 1999 demonstrated how vulnerable and marginalized these fishing communities are to natural disasters, as well as in terms of obtaining relief in the post-disaster period. Because information about these people is of very poor quality, it is not even known how many people died in the cyclone. The lack of any material, social or economic links to their native places – unlike the Andhra/Telugu fishers – makes their lot much worse.

Caste

Tietze discusses the links between caste, social structure, fishing systems and outlook of the people. Caste plays a somewhat smaller role in determining poverty and vulnerability in Orissa, because the diverse geographical and linguistic origins of fishers and the relatively homogeneous (single-caste) groupings that exist in the villages ensure that caste distinctions are secondary in the larger pattern of things.

Fishing is almost entirely confined to traditional Hindu castes in Orissa (Kalavathy, in Tietze, 1985: 73), although there is evidence that Muslims take part in fishing and fish processing activities in parts of Balasore district in and around the Balaramgadi fishing area. There is an increasing trend among the fishing communities in the southern zone to convert to Christianity (Ch. Satyam, Pentakota-Puri, personal communication, 2003), which may also be related to the migrant experience of fishers. In most fishing villages in Ganjam district, a sizeable number have recently converted.

In the southern districts, a particular caste generally dominates a fishing hamlet. In the northern districts, this is not the case, because various non-traditional castes are also involved in marine fishing, and fishers' settlements are frequently part of larger agricultural villages (BOBP, 1984a: 8).

The Telugu fisherfolk in the southern zone belong to two castes – Jalaris and Vadabalijas. The Oriya fishers in the southern zone belong to inland fishing castes. Khandars, Kevtos, Khandayats are some of the fishing castes involved in fishing (Kutty, undated), although only secondarily in marine fishing.

In the central zone, Oriya fishing castes – Gokhas, Kaibartas and some agriculturalist castes – practice marine fishing, albeit in a few pockets of Ganjam and Puri districts. For the most part, members of these castes are confined to beach-seine operations or depend on a river mouth to launch their boats (Kalavathy, in Tietze, 1985: 61). In the central zone, where many important rivers enter the Bay of Bengal, many Oriya fishing castes habitually fish in rivers and estuaries as well as in the sea.

In the northern zone, numerous castes have taken to sea fishing. Those who were originally practising estuarine and inland fishing were the first to move into marine fishing (Tietze, 1985: 62). Later, members from other castes with traditional occupations such as agriculture and artisanal work followed. Traditional Oriya/Bengali riverine and estuarine fishing castes of North Orissa are Kaibarta, Gokha and Rajbansi, while the non-traditional castes that entered fishing later include Harayans, Khandayat, Radhi, Teli, Ganda, Barik and Kumar.

Kaibartas are the most dominant Oriya fishing caste, distinct from the Bengali Kaibartas (Kalavathy, in Tietze, 1985: 63). Khandayats are the largest non-traditional Oriya fishing caste in the state; they entered sea fishing mainly by investing surplus money from agriculture in fishing boats and nets. The predominantly agricultural background of these communities is reflected in their settlements, which are generally surrounded by a rich vegetation of various types of fruit trees, bamboo groves, palm trees, vegetable gardens and fish ponds, preferably beside a river (Tietze, 1985: 67).

Significance of caste to fishing communities. For the Telugu fishers of the central and southern zones, caste has traditionally signified an important binding force, largely because of the strong correlation that existed between the fishing activity and caste codes (Tietze, 1985). Within each regional grouping, it was found that there was a strong cohesion and organization. This was particularly evident in places such as Pentakota, where some of the community-based systems that had vanished in their land of origin – Andhra Pradesh – were revived, albeit in a different form. The vulnerability inherent in any migrant community could explain the strong bonds that existed within the community.

For fishers, caste created a sort of protection of livelihoods by barring outsiders from entering particular occupations (Gadgil and Guha, 1992). In more recent times, though, caste has also been a barrier to diversification. When women in the fishing villages of Ganjam were forced to seek employment in non-fishing-related occupations, there was much opposition from within the villages on caste grounds. It was only when things came to a critical pass, where moving out was the only way to make ends meet in a fishing household, that the women managed to obtain grudging consent to work elsewhere.

Even today, in several villages, men profess allegiance to their caste-ordained professions and find it beneath their dignity to take up alternative employment. Although this scheme of things is changing rapidly in areas such as Puri, where men have now begun to work as daily wage labourers in cashew-nut plantations, the excuse still enables men in many villages to escape from work altogether and resort to gambling and alcohol, while their women work to provide for them.

Caste also becomes important in helping fishers receive development assistance under various positive discrimination policies and programmes set up by the Government. The heterogeneity of background makes some fishers in the state – such as Nolias and Bengalis – fall into the 'backward classes', and others – the Oriya fishing groups such as Kevuta, Kaibarta and Tiara – into the scheduled castes. Being recognized as either entitles a household or an individual to social support mechanisms such as reservations in education and employment. The importance of such policies to the fishing communities has been recognized only recently, with increasing literacy and diversification.

Caste can also play an alienating role. The bicycle fish vendors that visit the landing centres belong to agrarian communities that consider fishing and fish trade as lowly occupations. Consequently, fish traders are looked on with disfavour even within their own caste groups. On the other hand, the marine fishing communities that supply their fish look upon them as outsiders. Many services that a trader from within the fishing community obtains – such as short-term credit and discounts – are generally not available to these traders. At another level, their legal status as fishers is perpetually in doubt, and they cannot always obtain state benefits earmarked for fishing communities.

Gender roles

There is a clear division of labour between men and women in the fishing sector in the southern zone. Men are generally involved in fishing and until recently handed the fish over to their wives for sale. The fact that the men spent most part of their working time at sea required that women took on economic as well as managerial roles. In such circumstances, women managed the household – processing fish, carrying them to the markets for sale, managing the finances and procuring daily necessities such as firewood, water and foodstuffs (Bavinck, 2001; BOBP, 1982). Schömbucher (1986) notes, "These two complementary spheres in the economic organization (production versus trading) have led to a high degree of economic independence among women."

This independence also accounts for the relatively high number of matrifocal families in fishing communities.

Thus in the southern zone, women dominate fish processing and trading activities, while in the north, women do not take an active part in trading or processing (Kalavathy, 1997: 24).

Studies in fishing villages indicate that for most single-woman-headed households, fish processing and trade are the only sources of livelihood. Any changes in the sector can affect them very negatively. Having no direct role in production systems, women have to depend on men for the fish to process and trade. With fish being sold off at the point of landing to new categories of traders – commission agents, financier-traders and exporters – fishers for their part no longer need to channel their fish through the women. Fish auctions are conducted on a ready-cash basis, which again leads to the marginalization of women, because the fish is inevitably sold to a trader. Fishers, however, are left with very little surplus for household needs after meeting their mounting investment expenses – e.g. for engine repairs, replenishment of nets, repair of boats, advances to crew, or costs of fuel and ice.

In the new system, then, women tend to be squeezed out of the markets. On the one hand, fishers target only the more expensive varieties, thereby reducing supply. On the other, the increased competition for many types of fish from traders engaged in exports or shipping to distant markets makes the fish too expensive for women processors to buy.

For households that have an earning man in the family, the returns from the sale of fresh fish would have amply compensated them for the loss of the processing income (although in social terms, it is still at the cost of the women). But for single-woman-headed households (which constitute up to a fifth of the total households in a fishing village), this means a serious loss. In many cases, even in households where men are titular heads, women tend to be the de facto managers of the household economy, because they contribute more, or at least more consistently throughout the year, to the family pot. However, their contributions remain hidden because their roles receive less recognition than they deserve. Even within households with earning men members, the 'masculinization' of the fish trade has meant a significant loss in social terms for women, at both the household and community level. From being the managers of the family purse, women have been reduced to depending on their husbands for even the most basic needs.

BOX 11

Transformation of role of women in fishing

The role of women in fishing activities in Orissa's southern zone has been transformed in three stages. The first stage is characterized by their active involvement in the post-harvest disposal of catches and their important role in the economic (and consequently social) organization of the family and the community.

The second stage is characterized by the women's marginalization from fishing-related activities as trading became a male-dominated activity with the emergence of distant market trade.

The third stage is characterized by declining fish catches, forcing men to turn to women to support the family's subsistence needs. Women once again play an important economic role in the family, but their traditional activities have undergone a radical change. Whereas the earlier period of dominance was characterized by women 'sharing' in the economic activities with their men, now they have to bear the burden of single-handedly supporting their families for extended periods.

Simultaneously and paradoxically, there is also an increasing involvement of women in 'productive' activities. With reduced earnings from fishing and declining opportunities for men in the sector, more women are actively involved in seeking employment in other sectors (Box 11). In Nolianuagaon, fishers calculated that nearly 50 percent of the household income in a large majority of households comes from women's earnings from agriculture, port labour, the hotel industry, domestic labour and construction or plantation work. Women who had never been wage earners in the past have now been forced to seek a livelihood and provide for their family's needs for at least part of the year. Conditions are thus worsening for women overall, with little to choose between women who have lost their livelihoods and are forced to depend on their husband's earnings for subsistence and women who are forced to find work to feed their families, including their husbands.

One interesting feature determining a family's poverty, as identified by fishers in some villages, is the number of girl children a family has. Because a girl can be married only after paying a sizable dowry, she is regarded as a liability. Even families with substantial physical assets are judged for their creditworthiness on the number of girl children they have. For a poor household with one or two girl children, the biggest problem is to get them married, and in a culture where the failure to be married at the appropriate time invites social opprobrium and ridicule, this is indeed a big burden. Several households manage to get their daughters married only after selling off significant portions of their physical assets, including boats and houses.

Single-woman-headed households have a distinct place in the criteria for determining poverty, as they are considered to be invariably the poorest. One of the key characteristics of migrant communities is the widespread existence of bigamy or polygamy. It is said that when a man moves into a new location in search of work (say from West Bengal to Balasore district in Orissa), leaving behind a wife and family, one of his strategies for finding acceptance in the new milieu is to marry a local girl. This has serious consequences for one of the two spouses, because of the low status and social insecurity that deserted women suffer in the society. In the southern zone, community councils insist on a man 'legally' divorcing a woman (after paying some compensation) before marrying another, and this is said to afford a modicum of protection to the woman. Remarriage is permitted for young, childless women, but for older women with one or more children, divorce can mean a considerable loss of security.

Under its pension programme for widows, the Government grants a monthly pension of Rs75 (US$1.5) to a woman when the earning head of the household dies. Many women receive this pension, but they complain that it is far too low to be of any real help.

Age

While initiation into fishing takes place at an early age – as young as 8 years old– it is from about age 12 that a boy can be considered an active fisher. By age 50 or thereabouts, fishers are either ready or forced to retire because of the strenuous nature of the occupation. The age range of 12-55 years can thus be considered to be the range for active fishing. Post-harvest operations also require skills, dexterity, physical strength, and endurance to work for long stretches of time; hence, people between 18 and 50 years of age dominate this category as well.

The 'retired' fishworker of 50, who has few assets and no one to take care of him/her is often the worst affected by the globalizing economy. Increased longevity, nuclearization of families, reduction of incomes, disintegration of family-owned fishing enterprises and marginalization of traditional knowledge and skills in the face of modernization have been cited as some of the reasons for the increasing number of destitute old people. Many of them turn to begging or depend on charity to survive. Some pensions are made available to poor and destitute old people, but they do not

reach all eligible candidates and tend to be too limited in amount and scope to be of any real benefit to the pensioners. There are plans to increase the pension amount to Rs100, and to streamline the disbursal mechanisms.

Social expenditure

Social expenditures include expenses for weddings and funerals, festivals and other religious events. Wedding expenses include the dowry payment as well as the amount spent on the wedding itself. The tradition of the dowry is not indigenous to fishing communities such as the Vadabalija. In fact, a system called *oli*, or bride price, was in vogue in this community, and traces of it can still be seen in some parts of coastal Andhra Pradesh. The dowry system was acquired by the Vadabalijas from upper Hindu castes in the last half century and the problem has assumed gigantic proportions over time.

Weddings in poor families are conducted rather conservatively. But in the middle to upper strata of the society, it is expected that the bride's father spend considerable amounts on the wedding, and an inability to do so diminishes his status. To keep up their social standing, families are forced to borrow extravagantly. Naturally, as mentioned, a girl child is looked upon as a big liability by fishers, and in wealth/poverty ranking exercises, one of the key criteria is the number of girl children in a family.

For village festivals that have high costs, the caste panchayat requires all boats to donate their returns from fishing during a set period to the village fund. If the collections are inadequate, either more fishing trips are undertaken or a fixed sum is levied on each household. Many observers comment that fishers seem willing to pay significant sums of money for festivals, but are not so generous when it comes to spending for the setting up – or even maintenance – of sanitation facilities, schools or fishing infrastructure.

Patronage relationships

Patronage plays a significant role in a fisher's ability to access support from development agencies. For government personnel, village elders are the first point of contact, both for operational as well as protocol reasons. The elders, although they do not always have a statutory role in the village, decide who should receive support. The selection of beneficiaries must be *seen* to have been achieved by consensus. Such consensus is usually easy to obtain when village leaders decide matters, as their authority is usually accepted. Moreover, ignoring the advice of the elders could have negative consequences not only for the programme, but also for programme officers.

Two important considerations apply here. One, elders prefer to help their own and, two, the elders, being the elites of the village, will be guided by their own perceptions of equity, which may not coincide with a strict definition of the term. The selection of beneficiaries thus may often depend on the potential services – political, economic or social – that beneficiaries can provide to their mentors.

The presence of more than one elder from different factions within the same village complicates matters, especially when each insists on all benefits going to members of his faction.

Even NGO programmes have to depend on influential people in the villages. In the initial stages of the NGO intervention this is a necessity, and in later stages it becomes the practice, because going against the grain will upset relationships that have been carefully forged in the village. Many community-based groups thus come to be guided by one or two active and articulate people, while the others simply acquiesce in the decisions. The elites in the groups can, and do, veto the entry of some people into new programmes based on differences in their economic, social, caste or religious backgrounds, and the development agency has to accept these sanctions. In emergency situations, as in the aftermath of the cyclone of 1999, both governments and

NGOs are forced to forge quick links with villages to expedite processes of relief and rehabilitation, and this is known to reinforce existing power structures or spawn new centres of power.

'Incentives'

Of all the processes that fishers are subject to, the one that involves giving 'incentives' to various development agents and their intermediaries, in the form of commissions and bribes, is the most pernicious. Fishers' ability to receive support under a development programme is subject to their ability to pay something to the concerned officers. Similarly, they can evade loan repayments by bribing the officer in charge of recovery. The inability of the Government to provide travel and incidental expenses to the officers, let alone an incentive for good recoveries, contributes to this process.

To obtain certificates of residence, birth and death, property ownership, marriage and a host of other official documents, fishers must pay a price in bribes. To receive a bank loan under a development project, a beneficiary ends up paying a sizeable part of the sum received to various intermediaries. It is widely believed – often justifiably – that development credit need not be repaid, a belief strongly encouraged by the functionaries of the lending agencies themselves.

To recover the insurance due to a dead fisher, his family pays a bribe. To make a normal death appear an accidental death at sea in order to receive the insurance money, a bribe is paid. To be treated at the government hospital, a bribe is also paid. When caught in violation of a ban or a regulation, the fisher pays a sum of money and 'escapes' punishment. When people dealing in illicit liquor are caught in the village, the brewer/dealer escapes by paying some money. There are instances when laws – for instance, concerning the legality of fishing in a supposedly banned fishing zone in the Bhitar Kanika area – are interpreted differently at different times depending on the amount of money that changes hands.

Such widespread corruption leads to utter cynicism about the whole system among fishers, who have come to believe that anything is possible for those who can bribe generously. It is not surprising, then, that several enterprising fishers have become masters of the game themselves and have begun to extract their pound of flesh both from the system and from the large majority of their hapless fishing brethren.

Excessive dependence on government support

The second half of the twentieth century was a period of increasing interaction between fishers and the rest of society, on the one hand, and between fishers and the Government, on the other. Their relative isolation and poverty, coupled with the push to enhance production to meet growing market demand, brought them generous, even lavish, government support in the initial stages. This gave rise to a widespread perception among fishers that the Government was always there to give and did not take anything in return (fishing was exempted from taxation). This idea gained currency when it was found that governmental agencies, including banks, paid little attention to recovering the loans or to assessing the performance of the assets they provided. Lax implementation allowed some fishers to corner large chunks of the assistance provided, which in turn spurred the avarice of others. In times of cyclones and other natural disasters, the support provided to fishing communities was so unstinting that it gave rise to a feeling among some sectors of fishers that cyclones were not always bad news.

Over time, their dependence on and expectations of the Government have grown. This dependence is prevalent in almost all villages. Increasingly, people began leaving even decisions concerning their own lives and livelihoods to the Government. In the study, questions about the need for diversification in the face of declining livelihoods yielded poor responses. Fishers had either not given any thought to these critical issues or they expected the Government to address the problem on their behalf. Their

expectations of the Government and NGOs have reached a level that is not only impossible to fulfil, but also demeaning to the once proud and independent community of fishers.

One striking feature observed in many villages is the almost complete withdrawal of a large number of people – particularly among the very poor and destitute – from existing structures and institutions. They were oblivious of the ongoing efforts – developmental or otherwise – taking place in the area. Even their habitations are often nearly invisible, and it appears as though they have opted out of the system as a survival strategy.

CHAPTER 5

Features of poverty, food insecurity and vulnerability in coastal fishing communities of Orissa

INDICATORS OF POVERTY, FOOD INSECURITY AND VULNERABILITY

Several structural and systemic factors responsible for unsustainable and poor livelihoods in the fishing sector were documented in Chapter 4. They show that the key issue concerning a majority of the people in fishing communities is that of unviable and progressively unsustainable livelihoods, as reflected in and caused by the following factors:

- subsistence-based occupations, subject to fluctuations and increasing competition;
- dwindling access to and availability of natural assets;
- overcapitalized methods of exploitation that displace manual labour and are inimical to sustainable exploitation of the natural resource base;
- little or no surplus, low creditworthiness and weakening of social support networks;
- poor ability to cope with and recover from the combined impact of trends, shocks and seasonality;
- poor knowledge base, low literacy, skills, capacities and opportunities to maintain, enhance or diversify current livelihood strategies; and
- commodity-oriented, as opposed to people-oriented, development and conservation programmes.

The indicators of livelihood outcomes in terms of poverty, vulnerability and food insecurity can be derived as follows, although more often than not, the conditions of poverty in a household may be a combination of more than one factor:

- those derived from factors causing a change in livelihood conditions: (i) structural changes – lack of fishing boats and other tools (a condition of poverty); increased necessity for investment in fishing (a change in the level of poverty); (ii) systemic changes – single-woman-headed households are precluded from receiving some services at the community level (a condition); and traditional fish processors lose out in the competition for fish (a change). Factors causing a change could be external to the community – for instance, regular exposure to the adverse impacts of mechanized trawling fleets, or industrial or large-scale fish kills due to agricultural pollution;
- those derived from the condition/change itself: amount of surplus generated from fishing or fish trade; distances travelled for fishing or trade; varieties of fish caught and changes in processing/preserving/marketing patterns; periodicity and recurrence of indebtedness for productive purposes;
- those derived from the consequences of a condition/change – i.e. quality of life indicators, such as housing, availability of and access to water, health care, education, insurance, etc.; and
- those derived from the nature/effectiveness of fishers' responses – for instance, fishers who turn to illegal shrimp-seed collection as a last resort are obviously

a poor and vulnerable group; households that seasonally depend on credit for subsistence needs are poor.

Different levels of deprivation exist within each of these indicators, and these need to be defined clearly to 'locate' a group of people in the well-off, poor, very poor or destitute categories. It has to be borne in mind that the list is by no means comprehensive.

KEY ISSUES OF POVERTY AND VULNERABILITY ARISING FROM LIVELIHOOD ANALYSIS

1. ***Dependence on open-access or common property resources (CPRs)***. The household depends mainly upon open-access or CPRs *using fairly simple means of production or working for shares/wages* for its primary livelihood. Open-access or CPRs can provide products (fish) for sale, raw material needed for fish processing or basket making, and for household needs (firewood, construction timber, etc.).
2. ***Contested access/use rights***. Traditional dependence on open-access or CPRs can be affected as a result of contested access/use rights or ownership. This could be caused by: competition from modern technologies such as trawlers and aquaculture; privatization of commons for conversion to agriculture, aquaculture, salt pans, buildings and industries; restrictions on usage of CPRs through closure of access regularly or seasonally for defence, conservation, tourism and other purposes. Such changes have several outcomes. They could lead to increased conflicts between traditional and modern users of the resources; they require fishers to obtain permission to use resources that were previously common property; some fishers continue with clandestine activities by paying occasional fines or bribes.
3. ***Poor asset base***. Ownership of assets gives fishers the right to determine how to make use of them and also provides a foil against future vulnerability. It also provides de facto assurance of tenure. Lack of a boat could effectively mean lack of access to fishing grounds, despite the open-access nature of the area. However, assurance of tenure is a dynamic and relative process. Lack of investment in modernizing traditional systems or competition from more advanced technologies could lead to the loss of assurance of tenure. Wage- or share-earning fishworkers in production, fish processing and trade-related activities and owners of non-motorized fishing craft suffer the effects of a poor asset base.
4. ***Simple, low-cost and indigenous productive assets***. Artisanal crafts and gear – such as wooden catamarans, fish processing equipment, bamboo baskets, bullock carts and handmade nets; cement salting vats made by the processors in Puri and Ganjam districts; earthenware pots made in villages such as Balipantal – cater to local/traditional markets. They face competition from more efficient technologies (insulated trucks, mechanized boats, freezing plants) and market forces (export trade, distant domestic trade).
5. ***Uncertain livelihoods***. Fishing is characterized by long and difficult physical labour, uncertainty of catch, high risk (vulnerability to disasters) and lack of insurance. All *active* seafaring fishers (owners of non-motorized artisanal craft and all wage/share earning crew members) are subject to these characteristics. Other occupational groups affected by uncertain livelihoods include fish processors and petty traders, who have to compete with larger traders for the landed fish, spend extended periods in unhygienic and unhealthy processing areas, brave unpredictable weather and market conditions, and face frequent risks associated with losses.
6. ***Erratic income***. Crew shares and profits from fish trade suffer from low and fluctuating incomes that are barely sufficient to meet subsistence needs year round. This is reflected in poor savings among artisanal fishers, whose erratic incomes also create a mindset that is not conducive to saving. Another important indicator is the creditworthiness of a household – the more credit it can generate in the market,

the better and more stable its income. A third important indicator would be the seasonal dependence of a family on credit for basic consumption needs, as a result of poor surpluses generated from the usual livelihood activities.

7. ***Low income***. The single most important indicator that could characterize people as 'well off' or 'poor' is the income they earn from their usual activities. Unfortunately, it is very difficult to establish the incomes of fishing households, because they are characterized by seasonal changes and erratic and uncertain wages. Fluctuations in markets, changes in credit linkages, terms of trade and sharing patterns all create conditions that make it difficult to establish low income as an indicator of poverty. If, however, the household income could be derived using realistic means, all families earning less than Rs1 000 per month (approximately US$22) can be categorized as 'poor'.
8. ***Distress sale***. For most fishworkers involved in production and trading operations that require investments, the returns from one cycle of operations finance the next. This means that they often have no option but to sell their product at whatever price is offered, rather than waiting for a better opportunity.
9. ***Seasonal unemployment***. Fishing activities are affected by seasonal lows. The seasonal mortgaging of productive or fixed assets such as houses to meet subsistence needs is an indicator of the intensity of the impact of seasonal unemployment. Seasonal deprivation is an important indicator. This is reflected in poor intake of food, poor health care, increased alcoholism, gambling and fights among men, dependence on credit at exorbitant rates of visible or hidden interest and reduced attention to vulnerable sectors such as children and the elderly. The number of boats lying idle on the beach is also an indicator of seasonal unemployment, as is the seasonal dependence on banned or potentially harmful activities.
10. ***Unsustainable livelihood activities***. All villages report regular or seasonal dependence on low-paying or destructive activities to meet subsistence needs. People involved in illegal activities, such as shrimp-seed collection, mangrove felling and fishing during ban periods, generally belong to the poorest sectors of society. Similarly, activities such as petty fish trade, shell collection, lime-making, pulling beach seines, fishing in areas that are frequently polluted, small-scale aquaculture and even small-scale fish processing are becoming increasingly unsustainable, and people involved in these activities can be categorized as vulnerable.
11. ***Migration***. Migration or diversification of occupations on a seasonal or regular basis to meet basic subsistence needs is another coping mechanism. In entering non-traditional manual occupations, fishers often have to contend with competition from the existing work force. Seasonal migration of men (and sometimes women) often leaves the children and old people left behind more vulnerable. Living conditions at the new sites are often pathetic and indicate that migration was undertaken out of necessity rather than opportunity. People suffer frequently from injuries or health problems as a result of their involvement in activities in which they are not skilled. Migrant workers also have to contend with partial payment (or sometimes non-payment) of wages.
12. ***Inability to diversify or migrate***. Because migration or diversification is a necessity for the poor, the inability to do so would indicate an even more serious deprivation. Many single-woman-headed households fail to migrate to good fishing areas during lean periods in their villages for economic and social reasons. People unable to diversify into other occupations because of competition, lack of opportunity and skills, traders' insistence or physical or social disability can all be considered to belong to poor sectors.
13. ***Need for multiple earners in the family***. Basic subsistence needs of a family are met by more than one member in the family taking up regular or seasonal manual labour. The dependence on credit and the failure to meet subsistence needs

increases when only one member finds work on a given day, according to reports from many villages.

14. ***Burden on women to provide for the family***. In households headed by single women, women's earnings through manual wage labour meet the family's needs regularly or seasonally. Pregnant women often continue to perform manual labour throughout their pregnancy. Single-woman-headed families are among the most burdened families in fishing villages. Their access to fish declines because of competition and low investment capacity. This is particularly so during lean periods. In many cases, even when a man is the titular head of the household, women are the de facto managers of the household economy, because they contribute more to the family pot, or at least more consistently throughout the year.
15. ***Indebtedness***. A boat owner indebted to a trader is vulnerable, because he is often forced to sell his catch at the rate demanded by the trader. An important indicator of poverty is the source of credit. fishers whose only source of loans is friends, neighbours and relatives are not sufficiently creditworthy in terms of assets or income to obtain loans from professional moneylenders and fish traders. Having an individual bank account is a sure sign of affluence, although not having an account is not necessarily a sign of poverty.
16. ***Poor insurance and safety nets***. Children, the aged and/or the infirm working for subsistence often lack adequate safety nets. Examples of these kinds of poor include: old or physically disabled fishers earning a living by net mending; children that forage fish from the beach and sell them for a small income or collect shrimp seed alongside their parents; physically handicapped or pregnant women involved in hard manual labour. Old people and widows that live on their own, with or without dependents, but with no assured sources of income, are poor. Also categorized as poor are families of fishers killed at sea, or those who lost members during a cyclone but failed to obtain any rehabilitation support.
17. ***Destitution***. Women who exchange sweetmeats or roots for fish, or simply collect them as charity and sell them in return for their necessities may fall into this category. People whose food, shelter and/or clothing needs are dependent on others' charity exist in all fishing villages. While some of them may have lived in absolute poverty throughout their lives, many are erstwhile fishworkers, who have slid down the scale because of old age, shocks (loss of a boat at sea, cyclones, death of the main earning member, market losses, physical disability or ill health, etc.), increased loan burdens (as a result of bad investments, daughter's wedding, seasonal consumption needs, etc.) and loss of livelihood (because of competition).
18. ***Low capacity for investment***. Those who lack the capacity to invest continue with simple labour-oriented methods despite the existence of more efficient means of production and processing. This is also reflected in the fisher's inability to undertake repairs/maintenance to productive assets, leaving boats or equipment lying idle on the beaches or in the village for extended periods. Using inappropriate or improper means of fish handling and processing methods in spite of the existence of alternatives is also a direct outcome of a low capacity to invest.
19. ***Ownership of homestead land***. Unclear terms of ownership, or a complete lack of ownership of homestead land characterizes the poor. The poor live on the beaches or other less preferred areas and do not own the land. When the houses are washed away in a cyclone or a flood, the house owners are not eligible to receive compensation. Lack of ownership also means that the poor can be evicted from their place of residence whenever the Government decides to change land use.
20. ***Lack of secure housing***. People falling in this category include those living on others' verandas or in makeshift tents on the beach, or sharing a room with other families. Security of housing is related to ownership of homestead land, ability to build a permanent house (with or without government support) and equipping it with

basic amenities (electricity, water, latrines). In most villages, people without access to secure housing constituted a sizeable proportion of the total households.

21. ***Poor location of houses***. Houses located in potentially vulnerable areas – low-lying, difficult to access, prone to erosion and/or unhygienic – are the most easily accessible locations for the poor, because such locations are not preferred by anybody who can afford to avoid them.
22. ***Cooking in the open***. Lack of space inside the house forces many people to cook in the open or under the awning of the hut during the rainy season. Using firewood necessitates cooking in the open, as cooking inside would be a fire hazard.
23. ***Firewood for cooking***. Differences in the quality of fuel used for cooking – firewood, kerosene, charcoal or gas – indicate the economic level of a family.
24. ***Lack of amenities***. Poor access to electricity, private or public latrines, transport systems, community halls and cyclone shelters applies to all households in several villages in Orissa, irrespective of the social and economic status of a family. Nevertheless, it is important as a feature of absolute poverty.
25. ***Poor availability of water***. Access to water in terms of source, quality and distance indicates poverty. Poor people get water from open sources (rivers, ponds, open wells) or community bore wells, or through conditional access to private bore wells. Travelling long distances for water is characteristic of many fishing households. The use of water for washing and bathing is not regular in several poor households, and the quality of water used is poor.
26. ***Poor access to water***. Availability of water can be restricted based on caste, residence in the village (outsiders not allowed to collect water), marital status (members of woman-headed households may collect water only after those of man-headed households), class (the elite sectors of the community take priority over the rest), place of residence in relation to the location of water source (people from a particular location cannot access water from another location).
27. ***Large family size***. Large families, including households with at least two couples, that have a low proportion of earning members to dependents fall in the poor category.
28. ***Low literacy***. Poor families are usually unable to send their children to schools, either because they cannot afford it, or because of their dependence on children's earnings. Idle children or child workers are indicators of this category.
29. ***Intrahousehold differences in food consumption***. Women, young girls and widows eating last in the family is an indicator for this category. Poverty can also be discerned in families where there are differences in food consumption between people of different age groups and sex, and where pregnant and lactating mothers don't obtain sufficient nutrition.
30. ***Food insecurity***. The prevalence of malnutrition and related diseases is an indicator of food insecurity. This is caused by the poor quality of food consumed, a low diversity of foodstuffs, seasonal deprivation and hunger, dependence on subsidized food supplies, disproportionately high expenditures on food needs (as a fraction of income), and procurement of food on a daily basis.
31. ***Poor health and health care***. A family's economic health can be damaged by the chronic ill health of the main wage earner, disproportionately high expenditures on health care for the family, and poor access to affordable and effective health care. Dependence on local healers and home remedies is an indicator of economic stress as a result of poor health or inadequate health care.
32. ***Vices***. The presence of habitual drunkards or gamblers in the family represents a drain on the family's resources.
33. ***Alienation***. Alienation occurs among families/individuals not affiliated to any group in the village or considered lowly due to their caste, class, occupation, gender, age, marital status, physical disabilities, religion, geographical origin, linguistic

affiliation, etc. Non-local origin of the household and/or lack of proficiency in the local language can be factors leading to alienation.

34. ***Women as a liability***. The number of girl children in a family can be taken as an indicator of economic insecurity or vulnerability.
35. ***Inaccessibility of institutional support***. Families unable to access development support because of high transaction costs, and those that have not received any benefits from government or other development institutions constitute this category.
36. ***Marginalization***. Marginalization occurs among people whose traditional livelihoods are threatened by competition from more efficient systems of production and trade. Traditional boat owners and processing systems, basket traders, salt makers, net weavers and menders, and fish cutters are the vulnerable population in this category.

Summary of indicators at the household level

The key issues were used to develop a set of indicators, which were then validated in 18 villages covering 108 households in all. Table 14 provides the list of indicators, means used to verify them at the household level and the number and percentage of households in the sample where the indicator was valid.

The importance of these indicators lies in the fact that they were identified and validated by the fishing communities that were the subjects of the research. They summarize the issues that fishers themselves consider important in determining their poverty. Consequently, while the need for further refinement is recognized, they

TABLE 14
Indicators to monitor changes in livelihoods of coastal fishers

Indicator	Means of verification	Percentage and numbers of households for which indicator is valid
Household depends mainly upon open access or CPRs *using fairly simple means of production or working for shares/wages* for primary livelihood.	Observation Livelihood profile of household Nature of primary and secondary livelihoods Means of extraction (level of technology employed) Source and nature of income (wages/shares/profits)	100% (108/108)
Traditional or customary access and use rights to natural resources and CPRs are contested or declining because of lack of formal recognition or assurance of tenure.	Trend analysis of use patterns of traditional resources on which fishers depended SWOT analysis of primary livelihoods Government notifications restricting/controlling access to certain areas/fishing grounds	94% (102/108)
Household lacks ownership of sufficient productive assets *to make living*.	Observation Daily/weekly income-expenses pattern (may be repeated at different periods of year)	72% (78/108)
When owned, productive assets are likely to be traditional, simple, low-cost and indigenous, catering to local/traditional markets and vulnerable to competition from new technology and market forces.	Observation Trend analysis of production, processing and marketing systems	100% (12/12)
Household earns insufficient or barely sufficient and erratic income from main livelihood activities.	Livelihood profile Daily/weekly income-expenses pattern at different times of year Information on daily wages Estimation of average daily surplus during previous week Number of days in last week when members of household did not earn or earned income not adequate to meet basic needs	100% (108/108)

Indicator	Means of verification	Percentage and numbers of households for which indicator is valid
Each cycle of operations – fishing, fish trade or fish processing – is dependent on returns from previous cycle.	Observation	94% (102/108)
Head of household is unemployed *for lack of opportunities to work* during some parts of year.	Observation Seasonal employment calendar	100% (108/108)
Family regularly depends on credit or mortgages assets (boat, processing equipment and house) for *consumption purposes* during some parts of year.	Daily/weekly income-expenditure patterns during lean periods, including contribution of credit/loan to meet food costs Information on assets mortgaged with moneylenders Outstanding loan with grocers Record of loans from SHG/moneylenders during last lean period	94% (102/108)[1]
Members of family cannot afford to obtain food during some parts of year or randomly throughout year.	Observation Number of instances household went without food or made do with insufficient food during past year/last lean season, validated against similar information obtained from other households in same socio-economic category	93% (100/108)
Members of family undertake seasonal geographical or occupational migration to meet subsistence needs.	Livelihood profile of household for one year Details of geographical/occupational migration undertaken by family members in past year	52% (56/108)[2]
Household's subsistence needs are met by more than one member in family working regularly or seasonally in *daily wage activities involving physical labour.*	Household livelihood profile: number of wage earners working in family; type of activities involved in; seasonal occupational profile Household income-expenditure pattern for past week	75% (81/108)
Household is managed by single woman, who is involved in small-scale enterprise (fish processing/trade) or wage-earning activities as primary occupation.	Observation Sources of income to family	18% (19/108)[3]
Women continue to work through period of pregnancy in manual labour operations.	Observation (if possible) Information on what woman did during last pregnancy	33% (36/108)
Household frequently undertakes activities such as shrimp-seed collection, mangrove felling, fishing during ban period to meet subsistence needs.	Observation Records of members of household paying fines or facing punishment for breaking law	80% (86/108)
Women, elderly, infirm or children work to meet subsistence needs seasonally or regularly.	Observation Family income and expenditure patterns	73% (79/108)
Household depends partly or wholly on charity or begging for consumption or trade purposes.	Observation	13% (14/108)
Some or all of productive assets of family are lying idle because of family's inability to undertake repairs or maintenance.	Observation	40% (12/30)
Family does not have clear ownership of homestead land.	Observation	38% (41/108)
Family resides in house located in vulnerable, unhygienic or inconvenient location.	Observation	70% (76/108)
Family resides in thatched hut/*kutcha*[4] house.	Observation	70% (76/108)[5]
Family does not have separate kitchen in house.	Observation	56% (61/108)
Cooking is done using firewood collected by members of family from mangroves or casuarina groves.	Observation	95% (103/108)
Household does not have access to electricity.	Observation	88% (95/108)
Household uses open areas as latrines.	Observation	98% (106/108)
Family members rarely or seldom go to watch films.	Information on last time family members went to see film	68% (74/108)

Indicator	Means of verification	Percentage and numbers of households for which indicator is valid
Family depends on water from open or common sources (bore wells), or on conditional access to private sources in neighbourhood.	Observation	96% (104/108)
Inability to send children to schools because of unaffordable costs, or because of dependence on children's earnings.	Observation	80% (86/108)
Women and girl children take their meals last, after everyone else in household.	Observation; family food consumption pattern	96% (104/108)[6]
Pregnant and lactating women, old people and children unable to receive adequate and nutritious diet.	Observation; family food consumption pattern	95% (103/108)
Family food basket comprises narrow range of cheap foodstuffs (rice, dhal, dried fish) most of year.	Observation	100% (108/108)
Rice gruel is main/only item consumed by family at least few times in year.	Observation; family food consumption at different periods in year	99% (107/108)
Household buys leftover vegetables and meat, frequently from petty traders selling cheaper foodstuffs.	Observation Source of procurement of foodstuffs in markets	99% (107/108)
Consumption of fish is confined to cheaper varieties or dried fish and to two or three times per week.	Observation	100% (108/108)
Family suffers from inadequate availability of food at least few times in year (eat fewer times, not eat at all, some household members go hungry or eat less than needed).	Observation Seasonality calendar for food consumption patterns over year	93% (100/108)
Family does not grow vegetables or keep livestock.	Observation	80% (86/108)
Family purchases most of food needs on daily basis.	Observation	75% (81/108)
Incidence of malnutrition-related diseases in family, particularly among children.	Observation Health records	50% (54/108)
Family regularly depends on PDS to meet food and fuel needs.	Observation PDS ration card usage	62% (67/108)
Family spends large proportion of earnings on food.	Daily/weekly income-expenditure pattern	96% (104/108)
Head of household, whose daily earnings are necessary for family to survive, suffers from frequent or long-lasting illnesses, or is drunkard	Observation Medical records	33% (36/108)
Family spends significant proportion of income on health care regularly.	Observation Medical records	71% (77/108)
Family depends on home remedies and local quacks for health care needs.	Observation	91% (98/108)
Family does not belong to any village group.	Household interviews Group records	32% (365/108)
Family members do not speak language of majority community, and are not confident about expressing themselves in that language.	Observation Household interviews	41% (44/108)
Household does not have savings.	Observation Household interviews	66% (72/108)
Family has a number of girl children.	Observation	50% (54/108)
Friends, relations and neighbours are only or more frequent lenders for subsistence needs.	Observation Household interviews	91% (98/108)

[1] The maximum exceptions (4) to this come from households in the 'destitute' category that are not regularly indebted because they cannot obtain any loans.

[2] The greatest number of people that do not undertake migration (19) come from the 'destitute' category, because they lack the skills, ability or capacity to move out.

[3] Some 18 percent of the households interviewed were headed by single women.

[4] *Kutcha* = makeshift or temporary (as opposed to *pukka* = permanent).

[5] Some people obtained permanent housing through government and NGO efforts.

[6] This applies equally to non-fishing and well-off households, with the difference that, in poor households, the quantity, quality and variety of food left for those who eat last is barely passable or inadequate.

provide, perhaps for the first time, a set of indicators that correspond closely to the actual experiences of fishers. The means of verification provided are merely indicative, because it is recognized that much simpler (or perhaps more rigorous) means of data collection may be available to different agencies. The emphasis has been on trying to make the process as simple as possible, while taking the household/community into confidence in collecting the data through the use of participatory tools and methodologies.

Some of the indicators – for example, dependence on open-access resources – are not specifically applicable to the poor alone. However, when taken in conjunction with a range of other features such as access to and availability of assets, levels of vulnerability and support obtained from policies and institutions, such indicators can constitute important determinants of poverty. Thus these indicators can be combined with other key variables to constitute composite indices of poverty and deprivation.

Obviously, poverty is an outcome of many factors, and deciding who is poor based upon any single or even a few indicators can be misleading. At the simplest level, the poorest can be categorized as people whose livelihoods reflect the widest number of negative indicators, while the more affluent have the fewest negative indicators. There are many intermediate levels between the poorest and the wealthy, which are determined by differences in the numbers of indicators examined. However, each indicator is multidimensional and subsumes differences in depth and severity. All indicators do not carry equal weight, hence a mere counting of numbers of indicators will not suffice to arrive at a final conclusion.

Factors that have an impact on the poor at the village/sector level

The following indicators were established at the village level. The figures in brackets indicate the percentage of villages for which the indicator is valid.

1. The village is physically cut off from the larger society: 44% (8 villages out of 18 studied).
2. Access to the village is difficult due to poor roads and transport systems: 50% (9/18).
3. Basic services such as health, education, food, disaster warnings and relief are not readily available within or close to the village: 61% (11/18).
4. It takes a long time for relief and rehabilitation to reach the village after a disaster: 78% (14/18).
5. Government functionaries posted to work in the village are frequently not available: 89% (16/18).
6. There is no NGO or grassroots group working in the village:[6] 55% (10/18).
7. The village does not receive a daily newspaper; there are no radios or televisions: 67% (12/18).
8. There is a large unemployed workforce of fishers in the village: 89% (16/18).
9. Fish catches in the area are characterized by a good percentage of juveniles: 100% (18/18).
10. Each boat carries a number of species-specific nets at any given time: 100% (18/18).
11. Some traditionally available fishes are no longer seen: 100% (18/18).
12. Motorized boats account for a major share of the catch: 67% (12/18).
13. The bulk of the fish catch goes for fresh fish trade and for chilling/freezing/export trade: 61% (11/18).
14. The boats remain on shore for extended periods of time: 83% (15/18).

[6] For wider validation, the villages were selected randomly and the criteria used for selecting villages for the first phase of the study were not applied.

TABLE 15
Example of a ranking exercise to determine the importance of each indicator

Indicator	Rank
Household depends mainly upon open-access or CPRs *using fairly simple means of production or working for shares/wages* for primary livelihood.	4
Traditional or customary access and use rights to natural resources and CPRs are contested or declining because of lack of formal recognition or assurance of tenure.	4
Household lacks ownership of productive assets sufficient *to make a living.*	5
When owned, productive assets tend to be traditional, simple, low-cost and indigenous, catering to local/ traditional markets and vulnerable to competition from new technology and market forces.	Not applicable
Household income from main livelihood activities is insufficient, barely sufficient or erratic.	5
Each cycle of operations – fishing, fish trade or fish processing – is dependent on returns from previous cycle.	4
Head of household is unemployed *for want of work opportunities* during some parts of year.	5
Family regularly depends on credit or mortgages assets for *consumption purposes* during some parts of year.	4
Members of family cannot obtain food during some parts of year or randomly throughout year.	5
Members of family undertake seasonal geographic or occupational migration to meet subsistence needs.	4
Household's subsistence needs are met by more than one family member working regularly or seasonally in *daily wage activities involving physical labour.*	3
Household is managed by single woman, who is involved in small-scale enterprise (fish processing/trade) or wage-earning activities as primary occupation.	5
Women continue to work through period of pregnancy in manual labour operations.	5
Household seasonally or regularly depends on illegal activities, such as shrimp-seed collection, mangrove felling or fishing during ban period, to meet subsistence needs.	5
Women, old or infirm people, or very young people in family work in order to meet subsistence needs.	5
Household depends partly or wholly on charity or begging.	5
Some or all of productive assets of family are lying idle because of family's inability to undertake repairs or maintenance.	3
Family does not have clear ownership of homestead land.	4
Family resides in house located in vulnerable, unhygienic or inconvenient location.	2
Family resides in thatched hut.	3
Family does not have separate kitchen.	1
Cooking is done using firewood collected by members of family from mangroves or casuarina groves.	1
Household does not have access to *own* electricity.	1
Household uses open areas as latrines.	1
Family members rarely or seldom go to watch films.	1
Family depends on water from open sources or communal sources (bore wells), or on conditional access to private sources in neighbourhood.	2
Family does not have assured access to water.	3
Quality of water obtained is poor.	4
Household is unable to send children to school because of costs, or because of dependence on children's earnings.	3
Women and girl children take their meals last, after everyone else in household.	4
Pregnant and lactating women, old people and children are unable to receive adequate and nutritious diets.	5
Family food basket consists of narrow range of cheap foodstuffs (rice, dhal or dried fish) for most of year.	2
Rice gruel is main or only item consumed by household at least few times per year.	5
Household buys leftover vegetables and meat, often from petty traders selling cheaper foodstuffs.	5
Consumption of fish is confined to cheaper varieties or dried fish, and to two or three times in week.	5
Family suffers from inadequacy of food at least few times in year (eating fewer times, not eating at all, some members going hungry or eating insufficient food).	5
Family does not grow vegetables or keep livestock.	4
Family purchases food needs on daily basis.	4
There is high incidence of malnutrition-related diseases in family, particularly among children.	5
Family regularly depends on PDS.	3
Family eats less fish, or eats cheaper or poorer quality fish than previously.	4
Family spends large proportion of earnings on food.	5
Head of household, who earns livelihood from wage labour, suffers from frequent or long-lasting illnesses, or is habitual drunkard.	5
Family regularly spends significant proportion of income on health care.	5
Family depends on home remedies and local quacks for health care needs.	2
Family does not belong to any village group.	2
Family members do not speak same language as majority community, and are not confident about expressing themselves in that language.	3
Household does not have any savings.	4
Family has a number of girl children.	5
Friends, relatives and neighbours are only or more frequent lenders to family for subsistence needs.	2
Composite rank of household.	181

15. A majority of boats are indebted to trader-financiers: 100% (18/18).
16. A large part of the income from fishing comes from species sent to distant/export markets: 100% (18/18).
17. Many artisanal fishing tools and pieces of equipment lie idle and unrepaired in the village: 72% (13/18).
18. Fishing operations are frequently affected by external factors – defence regulations, factory effluents and competition from trawlers: 94% (17/18).
19. Ownership of major productive assets is confined to a small minority of people in or outside the village: 83% (15/18).
20. Customary use rights to open water bodies or CPRs are contested by other users or by the Government: 94% (17/18).
21. Fishers constitute the minority in the village (by numbers, caste, cultural/geographic/linguistic differences, etc.): 33% (6/18).
22. The village receives poor and inadequate support (in terms of variety, number and quality of assets) from the state in comparison with a neighbouring, better-integrated village: 67% (12/18).
23. The state's support does not reach the intended beneficiaries in the village: 50% (9/18).
24. There is a constant outflow of people into non-traditional occupations: 72% (13/18).
25. The villagers have no secure ownership of their homestead land: 33% (6/18).
26. The village lies adjacent to a protected area or sensitive installation: 50% (9/18).
27. The villagers face threats of eviction or relocation: 17% (3/18).
28. The cyclone shelters in the village are insufficient in number and capacity: 78% (14/18).

Simple ranking exercise to determine levels of poverty in a fishing village[7]

Respondents were asked to attempt a quick ranking of the importance of each of the indicators in determining the poverty, vulnerability and food insecurity of a household, from 1 (insignificant) to 5 (extremely important). The exercise, somewhat experimental in nature, yielded a rough yardstick for weighting each indicator. Table 15 is an example of ranking for different indicators given by a household in the Puri district.

Through the ranking exercise, it was possible to develop a crude (because not all indicators carry the same weight), but somewhat detailed picture of the poverty levels of different households. Considering that there are about 50 indicators, the highest score in the ranking exercise could be 250 and the lowest 50 or less (because some indicators may not be applicable to a family). Households with high scores could be assumed to belong to the poorest groups, while those in the lower end would be relatively less poor. Thus it would be possible to 'locate' each household in the ranking matrix depending on its overall rank. Even when many households receive the same overall rank, this does not necessarily indicate that their features of poverty, food insecurity and vulnerability are the same, because the weighting they give to different indicators might vary. Thus this composite measure of poverty could help in developing a comprehensive picture of the depth and severity of poverty in coastal fishing communities. Moreover, it provides a good understanding of the key priority actions that the community considers important for the village as a whole or at the household level.

[7] It must be made clear that what is being presented here is an amateurish attempt at coming to grips with poverty in the coastal fishing communities, while acknowledging that it does not take into account a number of imponderables and caveats. This comes out of a need for a rough-and-dirty method of assessing poverty, in a location, that the study team, as active development professionals themselves, have often felt but were/are ill-equipped to address on their own.

It is possible, or may be necessary, to bring down the number of indicators to 20–30 in all, so that the ranking exercise becomes more focused and confined to objectively verifiable indicators. It is also necessary to validate the list of indicators at the village level right at the beginning, in order to add, remove, modify, refine or replace some of the indicators to suit the local context at each location. This flexibility is important to adequately reflect the viewpoints of the people at each location. Considering that the underlying processes governing change, their causes, consequences and household coping strategies in almost all locations were guided by more or less the same factors, it should be possible to arrive at a set of composite indicators that convey the viewpoints of a larger number of villages at the macro level.

If the indicators, and ways of obtaining information about them, are objective and replicable enough, the ranking would remain more or less constant at any particular period of time, regardless of the person conducting the exercise. Once this is established, the ranking exercise can be used to monitor the progress of indicators both at a composite level (i.e. whether the overall rank of the family increased or decreased over a period of time) and at the individual indicator level (i.e. whether a household's status improved or declined with respect to a particular indicator), and depending on the kind of assets provided to the poor.

WEALTH RANKING OF KEY STAKEHOLDERS IN THE FISHERIES SECTOR

Using the information obtained from the field research, it was possible to develop a general picture of the different groupings of wealthy and poor people in the villages.

Features of well-being in coastal fishing communities

According to the community's perception, the better-off individuals are those that have strong and assured access to resources (natural, physical, social, financial and human), as well as to policies, processes and institutions. They have the ability to turn the impacts of key trends, seasonality and shocks to their advantage, to withstand their effects, and to return to normalcy relatively quickly. Well-off families generally earn enough surpluses to feel confident about lean periods as well as about the future in general.

People who have security of employment – particularly those with government jobs – are well off. People in rich families, if employed, work in managerial positions; they seldom work in labour-intensive activities themselves, preferring instead to employ workers for such activities.

People who have successfully diversified their operations into other sectors and areas, such as agriculture, boatbuilding, trading, transport, civil construction contracts (roads and house building), plantations, industries, etc. are considered to have reasonably lower levels of risk and stable incomes. In fact, the vulnerability of a person or a household to the vagaries of nature reportedly decreases as the person or household moves away from direct fishing activities. Their investment in agriculture or plantations is more a way of securing their asset base than of earning income from it. Because the value of agricultural land goes up all the time, irrespective of the status of the agricultural economy in the area, it is considered prudent to own farm land as an investment. In the 1990s, a shift to aquaculture automatically enhanced the economic and social status of a family, because the income from a successful crop was many times more than a household could earn in years of fishing. In addition, the ownership of the land required for aquaculture acted as a buffer against future vulnerability. However, aquaculture lost much of its sheen by the late 1990s.

Those who can afford to obtain quality health care (often equated with private, hence expensive, medical facilities in urban areas), send their children to 'convent' schools (where the language of instruction is English), have a good house located strategically in the village, have their own drinking-water facilities, latrines and other

amenities, bank accounts and a strong decision-making role in village affairs are considered as being 'boatbuilders', i.e. well off. Their houses have separate cooking, living and sleeping quarters and often a television. Their modes of transport are generally motorized – two wheelers such as scooters or motorcycles or even (rarely) cars – so their dependence on public transport is not as heavy as that of the poor. They tend to be better educated than others, and hence have the most opportunity to interact with government officers. People who can afford to visit the nearby town regularly for shopping or entertainment (watching films) and with their families were also placed in the better-off bracket.

Invariably, government employees, people with large agricultural holdings and/or a fleet of boats, ice plant operators and trader-financiers are considered 'boatbuilders' in most villages.

Categories of poor in coastal fishing communities

As the foregoing sections have shown, low incomes,[8] seasonality of occupations, the need for diversification of livelihood strategies, a poor and dwindling natural asset base, poor housing, lack of food and nutritional security, poor health and access to health care systems are features that affect most fishing communities. However, differences exist in terms of the degree of deprivation and its impacts upon different people. Based upon the intensity and impact of structural and systemic features, the poor have been broadly grouped under three categories.

***Generally poor (or marginal/temporary poor)**. Low, but increasing structural and/or systemic poverty*. In terms of vulnerability, this group ranks higher than the poorer and destitute groups – hence the name 'tomorrow's poor'. Fishermen (including owners and crew members) of a productive age group – both owners and crew members, for instance, fall in this 'vulnerable' group. Given the dwindling fish catch, increasing cost of replacing aging boats, general absence of a savings culture, failing social networks, lack of insurance and numerous other uncertainties facing them, today's active fishers run a real risk of ending up as tomorrow's poor and vulnerable. Old age, or the sudden death of the main earning member in the family, can also quickly drag a family down the poverty ladder.

Livelihood strategies are generally fixed, but at the household level, diversification is increasingly the norm. Traditional occupations still account for a lion's share of the family income. The income of people in this category is sufficient for meeting subsistence needs throughout the year, but is highly vulnerable to seasonal fluctuations, resource and market trends, cyclones and other shocks. Because the asset base is strongly tuned towards particular occupations and sectoral affiliations, fluctuations within that occupation or sector could have potentially serious consequences. This group is characterized by higher levels of indebtedness than other categories of the poor, a reflection of their creditworthiness as well as their vulnerability. Their main source of credit is trader-financiers. Some may also have received assistance for housing, boats and other assets in cash or kind from development credit systems.

Housing is generally a thatched hut, but where government housing exists, the family could be living in a *pucca* house. In cases of government housing, more than one family tends to share the accommodation. Sometimes residents pay a rent to reputed owners, who may be residing elsewhere. Normally, living and cooking areas

[8] Although poor income has been one of the most important criteria in deciding the poverty of a family, it is very difficult to obtain a good, reliable understanding of income levels in fishing communities, considering the seasonal fluctuations, diversified occupational profiles, differences in sharing systems, and physical, geographical and social differences that exist between different communities. The income of a household as reported in secondary data – for issuing PDS ration cards or the identifying of beneficiaries by rural development agencies, etc. has been used to decide income levels.

are separate. Health care can be either within the village or at the government facilities in nearby towns.

Cooking is done with kerosene stoves and sometimes firewood. Firewood is generally bought from local sellers, but occasionally collected directly from the mangroves and casuarina groves. Up to 50 percent of the income is spent on food needs.

Very poor. There are two subcategories. The first is of people who feel the impact of *structural* poverty, i.e. endowment, more than *systemic* poverty. People in remote fishing villages, aged and physically disabled people are examples of this kind of poor. The other category consists of those who suffer more from *systemic* poverty, or access, than from *structural* poverty. Examples are fish traders of different linguistic/caste/religious/geographic origins and single-woman-headed households. The latter often constitute the invisible poor.

Daily wages in this category are characterized as barely sufficient to meet subsistence needs, and little or no surplus is generated for lean periods. Although the primary livelihood is generally the same through the year, there is also seasonal and intrahousehold diversification into other occupations, within and outside the sector and geographical area. Seasonal hunger and hunger-related illnesses are prevalent. Health care facilities are generally within the villages. Their sources of credit consist mostly of friends and relatives within the villages and sometimes itinerant moneylenders, but seldom trader-financiers.

Housing is confined to thatched huts, often close to the beach. Because land is freely available in most coastal villages, constructing a thatched hut is not an expensive proposition, although each hut sometimes houses more than one family in response to the increasing congestion within villages. The huts are usually one-room structures, and cooking is done in the open using firewood collected from mangroves or casuarina groves. A large proportion of the family income in this category is spent on meeting food needs.

Destitute. The poorest of the poor are characterized by *high systemic and structural poverty*. A poor asset base and very limited access to the assets needed for meeting basic needs characterize this category of people. People who depend on charity, such as beggars, or on scavenging, such as fish collectors from the landing centres, or those pursuing criminalized/illegal occupations, such as shrimp-seed or mangrove wood collection, constitute this category of poor.

The livelihoods in this category are characterized by insufficiency and uncertainty. In many cases, the livelihood profiles are varied and any specific occupational and sectoral affiliation is tenuous at best. Daily earnings are insufficient to meet basic subsistence needs throughout the year, and frequent hunger is a prominent feature of households in this category. Another important characteristic of this group is the prevalence of illnesses and the near complete lack of access to any health care facilities. Their access to credit – either from formal or informal sources or even from their neighbours – is extremely limited, if not non-existent.

Housing consists either of makeshift huts on the beach or other vulnerable low-lying areas, or simply of sleeping space on verandas belonging to other families. Cooking utensils, when they exist, are the barest minimum, and cooking is done with firewood procured from nearby plantations or mangroves or by scavenging in the village. Often they depend on food given away by better-off families; hence the need for fuelwood does not arise. Almost all their income is spent on meeting their food needs and they depend on the charity of others to meet their other needs.

Categorization of different fisheries stakeholder groups

Although there is an implicit link between the livelihood activities of fishers and their poverty, it is difficult to link a particular livelihood group to one poverty category right

across the state. Even within the same livelihood groups, different households are often involved in a variety of livelihood activities. This makes it extremely difficult – and often contentious – to define one livelihood group as being 'poor', 'very poor' or 'destitute'. Intrahousehold differences in access to different assets make it clear that generalizations can produce faulty conclusions.

Consequently, while it is possible to identify the people at the extreme ends of the wealth spectrum – i.e. the affluent and destitute groups – classifying those in the intermediate categories, who constitute a sizeable chunk of the workforce in the sector, is a tricky proposition. A key issue with respect to people in these categories is that a large majority of them constantly move up and down the economic scale as a result of the dynamic nature of their access (i.e. entitlements) to various resources. This access varies with location – the same category of stakeholders in different areas may have different kinds of access to the same resource – and also with time – the same group may have a different kind of access seasonally or over a period of years.

Gender, age and caste play a significant role in enhancing or reducing the access to many livelihood strategies or assets. Similarly, ownership of productive assets and/or use rights to fishing grounds – or the lack thereof – as well as involvement in particular activities are good indicators and determinants of poverty in a family. While caste may be an important determinant of the social position of a group in Orissa, it is the geographical and linguistic background of a household or even a community that often has a more important determining influence upon its well-being. The location in which a particular community resides determines the overall well-being of the community itself. *Thus the indicators of poverty must come from the underlying systemic factors that determine access to various resources, rather than from the specific access to specific resources.*

TABLE 16
Composite rank for each stakeholder group based on primary livelihood activity

Stakeholder group	Rank (1–8)[1]
Fishing crew – non-motorized	4
Fishing crew – motorized (including BLC)	5
Fishing crew – mechanized	6
Boat owners – non-motorized	5
Boat owners – motorized (including BLC)	6
Boat owners – mechanized	7
Beach seine owners	6
Bedha jal fishers and labourers	3
Crab fishers (men in Chilika)	5
Crab fishers (women in Kendrapara)	3
Cast net/push net fishers	3
Shell collectors (men and women)	2
Shell processors and traders	3
Aquaculturists – large-scale	7
Aquaculturists – small-scale	3
Aquaculture labourers	4
Shrimp-seed collectors	1
Fish processors (small-scale)	4
Fish processors (large-scale – men)	7
Fish processors (large-scale – women)	5
Fishmeal manufacturers – small-scale	2
Fishmeal manufacturers – large-scale	5
Shrimp peelers (village/household-based)	3
Shrimp peelers (harbour-based)	4
Shrimp peelers (factory-based)	5
Women petty traders	3
Bicycle fish vendors – men	5
Snack vendors (exchanging snacks for fish)	1
Resellers on the beach – men	4
Resellers on the beach – women	2
Commission agents – men	7
Commission agents – women	4
Company agents	7
Large-scale trader/financiers	8
Fish carriers (men in Balasore area)	3
Fish carriers (women in Puri)	2
Auctioneers and auctioneers' assistants	5
Procurement and packaging assistants	3
Suppliers of ice	8
Transport owners	7
Transport workers	5
Net menders (women and old people)	2
Traditional processing assistants	2
Traditional boatbuilders and repairers	5
Engine mechanics	5
Basket weavers	3
Fish collectors (charity, for trade)	1

[1] 1 = extremely poor, 8 = very well off.

The field studies in eight villages followed by the wider validation exercises made it possible to develop a composite rank for each of the different stakeholder groups based on their primary livelihood activity, which is given in Table 16. Some of these categories subsume a number of different subcategories. However, as long as their ranking in their respective areas of operation is comparable, they have been considered as one category. There are differences based upon gender, age and caste in each category and, where they were found relevant, these were included separately.

Table 17 provides a benchmark for categorizing people as boatbuilder, poor, very poor and destitute based on their occupations, provided that the occupation is *the*

TABLE 17
Consolidation of different livelihood groups into different wealth categories

Well-off (7-8) – 'Boatbuilder'	Marginal to poor (5-6)
Boat owners – mechanized	Fishing crew – motorized (including BLC)
Large-scale aquaculturists	Fishing crew – mechanized
Fish processors (large-scale – men)	Boat owners – non-motorized
Company agents	Boat owners – motorized
Large-scale trader-financiers	Beach seine owners
Ice suppliers	Crab fishers (men)
Transport owners	Fish processors – large-scale (women)
	Fishmeal manufacturers – large-scale
	Shrimp peelers – factory-based
	Bicycle fish vendors
	Auctioneers and assistants
	Transport workers
	Traditional boatbuilders and repairers
	Engine mechanics

Very Poor (3-4)	Destitute (1-2)
Fishing crew – non-motorized	Shell collectors
Bedha jal fishers and labourers	Shrimp-seed collectors
Crab fishers (women)	Fishmeal manufacturers – small-scale
Cast net/push net fishers	Snack vendors
Aquaculturists – small-scale	Resellers on the beach – women
Shell processors and traders	Fish carriers – women
Aquaculture labourers	Net menders
Fish processors – small-scale	Traditional processing assistants
Shrimp peelers – village/household/harbour-based	Fish collectors (charity, for trade)
Petty traders – women	
Resellers on the beach – men	
Fish carriers – men	
Procurement and packaging assistants	
Basket weavers	

primary activity on which a household depends. Thus it can be said that a household whose main livelihood comes from collecting shrimp seed falls into the category of the destitute, and another household whose main earner works onboard a motorized FRP boat falls into the poor category. Male fish processors involved in large-scale operations tend to be well off, while women involved in the same activity fall into the poor category because of their reduced access to markets and higher vulnerability to market fluctuations.

Number of poor people in the fishing sector in Orissa

Community interactions during the field research yielded the following estimated percentages of people belonging to various wealth/poverty categories in the villages (Table 18). Although the figures have been cross-checked with different groups in the villages for their validity, they must be treated as indicative and representing an approximation of the numbers of people in each category. It is expected that a thorough survey of different livelihood categories as was categorized in Table 17 would provide a more accurate picture of the numbers of people in each category.

Of the total number of poor people in a village, roughly 10 percent fall in the 'well-off' category (with a range of 5-15 percent), 30 to 40 percent in the 'marginal to poor' category, about 40-50 percent in the 'poor to very poor' category, and about 10 percent in the 'very poor to destitute' category. Using these indicative percentages, it was

TABLE 18
Estimated percentages belonging to various poverty categories

	Well-off	Marginal to poor	Very poor	Destitute
Mirzapur	5	40	50	5
Balarampur	10	30	45	15
Tikayatnagar	5	15	65	15
Khairnasi	15	50	25	10
Sandhakuda	15	20	60	5
Puri-Pentakota	10	50	30	10
Khirsahi	10	40	40	10
Badanolianuagaon	10	35	45	10
Total	80	280	360	80
Average percentage across 8 villages	10	35	45	10

possible to arrive at approximations of numbers of people belonging to different categories of poverty in the state as a whole (Table 19).

TABLE 19
Approximations of numbers of people belonging to different poverty categories

Total marine population	332 772
Well-off	30 000
Marginal to poor (30–40%)	100 000–133 000
Very poor (40–50%)	133 000–166 000
Destitute	33 000

Obviously, differences exist in defining the poor, very poor and destitute in different villages, and at different times (because the notion of poverty itself keeps changing with the changes in socio-economic conditions of a community or an area). Hence the classification of the poor into these categories is at best an indicative measure.

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Note: This summary document is an edited version of the main outputs of the study, which contained references to the full bibliography as given here. The bibliography is retained in full for the benefit of future researchers.

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This study analyses the livelihoods of marine fishing communities in the Indian coastal state of Orissa using the sustainable livelihoods approach. It investigates the relationships between livelihoods and coastal poverty and seeks to develop simple qualitative indicators to monitor the changes in these relationships over time. The key trends affecting the livelihoods of the poor in the coastal fishing communities in Orissa range across the whole spectrum of "assets" – i.e. the natural, physical, social, human and financial – and contribute to changes in terms of availability as well as access to the assets for the poorer stakeholders. This paper also examines the impact of seasonality and shocks upon the fisheries-based livelihoods and the importance and influence of various policies, institutions and processes in addressing the fishers' need to cope with their vulnerability context in a meaningful manner. It summarizes the various factors having an impact upon the livelihoods of the fishers and develops them into simple indicators relevant in assessing the changing patterns of poverty in fishing communities of Orissa.

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