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Livelihoods In Coastal Fishing Communities, And The Marine Fish Marketing System Of Bangladesh

Synthesis of Participatory Rural Appraisals in Six Villages, and Assessment of the Marketing System

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LIVELIHOODS IN COASTAL FISHING COMMUNITIES, AND THE MARINE FISH MARKETING SYSTEM OF BANGLADESH

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Abbreviations

ADB	Asian Development Bank
BCAS	Bangladesh Centre for Advanced Studies
BFRI	Bangladesh Fisheries Research Institute
BOBP	Bay of Bengal Programme
CBO	Community Based Organisation
CODEC	Community Development Centre, Chittagong, Bangladesh
COFCON	Coastal Fisherfolk Community Network, Bangladesh
DANIDA	Danish International Development Agency
DFID	UK Department for International Development
GoB	Government of Bangladesh
MoFL	Ministry of Fisheries and Livestock, GoB
DoF	Department of Fisheries, GoB
ICLARM	International Centre for Living Aquatic Resources Management
IGAs	Income Generating Activities
IMM	Integrated Marine Management Ltd.
MES	Meghna Estuary Study
MFI	Micro-Finance Institution
NGO	Non-Governmental Organisation
NRI	Natural Resources Institute, University of Greenwich, UK
PHFRP	DFID Post-Harvest Fisheries Research Programme
PRA	Participatory Rural Appraisal
RMA	Rapid Market Assessment
SUFER	Support for University Fisheries Education and Research, DFID funded project based in Dhaka, Bangladesh
UoC	University of Chittagong, Bangladesh
SL	Sustainable Livelihoods
VO	Village Organisation

Glossary

<i>Arat</i>	Generally an office, a store, or a warehouse in a market place from which an <i>aratdar</i> conducts his business.
<i>Aratdar</i>	Main actor in the fish distribution system; either acts as wholesaler or commission agent, or covers both functions at the same time; carries out public auctions, and is the main provider of credit in the marketing chain.
<i>Bahaddar</i>	Owner of fishing boat.
<i>Bazaar</i>	Market
<i>Bepari</i>	Middleman in the marketing chain who transports the fish to other Districts; use of term depends on the location; sometimes also used synonymously with retailer.
<i>Chalani</i>	Same as <i>bepari</i>
<i>Crore</i>	Ten million.
<i>Dadan</i>	Loan as part of interlocked credit-marketing transactions, whereby, traditionally, the loanee has to sell to/ through the loan provider at a discounted price.

<i>Dadandar</i>	Provider of <i>dadan</i> loan; traditionally acts as moneylender cum trader.
<i>Faria</i>	Local itinerant fish trader.
<i>Lakh</i>	One hundred thousand.
<i>Hat</i>	(Small) market place where market exchanges are carried out either once, twice, or thrice a week, however not every day.
<i>Jaal</i>	Fishing net (note there is a large number of different types of nets, as described in the text)
<i>Mahajan</i>	Traditional moneylender.
<i>Mahji</i>	Captain of boat.
<i>Mokam</i>	Markets; important fish markets in district capitals are often referred to as Head <i>Mokam</i> .
<i>Nickarie</i>	Local retailer
<i>Paiker</i>	Middleman in the fish marketing chain; often covers the assembly function in the chain, acting as <i>dadandar</i> at the same time; depending on the location sometimes also referred to as wholesaler or retailer.

Exchange Rates (July 2002)

1 Pound Sterling (£) = 89.69 Taka (Tk)
 1 US Dollar (\$) = 57.32 Taka (Tk)

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SUMMARY

This report is an output of the DFID funded research project “**Fish Distribution from Coastal Communities – Credit and Market Access Issues**”. The field research was carried out between July 2001 and April 2002. In addition to the inception workshop in Chittagong in March 2001 consultation workshops were held in July 2002 in Dhaka and Chittagong, where project findings were presented to stakeholders from the fishing communities, the trading sector, the Government of Bangladesh, NGOs, and members of the donor community.

This report mainly presents the findings of fieldwork by CODEC and NRI using Participatory Rural Appraisal and Rapid Market Assessment techniques. A combination of Sustainable Livelihoods Approach and marketing economics was used for analytical purposes. Separate questionnaire surveys were conducted by the University of Chittagong Marketing and Sociology Departments, the results of which are presented in the report of the consultation workshops conducted by the project in Chittagong and Dhaka in July 2002.

Access to fishery resources in the sea and the river is the traditional livelihoods asset of households in a coastal fishing community in Bangladesh. This is complemented by gear such as boats and nets. Other assets include land and means of agricultural production, transport, health, education and financial resources in the form of savings, cash, or credit.

Different wealth categories exist within the fishing villages. According to the villagers’ own judgement, the proportion of the poor (i.e. moderate poor to very poor) within the fishing communities is of the order of 50 – 70% in the communities where the research took place. It has been observed that the number of households belonging to the hardcore poor is relatively less in villages which have direct access to the open sea. This may be related to the development of nearby tourist spots (i.e. Cox’s Bazaar and Kuakata Beach, respectively), and more alternative income opportunities as a result of this. In addition, the availability of shrimp seeds and other less valued species in the adjacent Bay of Bengal provide poor people with comparatively better livelihood opportunities than in other places. At the same time, it needs to be borne in mind that there is often little difference in the living standards between the so-called middle classes in the villages and the poor.

Landless households, widows or divorced women, households with either no children or large numbers of children (i.e. especially girls, who will require dowry to get married), and families without regular income represent the most vulnerable households.

Factors that cause poverty in the communities include, declining fish catches, lack of security (mainly in the fishing grounds due to piracy), natural disasters such as cyclones or floods, lack of capital, lack of employment opportunities, and lack of health and education /skills.

Both fishermen and traders state declining fish supplies and piracy in the sea and on the rivers as their main problems. Some stakeholders such as *aratdars* predict that

only deep-sea fishing will survive in the long-run. Also, more concentration is likely to occur within fishing communities (i.e. fewer people will own bigger boats).

Where catches will decline beyond a certain level, this may well lead to uncompetitive situations to the extent that traders and moneylenders will pull out of affected locations. This will most likely result in a less efficient marketing system in that trading competition will decrease.

In addition to the demand for seafood products in overseas markets, there are exports of certain marine fish species (e.g. *hilsha*, jewfish) to India, Hong Kong and other countries. This appears to put upward pressure on domestic prices.

The decline in supplies of domestic marine fish is at least partly compensated for by increased production of freshwater fish (i.e. mostly from aquaculture), and imports of fresh and dried fish from Myanmar and India.

Although there is scope for improvement, marketing is less of a constraint according to the stakeholders consulted. Areas which can potentially be targeted for marketing related improvements include, more emphasis on marketing training at community level, improvements of market infrastructure (i.e. often only small improvements are required), better post-harvest handling practices (including reduction of chemical use in dried fish processing), and better exploitation of export opportunities.

Overall, the marine fish marketing system is quite efficient in that physical and qualitative losses are small. The marketing margins appear reasonable given the highly perishable nature of the product. In particular, this applies to the case of fresh marine fish marketing. The dried fish distribution system is also efficient, however fishermen supplying the processing industry receive low prices for their fish when there is a glut in the main season especially in the more remote areas.

If fishermen are “exploited” due to loan arrangements with traders, this reflects inefficiencies of the credit system (the opportunity cost of capital is very high in Bangladesh; i.e. 5 – 15% interest per month). Nevertheless, there are variations in the informal credit system and changes are taking place. The credit conditions are more favourable in certain locations compared to others. In particular, lower informal interest rates have been observed where NGOs are active with micro-finance programmes.

The production and marketing of dried fish will see changes. Although dried fish processing and trading will still provide employment for large numbers of people in the foreseeable future, in the long-term it is expected that less fish will be processed, even in remote areas, as a result of:

- declining fish catches,
- increased demand for fresh fish (due to increases in population and purchasing power)
- better transport links,
- ice supply, and other means of preservation.

At the same time, some fish will continue to be consumed mainly in dried form (e.g. ribbon fish). Also, there is a demand for good quality dried fish for export, which according to traders is currently not met.

Some of the traders will be squeezed out; e.g. there will be more concentration at wholesaler level. The contradiction between market efficiency and equity will remain at the retailer level. On the one hand, many retailers and vendors including women (i.e. 10 – 20% of retail traders are estimated to be female) depend on fish marketing for their livelihoods, on the other hand this considerably adds to the marketing margin. Ultimately, it will be the consumers who will have to bear this cost.

Due to declining fish supplies, parts of coastal fishing communities will be forced out of the fishery to seek other employment. As a consequence, alternative income generating activities (IGAs) need to be urgently identified and created.

The following section provides a summary of the livelihoods constraints identified by the fishing communities and stakeholders in the marketing chain, and related policy recommendations.

Key Findings and Recommendations for Policy Implementation

The following sections provide a synthesis of the main issues arising from the study and related policy recommendations. The latter are primarily aimed at decision makers in the Government, the donor community, and the NGO and private sectors. The sections cover the more general issues related to the livelihoods of the coastal communities before dealing with specific marketing and credit related issues.

Declining catches of marine fish

Substantial increases of marine fish catches have taken place between 1975 and the early 1990s. Since then a gradual decline of catches has been observed by the fisherfolk of coastal communities and traders specialised in marine fish. However, it needs to be pointed out that the decline is not linear and that some years are better than others (e.g. 2001 was considered better than the previous years). Nevertheless, the threat of declining fish stocks is highly present in coastal communities. This environmental shock is likely to have major consequences upon the livelihoods of those concerned.

The main reasons stated for the decline in catches include:

- Overfishing, due to big commercial trawlers, increased number of boats, use of more efficient / destructive gear, etc.
- Pollution due to agricultural chemicals, fertilisers, industrial wastage, oil discharge from boats, ship-breaking yards etc.
- According to fishermen, changes in the natural environment (e.g. changes in the seabed, siltation).

Suggestions for Policy Implementation:

- A more effective control of industrial trawling needs to be established;
- The issue of un-authorized fishing by foreign trawlers needs to be addressed at inter-governmental levels;
- In order to accommodate the needs of those leaving the sector as a result of management measures, the creation of alternative Income Generating Activities (IGAs) is required;
- Stricter pollution controls need to be imposed;
- Improved involvement of poor coastal communities in decision making regarding fisheries management is required;
- A scientific assessment of fish stocks and changes in the natural habitat is needed.

Unsatisfactory law and order situation

The current law and order situation is characterised by an increasing incidence of violence in coastal fishing communities and markets. In particular, an increase in violence was reported between 2001 and 2002.

This is reflected in the following:

- Increasing levels of piracy in the sea and on the rivers resulting in loss of gear and fish on board ; injuries and even deaths of fishing crew are becoming increasingly common;
- Extortion of money or fish from traders takes place in major markets.

Suggestions for Policy Implementation:

- The piracy in open waters needs to be arrested through deployment of Coastguard and other law- enforcing agencies;
- Community organisation and policing needs to be strengthened, with Government and NGO support; similarly, trader associations need to be strengthened (i.e. it was reported that harassment was less common when trader associations were stronger);
- Advocacy activities by press, NGOs, and local communities need to be encouraged.

Lack of Credit Access

Lack of financial resources and related issues have figured highly amongst the livelihoods constraints expressed by communities. This is in spite of NGO micro-finance interventions in the majority of villages, and, in some cases, a lowering of informal interest rates as a result of this.

The key issues of micro-finance can be summarised as follows:

- The hardcore poor (estimated at 20% of coastal population) do not have access to formal or informal credit;
- The currently existing micro-finance schemes are often not appropriate for coastal communities;

- The opportunity cost of capital is very high in the informal sector (e.g. 5 – 15% interest per month); this is also reflected in *dadan* transactions;
- Even larger-scale operators in the commodity chain (e.g. *aratdars*) do not have easy access to bank credits, as a result of requirements imposed by banks.

Suggestions for Policy Implementation:

- A coherent policy needs to be formulated for micro-finance institutions (e.g. lending framework);
- The creation of a special bank / financial institution that can address the needs of the coastal communities is recommended;
- A review and redesign of micro-credit products for coastal communities is needed; more emphasis, in this regard, needs to be placed on savings;
- It is suggested that lending by NGOs takes place against productive purposes on flexible terms reflecting local conditions (e.g. risk, seasonality, amount of loan required, income streams, etc).

Governance related Issues

Many of the issues raised by fishing communities and other stakeholders are of an institutional nature originating in weak governance.

The current situation is as follows:

- There is weak local governance due to lack of clear policies and inadequate autonomy of local government;
- The government extension services related to key sectors such as fisheries, agriculture, and health and education, are inadequate;
- Government policies are characterised by:
 - Inadequate addressing of poverty;
 - Poor implementation;
 - Coastal areas have weak representation at Central level.

Suggestions for Policy Implementation:

- The formulation of policies and implementation thereof needs to be improved;
- A review and strengthening of the extension system is required. For example, better accountability of services to the communities needs to be introduced, and community based organisations (CBOs) should become increasingly involved in the delivery of extension services;
- The Government should be more participatory, representative, and poverty focussed, as far as coastal areas are concerned;

Environmental degradation in coastal areas

The majority of areas studied suffer from severe environmental degradation. This is in addition to declining fish stock.

The situation can be summarised as follows:

- The coastal belt is very vulnerable to natural disasters such as cyclones and floods;
- Erosion, in particular in riverine areas, aggravates this situation, leading to deteriorating socio-economic phenomena such as migration etc.
- Forest resources are declining, including in the Sundarbans;

Suggestions for Policy Implementation:

- Continuing efforts in disaster management, including awareness raising, are required;
- A community based land reclamation project is recommended;
- Effective river management (e.g. tracing, fortification of river bank) needs to be put in place;
- Reforestation, including mangrove forests, needs to be encouraged;
- A fair distribution of *khas* / *char* land to the poor needs to be implemented; priority should be given to people whose land and homesteads on the river banks has been eroded.

Lack of alternative Income Generating Activities (IGAs)

Although there is also some inward migration in coastal areas by poor people from other parts of the country who are in search of “common pool resources”, there is a substantial amount of outward migration by coastal dwellers into the big cities. This is largely related to lack of employment opportunities and services in the coastal belt.

The current situation can be summarised as follows:

- Due to declining fisheries resources people require alternative Income Generating Activities (IGAs); in order to reduce the migration to the big cities.

Suggestions for Policy Implementation:

- Study for identification of alternative IGAs, and action-research projects by Government and NGOs are required;
- Improvement of infrastructure such as roads, ferry crossings, and electricity supply, needs to remain a Government priority;
- The skill base of the coastal population needs to be enhanced through related projects. As far as the youths are concerned, a balance between academic and vocational subjects is important;
- Linkages with markets need to be established; NGOs can play a facilitatory role in this respect;
- A more pro-business environment needs to be created, in particular at District level. Appropriate business development services need to be put in place.

Lack of Community Organisation

Despite NGO run community development projects, there is still a lack of community organisation in coastal villages. In particular, the poor lack access to organisations that may exist.

The current situation can be described as follows:

- Fishing communities are better organised in relation to issues such as health or micro-finance, however lack exposure to community marketing skills;
- There is a lack of information in fishing communities on markets (e.g. prices, market opportunities, quality requirements), and other aspects of daily life (e.g. education, health). In particular, this also includes information related to alternative IGAs.

Suggestions for Policy Implementation:

- More efforts are required with regard to the strengthening of community organisation, and better inclusion of the poor;
- Pilot testing of marketing by community organisations (CBO) should be encouraged, however this ought to be backed with adequate financial and institutional support. In addition to fisheries related enterprises, these activities should also be geared towards sectors with a potential for alternative IGAs.
- The dissemination of information on markets and other aspects of daily life in fishing communities should be improved through Coastal FM Radio Stations cum Information Centres, and other media (e.g. residential training, videos, newsletters).

At the same time it is important to take into account the lessons learnt with similar initiatives in other parts of South Asia. For example, Gordon (1997) highlights some requirements of successful fish marketing by a fishermen's group in Tamil Nadu. The key points include:

Strength of purpose and cohesion within the group, including strong leadership; sound business management; thorough training activities; learning the marketing process before large investments are made; good communication facilities; and contact with other organisations working with fishing communities.

Lack of Infrastructure

Despite improvements of the infrastructure related to transport, electricity, etc. during the 1990s, substantial efforts will still be required during the decades to come.

The main survey findings related to marketing of marine fish can be summarised as follows:

- Markets often lack basic infrastructure such as ceiling, flooring, water supplies, drainage, latrines, etc.
- Remote areas of the country still face accessibility problems;
- In some cities it is difficult to access major wholesale markets due to inadequate and congested roads;
- Landing centres at community level are unhygienic but efficient.

Suggestions for Policy Implementation:

- Up-grading of market infrastructure is required, including drainage, water supply, roofing, latrines, market access, etc.

- Besides Government initiatives, infrastructure up-grading may take place through the private sector,
- Construction of low-cost cold storage facilities is recommended. This may require incentives for private investors in the form of reduced interest rates from Government banks.
- Continued efforts are required to improve the transport system, i.e. feeder and community access roads, ferry crossings, etc;
- Landing centres should be up-graded through local government and community initiatives.

Inadequate post-harvest handling, including the supply of ice

Although fish moves relatively fast through the marketing chain, and only small physical or qualitative losses could be observed, there is still substantial scope for improvement

The key issues related to fish quality can be summarised as follows:

- Handling of fish on landing centres and in markets is often unhygienic;
- There is oversupply of ice in some areas and under-supply in other parts of the country;
- Insufficient amounts of ice are often used between catching and landing of fish;

Suggestions for Policy Implementation:

- General awareness raising and provision of appropriate information / technologies is required;
- Improved local level planning of location of ice factories to avoid over-supply in some areas and under-supply in others;
- Continued efforts are required regarding rural electrification and regular supply of power;
- General awareness raising is required to improve the use of ice;
- Owners of mechanised fishing boats need to be encouraged to transport larger amounts of ice to fishing grounds (this will only happen if they see benefits in using more ice most likely as a result of raising awareness as above);
- Identification and promotion of alternative uses of ice.

Unexploited Potential for Dry Fish Exports

Despite declining availability of dried fish on the local market, it was highlighted that there is an unexploited potential for dry fish exports to overseas markets. Better exploitation of this potential through value-added activities could provide income for coastal communities.

Summary of the situation:

- There are already exports of dried fish to a limited extent to markets in the Middle East, Far East, UK and US;

- Traders complain about a lack of exportable supply of dried fish, which is mainly due to poor quality.

Suggestions for Policy Implementation:

- Dissemination of information is required related to marketing opportunities and improved technologies;
- Strengthening of links between exporters and processors through NGOs, Chambers of Commerce, and Export Promotion Bureau.

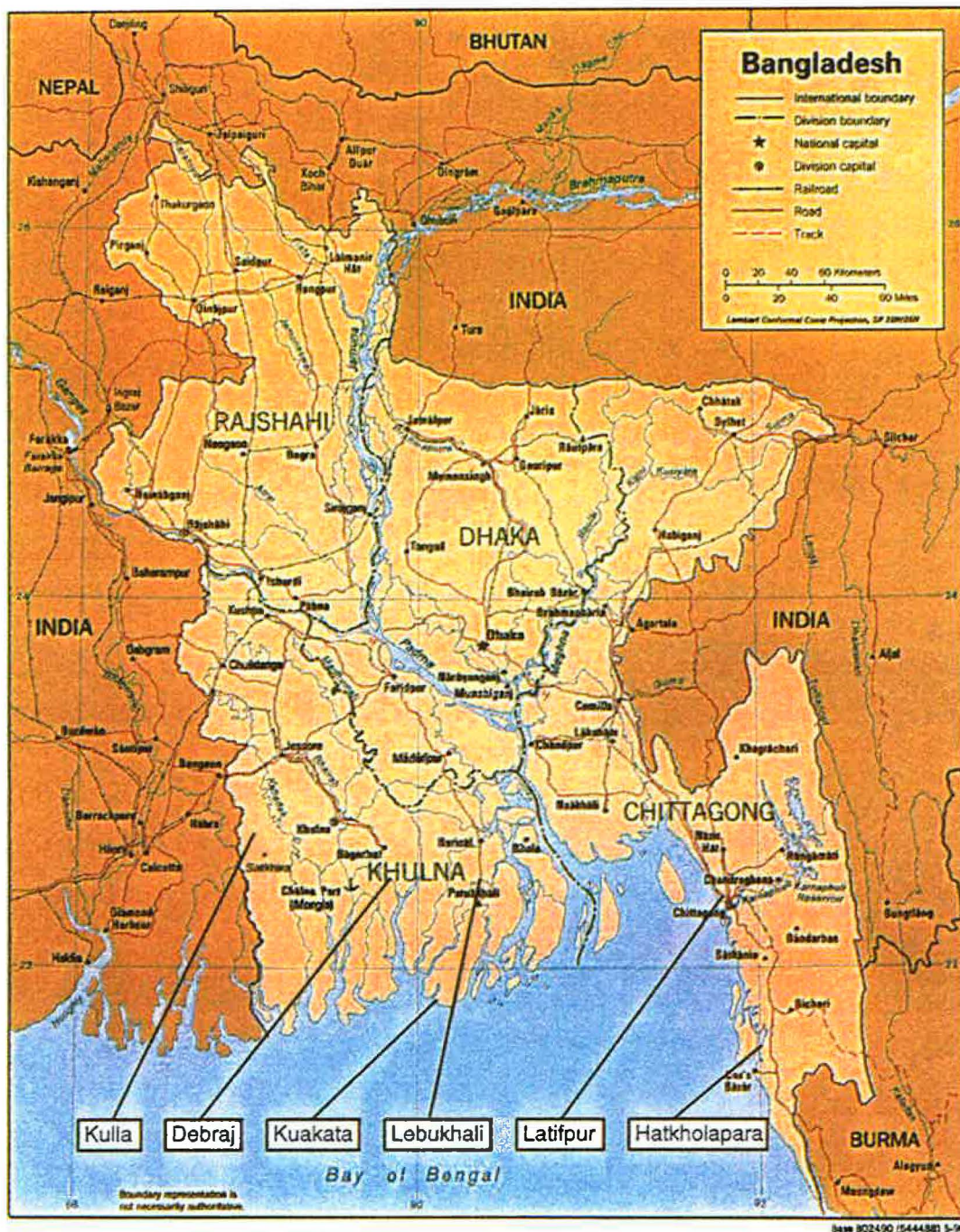
Use of Pesticides in Dry Fish Processing

The issue of pesticide use in the dry fish commodity chain can be summarised as follows:

- Although it is generally not acknowledged by traders and processors alike, there is evidence that pesticides are being used in dry fish processing, e.g. *Nogos, Basudine, Gamoxin, DDT* .

Suggestions for Policy Implementation:

- Awareness raising is required at consumer, processor, and trader levels; care is required to avoid loss of livelihoods of poor people;
- Identification and provision of safe alternative means of controlling insect infestations (e.g. use of natural insecticides and predators; better handling and processing practices). There are potential links here to other research currently funded by the DFID Post-Harvest Fisheries Research Programme in India.



Map of Bangladesh and location of villages where the survey took place

INTRODUCTION

Background to the Project

The project “Fish Distribution from Coastal Communities – Market and Credit Access Issues” started in February 2001 with funding from the UK Department for International Development (DFID). The main collaborators include the Natural Resources Institute (NRI, University of Greenwich), the NGO Community Development Centre (CODEC), and the University of Chittagong (UoC) Marketing and Sociology Departments. Activities carried out by NRI and CODEC were funded by the DFID Post-Harvest Fisheries Research Programme, and the activities undertaken by UoC were funded by the DFID Support for University Fisheries Education and Research project.

The objectives of the study included the following:

- Analysis of household livelihoods in coastal communities
- Analysis of the marine fish marketing system,
- Analysis of access to credit for poor fishermen and traders, and
- Analysis of the institutional, social, cultural and political context in coastal fishing villages.

A combination of a livelihoods approach and traditional marketing economics based on sub-sector analysis were used in investigating these topics. CODEC and NRI focused on data collection based on Participatory Rural Appraisal and Rapid Market Assessment, whereas the University of Chittagong undertook quantitative surveys based on questionnaires. The findings of the latter have been presented in three separate papers which have been included in the report of the consultation workshops mentioned below. (i.e. Institutional and Socio-political Context of Coastal Fishing Communities in Bangladesh by Chowdhury I.U. PhD; Fish Marketing System from Coastal Areas of Bangladesh by Nurul Kareem A.N.M; and Fishing Communities: Credit and Gender Issues by Solaiman Md. PhD). Due to their complementary nature, it is suggested to read these papers in conjunction with this present study.

The survey activities took place in July – September 2001, January – February 2002, and April 2002. A stakeholder workshop was organised in March 2001 at the beginning of the project, and two consultation workshops were held in July 2002 towards its end (i.e. on 22-23 July 2002 in Chittagong, and on 25 July 2002 in Dhaka).

This report primarily presents the findings of the Participatory Rural Appraisals and Rapid Market Assessments of the marine fish distribution system. The study includes an assessment of the relationship between marketing and credit. Given that fresh fish and dried fish follow separate distribution channels, it has been felt appropriate to analyse the two marketing systems separately. Although some information has also been collected on shrimp, the focus of this study is on marine fin-fish species. This is in view of other studies recently carried out on the shrimp sector in Bangladesh. Also, the research concentrated on the traditional and semi-traditional sub-sectors of the marine fishing industry in Bangladesh. Nevertheless, some aspects of the large-scale commercial sector have been highlighted.

Methodology

Topics Investigated

Although a complete separation was not always possible, the following three main research areas were covered:

Analysis of the livelihoods systems of fishing communities. This started with an investigation of the capital assets available to different wealth groups of the villages, and their vulnerability context. Other aspects included, institutional, social, cultural and political context, investigating, amongst other things, patronage relationships between traders and fishing communities, social relations between the various parties involved in the trading and credit network, and distribution of non-economic obligations and rights. In addition, emphasis was placed on poor fish producers' and traders' access to institutions affecting their livelihoods (e.g. Local Government, community based organisations, NGOs).

Analysis of the marketing system, including mapping of the sub-sector, calculation of costs and margins, assessment of the pricing mechanisms of the fish (both for the producers and consumers), risk factors such as seasonality, evaluation of technical issues (e.g. post-harvest loss, increased necessity for food safety and quality control systems), identification of bottlenecks and opportunities such as availability of marketing information. In this context, it was also assessed how population growth, changing consumption patterns, and a tendency towards marketing concentration will impact on small-scale fish producers and traders.

Analysis of the credit system, including an assessment of inter-linkages between fish distribution and credit supply, possible market inefficiencies due to exploitative practices, access to formal and informal sources of credit by poor participants in the commodity chain, relative costs of credit, assessment of possible exploitative practices, and to what extent coastal fishing communities have been able to benefit from micro-credit programmes in Bangladesh. The credit analysis and recommendations took account of the possible types of credit and the potential to link and deliver them as part of the marketing process. In addition, the work looked beyond the fisheries sector for broader micro-financing lessons and related institutional arrangements.

The Sustainable Livelihoods Approach (SLA).

A livelihoods framework combined with traditional market and economic research techniques was used to analyse the three components highlighted, focussing on capital assets (i.e. human, social, financial, physical and natural), vulnerability context, policies, institutions, and processes. (See Appendix 2 for an outline of the Sustainable Livelihoods Approach, SLA).

Elements of Sub-Sector Analysis were combined with the SLA approach in mapping and analysing the linkages between different operators in the commodity chain and information related to their livelihoods.

Geographical Area Covered

The bulk of the survey work for this project took place in intervals between July 2001 and April 2002. The main geographical areas covered during the course of data collection, include:

Six Fishing Communities in Chittagong (i.e. Latifpur village), Cox's Bazaar (Hatkhola para), Bagerhat (Debraj), Patuakhali (Kuakata-Panjupara, and Lebukhali), and Satkhira (i.e. Kulla) Districts, which were selected from the 1968 FAO census of coastal villages in Bangladesh using stratified random sampling. The following stratification criteria were used:

- Religious criteria (i.e. balance of Muslim and Hindu fishing communities);
- Location (i.e. balance between villages with direct access to the Bay of Bengal and those further inland next to rivers);
- NGO Interventions (i.e. at the outset it was envisaged to have three villages with NGO intervention, and three villages without intervention; although in the end it turned out that two of the villages supposedly without NGO presence also benefited from some form of intervention).

Assembling, wholesale and retail markets in the urban areas of Chittagong, Cox's Bazar, Dhaka, Patuakhali, Alipur / Mohipur, and Satkhira were visited. Government and Non-government Organisations, and selected members of the donor community with an interest in coastal areas were mainly consulted in Dhaka and Chittagong as part of visits and workshop attendance.

Activities Undertaken

The project started with a one-month desk research in Bangladesh and the UK to study secondary literature, and prepare the survey methodology. A workshop took place in Chittagong in March 2001, involving project collaborators and major stakeholders. This first workshop was organised at an early stage of the project in order to jointly prioritise research areas, design survey techniques and analytical tools, and identify channels of dissemination. Two consultation workshops involving the research team and other stakeholders from government (e.g. ministries, research institutes), civil society (e.g. associations), private sector, non-governmental organisations, and donor community, took place in July 2002 in Chittagong and Dhaka in order to present research findings, develop policy recommendations, and validate the methodology used.

The actual data collection mainly took place between July 2001 and April 2002, involving participatory, qualitative and quantitative survey techniques. In particular, the following survey techniques were used:

- Participatory Rural Appraisal (PRA), using techniques such as semi-structured interviewing, wealth ranking, mapping, and transect walks.
- Rapid Market Appraisal, using techniques such as semi-structured interviewing, and participatory mapping of commodity chains.

In addition, questionnaire surveys were conducted by the University of Chittagong on these topics, the results of which are presented in separate reports. This involved a training course by specialists in quantitative surveys (i.e. Statisticians) which was organised at the CODEC training centre for the UoC team in July 2001.

OVERVIEW OF THE MARINE FISHERIES SECTOR

Role of Fisheries in the Economy of Bangladesh

Bangladesh has a land area of 147,570 km² and a population of about 130 million, making it the most densely populated country in the world (i.e. other than city states such as Singapur). The Bangladesh coastline extends 710 kms along the northern edge of the Bay of Bengal, from the mouth of the Naaf river in the Southeast, to the mouth of the Raimongal river in the Southwest (COFCON and PRIP Trust, 2001). At the same time, the country is located in one of the world's major river delta systems, with the rivers meeting the Bay of Bengal in the South of the Country. A wide range of salinity levels are encountered in the rivers up to a considerable distance upstream from the shoreline of the Bay of Bengal (Habib, 1999).

Fisheries play an important role in the economy of Bangladesh in terms of nutrition, employment and income generation. The World Bank and the Bangladesh Centre for Advanced Studies (1998) state in their publication 'Bangladesh 2020', that 80 percent of the population's animal protein comes from fish. Despite the fact that the fishing industry accounts for only 8 percent of agricultural GDP¹, its employment potential is considered vast. It is estimated that the sector fully employs approximately 1.5 million people and provides part-time employment for an additional 11 million (The World Bank and the Bangladesh Centre for Advanced Studies, 1998)². According to Habib (1999), the fisheries industry contributes employment to 12% of the total working population in various forms of livelihoods activities. In the mid 1990s fisheries contributed about 10 percent of Bangladesh's export earnings.

The Meghna Estuary Study (May 1998, first draft) estimates the population living in coastal marine fishing villages at the end of the 20th Century at 7.3 million. According to the same source, in these areas fishing is the main income earning activity for 350,000 households (i.e. 22%), and 96,000 boats are operated by 350,000 fishermen.³

"Traditionally, it was the low caste Hindus who engaged in the fishing profession: the Jaladas, the Malos, the Malla Burmans, all popularly known as the Jeles, the Naiyas or the Neyes" (Alam, 1996). The last few decades have increasingly seen the entry of Muslims into the sector. On the one hand these are members of poor Muslim communities in search of new income opportunities, on the other hand wealthy individuals have invested in the marine fisheries sector once it became a profitable business.

In addition to finfish species, shrimp fry catching represents an important economic activity in that over fifty percent of all households in the villages surveyed by the Meghna Estuary Study (MES) are engaged in this occupation. Nevertheless, as

¹ According to the World Bank / BCAS Study (1998) fisheries contributes 8% of the agricultural GDP. According to Habib (1999), the fish industry contributes 16.7% to the agricultural sector.

² These figures do not distinguish between marine and freshwater fisheries.

³ These figures do not include newly established fishing villages and the fishing communities living further inland along the major rivers.

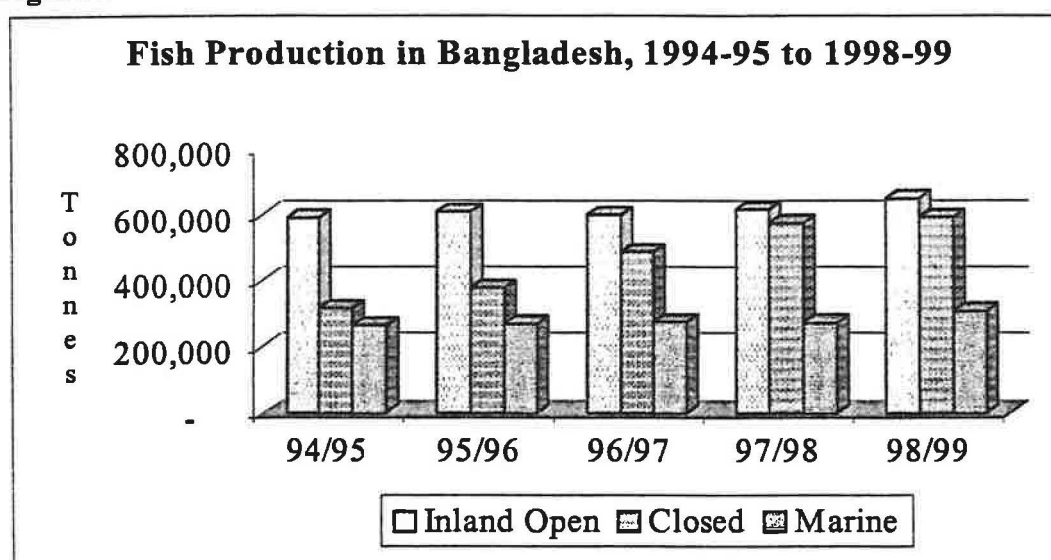
already indicated above, given the amount of recent studies on the shrimp industry of Bangladesh, the focus of this research is on finfish species.

475 finfish species have been recorded in the marine waters of Bangladesh (GoB, 1990, quoted in Habib 1999), compared to 260 species of freshwater fish (Rahman 1989, quoted in Habib 1999). A list of scientific, Bangla, and English names of fish is provided in Appendix 3.

The Supply Situation

According to figures of the Department of Fisheries, the total catch of marine fish has increased from 265,000 tonnes in 1994/95 to 310,000 tonnes in 1998/99 (17% increase). Compared to this, during the same period, the catch of fish in inland open water has increased from 591,000 tonnes to 649,000 tonnes (10% increase), whereas the production of fish from closed water bodies went up from 317,000 tonnes to 593,000 tonnes (87% increase). Figure 1 illustrates the increase of fish production according to the Department of Fisheries.

Figure 1

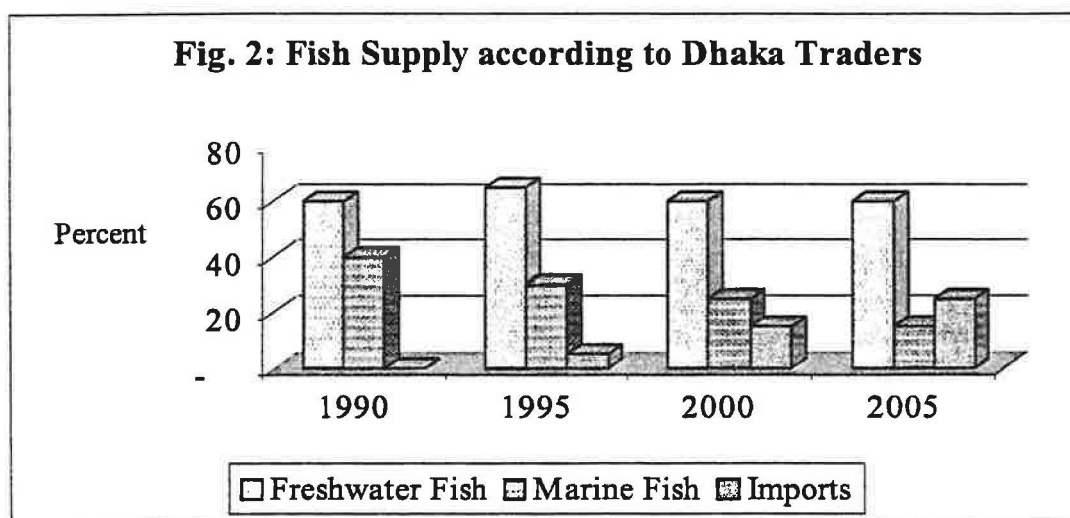


Source: Brief on Department of Fisheries (July 2000)

The above information contradicts to some extent the information obtained during the course of participatory and rapid survey exercises with fisherfolk and traders. For example, the majority of fishermen interviewed in coastal communities have stated that marine fish catches are declining since the early 1990s. Before that date (i.e. mid-1970s – 1990), catches substantially increased mainly due to the use of improved gear such as engine boats and better performing nets. At the same time, fishermen acknowledge that the decline of catches during the last decade is not linear, since there are years when the catch is better than in the previous year (e.g. the *hilsha* catch was better in 2001 than in 2000). Nevertheless, the vast majority of them agree that the overall supply trend for marine fish is negative.

Sometimes it is argued that it is only the catch per unit which is declining but not the overall catch. Following this argument, markets would be well supplied by marine

fish. On the other hand, the majority of traders specialised in marine fish equally complain about declining supplies (e.g. Chittagong, Dhaka, Cox's Bazaar, and Patuakhali). This overall picture can best be illustrated by using the estimates provided by Dhaka *aradars*. According to them, the proportion of marine fish supply from Bangladesh is gradually being replaced by freshwater fish and imports.



Source: CODEC / NRI, Trade Survey, January 2002

NB. Figures are estimates

According to these traders, the supply of freshwater fish remains at about 60%, whereas the share of the marine fish is gradually being replaced by imports. They estimate that the imports represented about 15% in 2000 but expect them to rise to 25% by 2005. As for the supply of marine fish they predict a drop to 15% by 2005. The majority of both fresh and dried fish traders in other major markets have drawn a similar picture, underlining the decline of catches of major marine fish species such as *hilsha*, and growing fish imports mainly from India and Myanmar. It should be noted that although the figures provided in the graph represent proportions, according to the traders the marine fish supply is also declining in terms of quantity.

As for the proportion of marine fish caught by the artisanal sector, this is estimated to be of the order of 95% (i.e. 257,000 tonnes out of 272,000 tonnes in 1998, Source: Statistical Year Books, DoF/BFRSS 1997-98, quoted in Rahman et al). The remaining 5% are estimated to be caught by the industrial sector. However, in the light of the above statements by traders and fishermen in coastal communities it is doubtful that this ratio still prevails. According to sources in the industrial marine fisheries sector (i.e. 84 trawlers in 2001)⁴, their catches are increasing. They claim that deep-sea shrimp is primarily caught for export and a proportion of white fish is sold on the domestic market (i.e. trash fish is not thrown overboard). Some trawlers target white fish and others shrimp.

Despite this somewhat contradicting picture, overall there are indications that the share of the marine fish caught by industrial trawlers is increasing whereas the catch

⁴ This includes 84 industrial trawlers, i.e. 42 shrimp trawlers, 29 whitefish trawlers, and 13 so-called "High Court Boats" (i.e. trawlers from neighbouring countries which were impounded by the Navy and then auctioned). Source: Trade survey in 2001.

caught by the small-scale sector (i.e. small motorised and non-motorised engine boats) is decreasing. As a consequence, it can be assumed that the share of fish caught by industrial trawlers is well above 5% of the total marine catches.

Demand

As indicated above, fish is a main staple food in Bangladeshi households. According to DoF figures the per capita fish intake in Bangladesh is 11.9kg (DoF, 2000). This contrasts with the per capita fish intake needed per annum, which is at 18.0kg (DoF, *ibid*). These figures highlight a 34% shortfall corresponding to 790,000 tonnes between supply and demand of fish.⁵

This gap between supply and demand explains the relatively high prices of fish compared to the level of income of average wage earners. This, in turn, is reflected in the reactions of the public. For example, Rahman et al (2001) have collated a series of newspaper headlines highlighting the scarcity and high price of marine fish such as *hilsha*. Nowadays, higher value fish such as *hilsha* and pomfret, can only be afforded by wealthier consumer segments. Lower income groups depend on cheaper fish such as bombay duck, and increasingly fresh water fish such as tilapia and rui.

As for dried fish, according to traders this is primarily sold to the following consumer groups:

- Poor people;
- Rural people throughout the country;
- Population of North Bengal; and
- To a substantial extent, population of Chittagong and Chittagong Hill Tracts (CHT).

It appears that poor population groups continue to consume dried fish despite its increasing prices but in smaller quantities, which are still considered sufficient to give the food its flavour. It was also reported that more dried fish is consumed during the winter and monsoon.

In addition, there is a demand for fish by Bangladeshis living outside the country (e.g. UK, USA, Middle East). They demand good quality dried or fresh fish (e.g. dried ribbon fish, fresh *hilsha*). This is in addition to the major seafood exports, which consist primarily of shrimps (i.e. 28,514 tonnes in 1999-2000, worth Taka 16,122 million, DoF 2000).

Export of fish also takes place to other countries in Asia such as India. For example, The Bangladesh Observer (16 July 2002) reports that *hilsha* worth Taka 10 – 15 *crore* is exported every year from Chandpur, but that this amount may fall to Taka 5 *crore* in 2002, due to a shortage of supplies. The equivalent of exported *hilsha* worth Taka 10 – 15 *crore* is estimated to be of the order of 500 to 1,000 tonnes. In 1999/2000, the total export of fish products other than shrimp was 10,877 tonnes valued at Taka 1,994 million. (DoF, 2000).

⁵ Assuming the demand corresponds to the amount of fish needed per capita per annum, according to DoF. This definition of demand does not take into account economic parameters such as price of the commodity, and purchasing power.

It is very likely that the export of fish influences the price of certain species on the domestic market. For example, good quality/large sized *hilsha* is high in demand for export to India, which in turn appears to contribute to its high price for Bangladeshi consumers.

Prices

During the course of the survey it was not possible to obtain price series from the official sources for the most common fresh and dried fish species in the country. As a result, the survey team has attempted to collect price data between July 2001 and July 2002 in a number of markets for the most common fish species.

It appears that in the long-term, prices of marine fish are increasing in real terms (i.e. net of inflation). Given that it was not possible to obtain price series during the course of the survey, this observation is mainly based on statements made by traders in a number of important fish markets in Bangladesh. As a consequence, as already indicated above, poorer consumer groups rely more on domestically produced and imported freshwater fish (e.g. Rui from Myanmar).

Table 1: Price of fresh fish in July 2001 in Chittagong, Fisheries Ghat

Species	Price (Tk/kg)
<i>Hilsha</i> , 1 st quality	100
<i>Hilsha</i> , large, good size	175
<i>Hilsha</i> , average quality	80 - 85
<i>Hilsha</i> , 2 nd quality	75
Shrimp	300 - 400
Pangas	60 - 80
Noakhali Pangas (big size)	100 - 125
Myanmar Pangas	50
Indian rui, fresh	75 - 80
Myanmar rui, not so fresh	50 - 60
Bombay duck	30
Shurma	60
Katamas, big size	55
Katamas, small size	30
Chuika	45

Source: Traders in Fisheries Ghat

Larger fish fetches a considerably higher price on a per weight basis. For example, large *hilsha* (1- 2 kg) would fetch a per kilogramme price double than that of small to medium sized fish of the same species (e.g. 300 – 600 grammes). As with any perishable commodity, prices fluctuate according to seasonal supply patterns. This includes price increases of dried fish between March and October.

Tables 1 – 4 provide examples of fish price data collected during the survey. For comparison, in the per unit value of exported shrimp was Taka 565 per kg and the value of other fish exported was Taka 183 per kg (DoF, 2000).

Table 2: Price of Fresh *Hilsha* in Bangladesh, Second half of July 2001

Market	Price of <i>hilsha</i> (Tk/kg)
Latifpur/Silempur, Landing centre (20 km north of Chittagong)	50 - 60
Fisheries Ghat, Chtg	80 – 85
Pahartali wholesale market, Chtg	70 – 72
Pahartali retail market, Chtg	100 – 110
Dhaka, wholesale	90 - 100
Dhaka, retail	120
Sylhet wholesale market	100
Mymensingh wholesale market	100

NB: The prices are for small to medium size *hilsha* (i.e. 300 – 600 grammes)
Source: Fish Traders in Chittagong

Table 3: Prices of Dried Loyitta (i.e. Bombay Duck) in January 2002

Markets	Price of Loyitta (Tk/kg)
Asad Gunj Wholesale Market, Chittagong	75 – 80
Kawran Bazar, Wholesale Market, Dhaka	85 – 90
Retail Markets in Dhaka	100 - 120

Source: Dried Fish Traders in Dhaka, January 2002

Table 4: Dried Fish Prices Paid to Kuakata Processors by Traders in Chittagong (Tk/kg)

Species	Nov. 2001	January 2002	April 2002 (expected)
Bombay duck	65 – 70	75 – 80	80 – 90, upto 100
Shark	65 – 70	72 – 90	55 – 60
Chapla pata	28 – 32	48 – 55	30 – 32
Suna bain	50 – 55	60 - 65	75 – 80

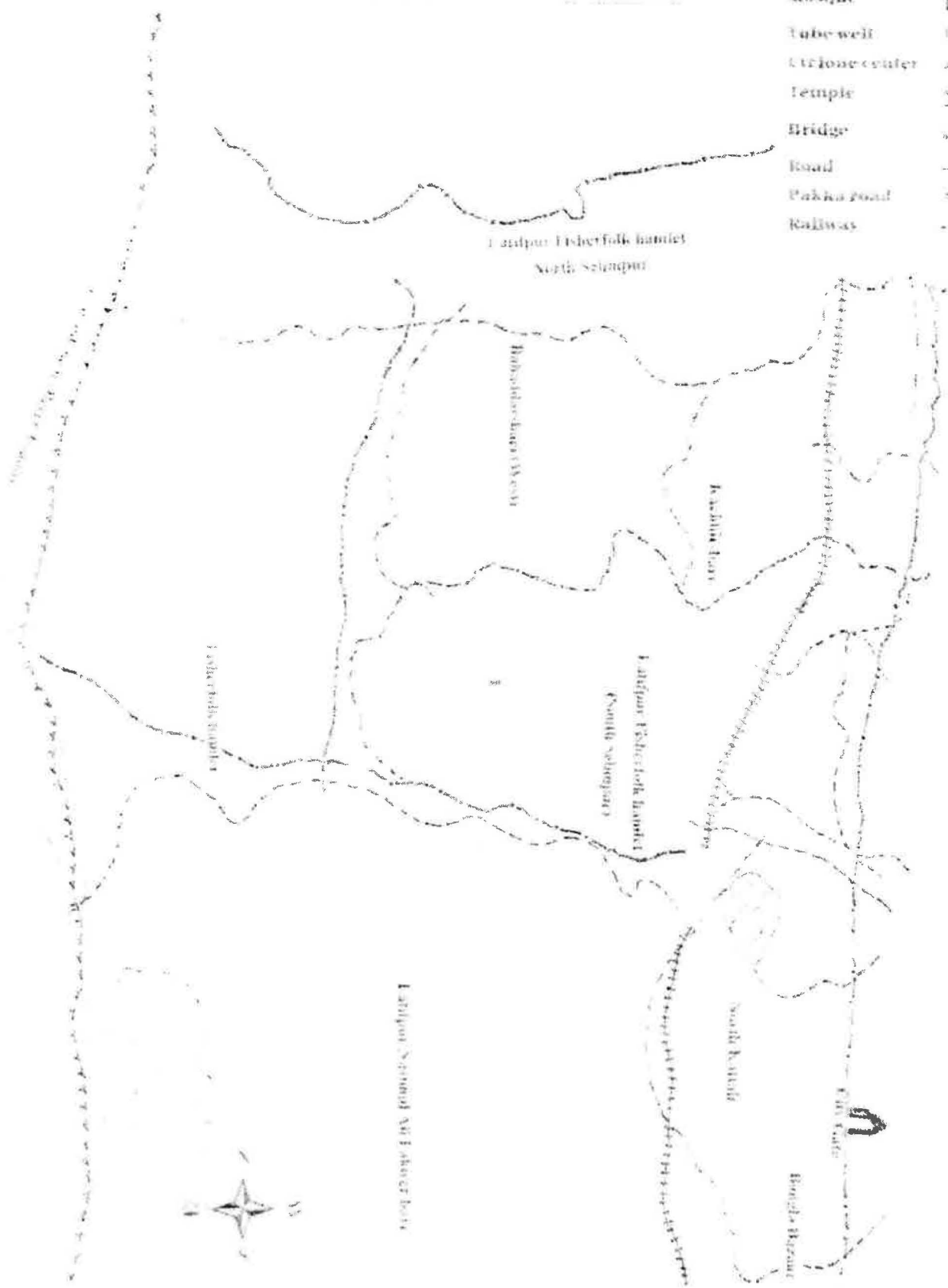
Source: Fish processors in Kuakata, January 2002

More information on fish prices collected by CODEC staff during the course of the survey (i.e. mid-2001 to mid-2002) is contained in Appendix 1.

Map of Latifpur, Chittagong

Legend

- Mosque 
- Tube-well 
- Urban center 
- Temple 
- Bridge 
- Road 
- Pukka road 
- Railway 



Map of Hatkholapara, Cox's Bazaar

- Mosque
- Tube well
- Market
- Bridge
- Road
- Primary School
- River
- Embarkment
- Cyclone centre



Mahesh Chandra Das

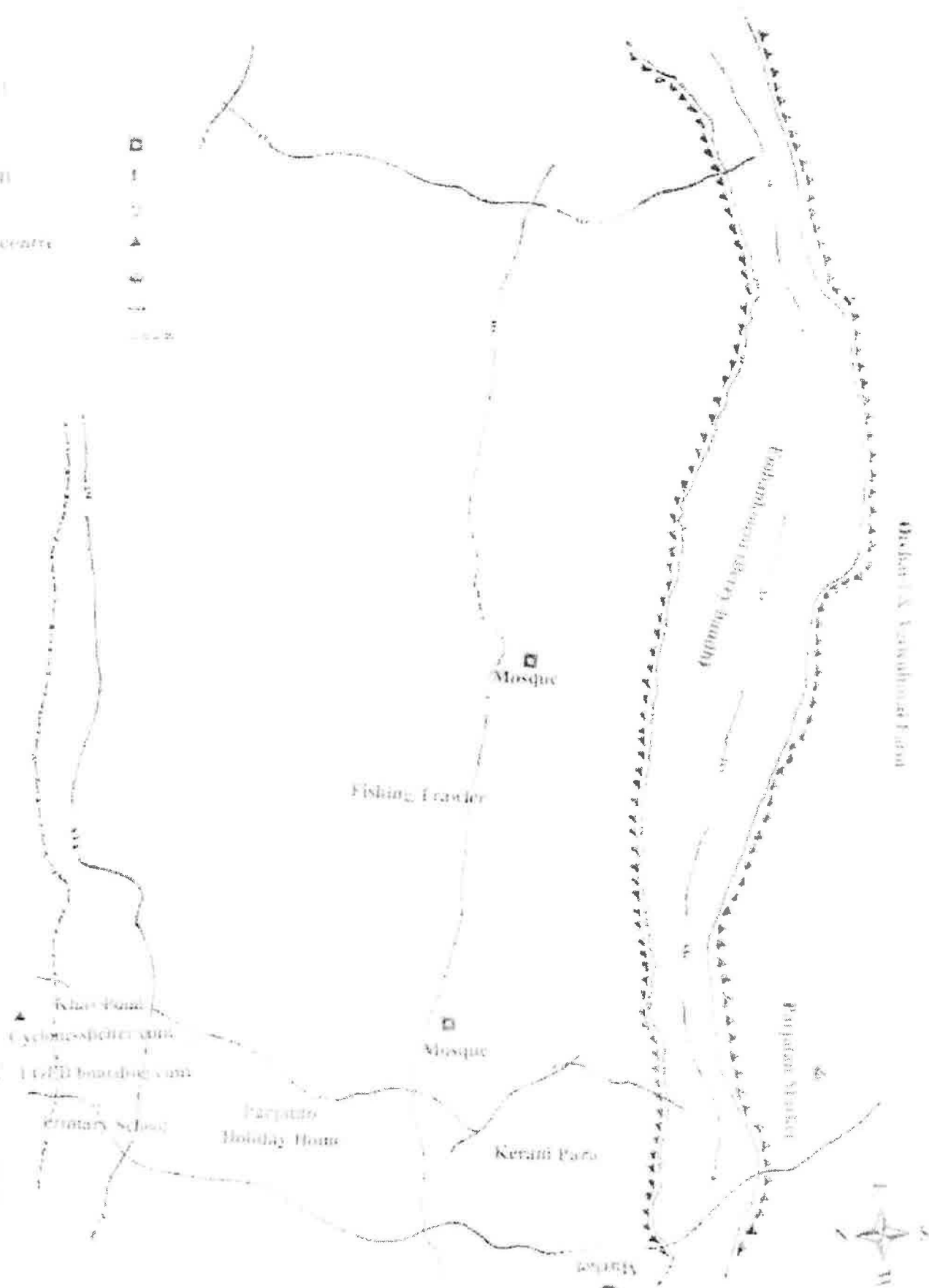
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Map of Kuakata panju para, Patuakhali

- Highway
- Mosque
- Tube well
- School
- Cyclone centre
- Market
- Khan
- River

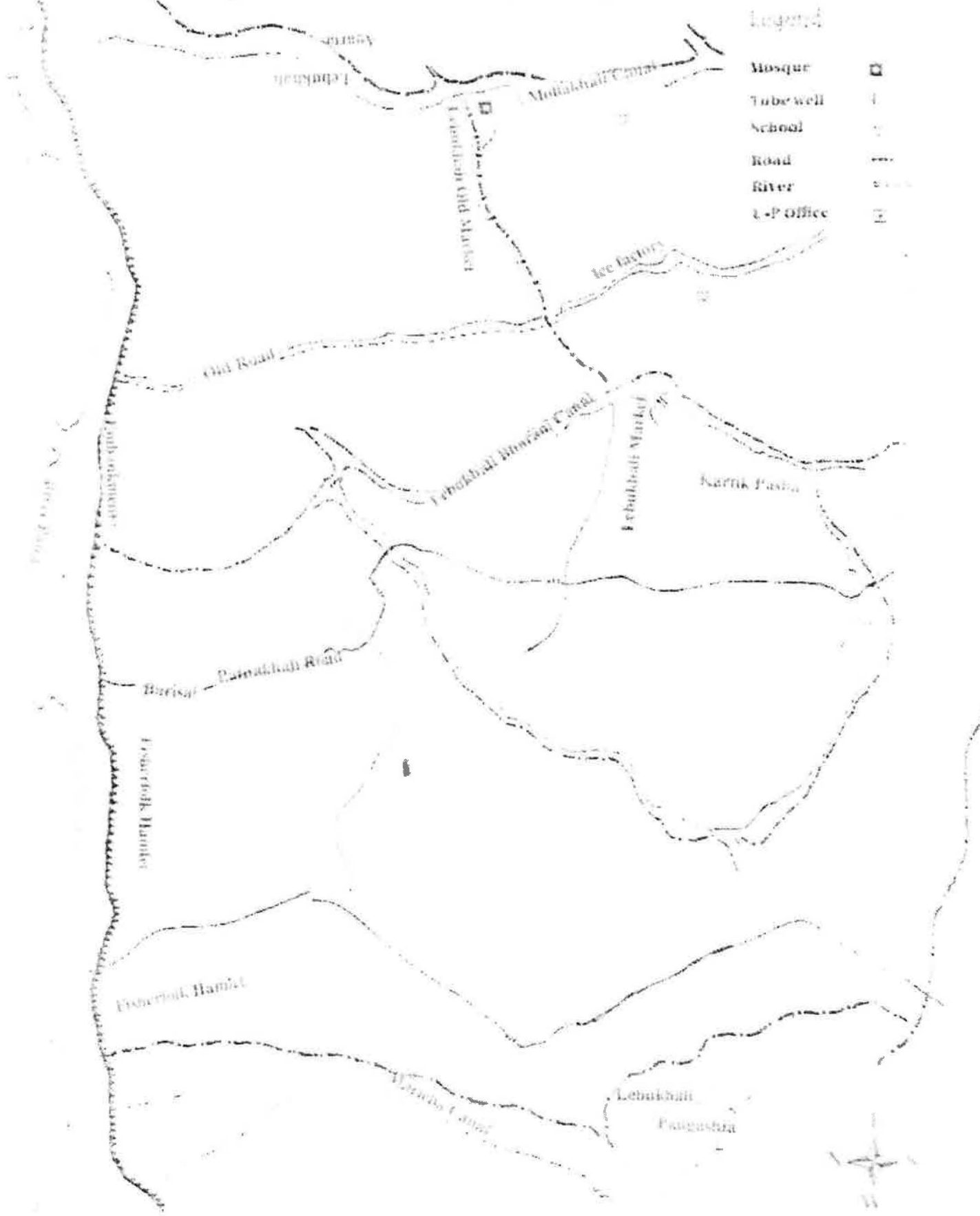
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Dated: 15/10/2004

Scale: 1:50000

Map of Lebukhali, Patuakhali



- Legend
- Hospital
 - Mosque
 - Tube well
 - School
 - Road
 - River
 - L.P. Office



Map of Debraj Bagerhat

Legend

Madrasha

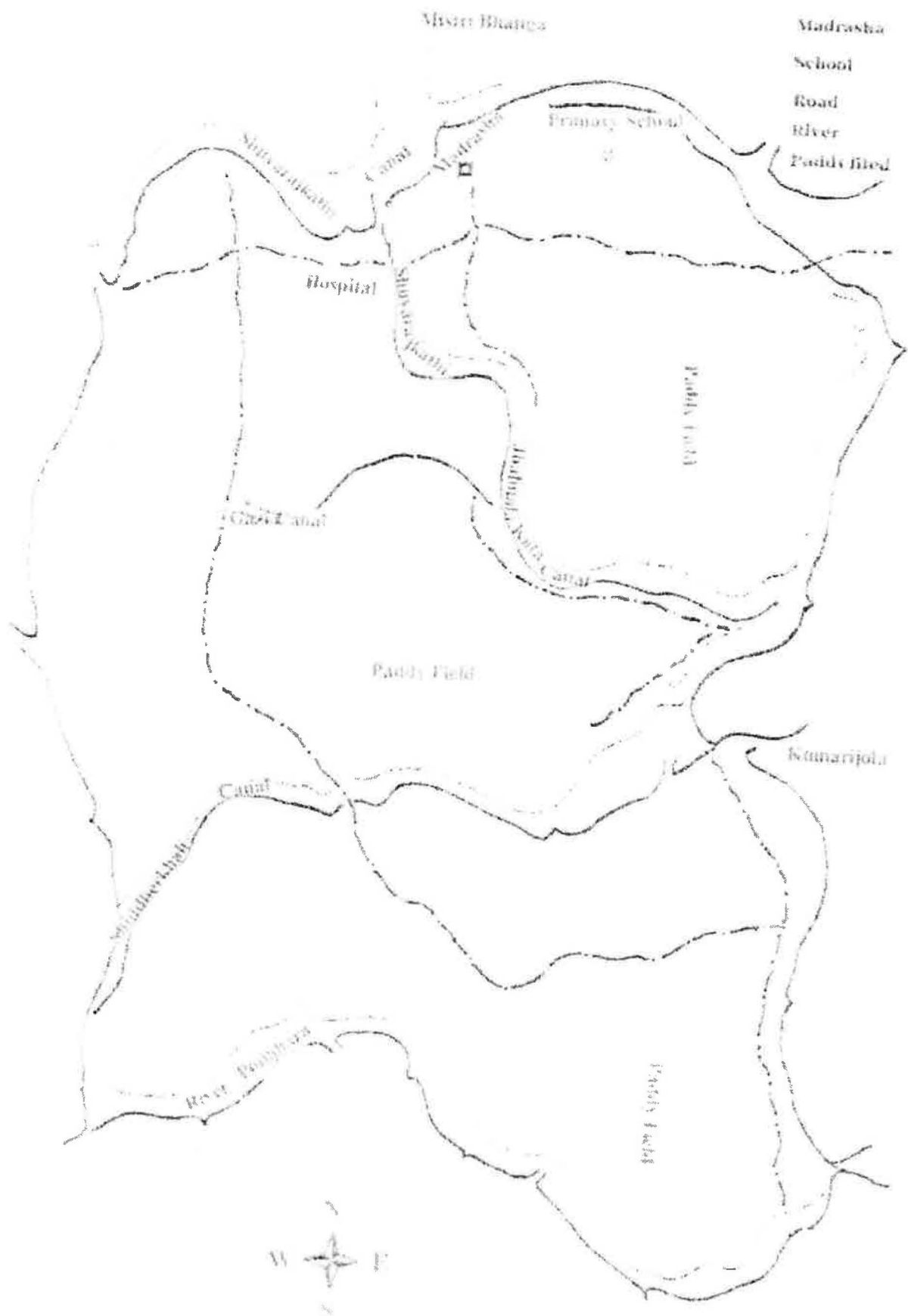
School

Road

River

Paddy field

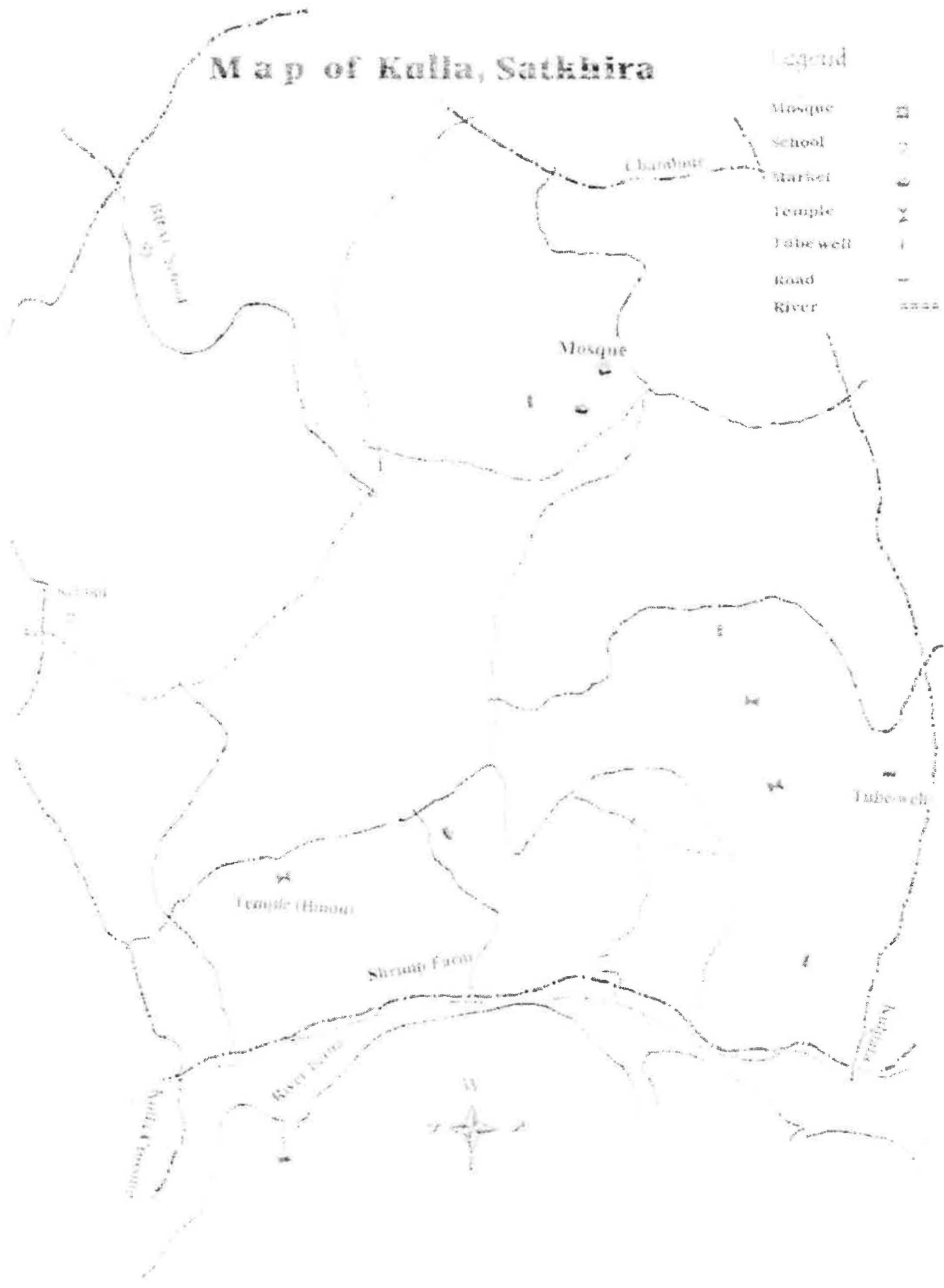
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Map of Kulla, Sathhira

Legend

Mosque	⬢
School	○
Market	⊠
Temple	⊠
Tube well	⊠
Road	—
River	~~~~~





Fish catching, handling and marketing

LIVELIHOODS IN SIX COASTAL FISHING VILLAGES

This chapter presents the findings of Participatory Rural Appraisals in six coastal villages. A livelihoods approach was used focusing on household assets, vulnerability context, and livelihoods outcome. The latter concentrated on an analysis of wealth categories and poverty. More details on the livelihoods approach are presented in the methodology section. The maps presented above should be consulted when reading this chapter.

Setting of the Villages

Latifpur is a Hindu village which is located approximately 20 kms north of Chittagong city next to the Chittagong-Dhaka railway line. It is divided into 3 para's (i.e. hamlets), namely (Latifpur: 57 households (hh), Nayapara: 12hh, Salimpur: 30 hh). The village itself forms part of a larger Muslim dominated community.

Most people work in the fishing sector, and very few households work in non-fishing related occupations. There are about 11 male *paikers* (from separate households) and 10 female *beparies* (also from separate households). Young people have now to take up wage employment outside the village, as fish has declined so much.

Very few people go to school, i.e. only four people have been to school and completed it. Most of the boys go to primary school, but very few complete it and higher education is very rare. There is also a new NGO run school, called Young Power for Social Action (YPSA). It was opened in 2001 and is targeting women and young children. There is a government health centre but drugs are unlikely to be available. For pregnant women there is a maternity ward. Family planning centres are there but extension officers do not come to this village. There is a general lack of sanitation facilities (i.e. not every household has a pit latrine). Drinking water is coming from a tube well, however the actual supply is insufficient. CODEC is the main NGO working in the village on issues such as education, institution building, and credit.

Hatkholapara is divided into 4 paras, namely South Mamothpara (400hh), North Mamothpara (350hh), Imapara (250hh) and Hatkholapara (200hh). Hatkholapara is located along the channel that runs into the Bay of Bengal. Although it is relatively close to Cox's Bazar it has no direct road connection. It can be reached through a ferry and then various transport services such as cycle rickshaws or motorised taxis.

The village is a mixed farming and fishing muslim community. Fishing is carried out for about 10 months per annum in the Bay of Bengal. The village has a landing site nearby but most of the fish is landed at the BFDC terminal in Cox's Bazar. Each para has 2 *samaj* and 2 *sardar* (i.e. traditional leaders) who are elected by the people. They are mainly responsible for the mediation of local conflicts.

Table 5: Setting of the Six PRA Villages

	Latifpur	Hatkholapara	Kuakata Panjupara	Lebukhali	Debraj	Kulla
Administrative Setting: District Upazilla Union	Chittagong Sitakunda Selimpur	Cox's Bazaar Sadar Khurushkul	Paruakhali Kalapara Lata Chapli	Patuakhali Dumki Lebukhali	Bagerhat Morelgonj Panchakaran	Satkhira Ashashuni Kulla
Fishing households (#)	101	110	194	74	170	85
Religious Background	Hindu, next to larger Muslim community	Predominantly Muslim	Predominantly Muslim	Predominantly Muslim	Predominantly Muslim	Predominantly Hindu
Physical Setting	Open access to the Bay of Bengal	Indirect access through river to close-by Bay	Open access to the Bay of Bengal	Riverine Village, access to Bay of Bengal via river Paira	Riverine village, no direct access to Bay of Bengal	Riverine village, no direct access to Bay of Bengal
Type of fishing boats used	Small Motorised Boats, i.e. 10 – 20hp	Medium-sized motorised Boats, up to 70 hp	Mix of small non-motorised and motorised boats	Small dingi boats, non-motorised	Small dingi boats, non-motorised	Small dingi boats, non-motorised

Kuakata Panjupara is a village on the coast open to the Bay of Bengal. It is located just adjacent to the open sea beach. A village of Lata Chapli union under Kalapara upazilla of Patuakhali district, Kuakata is about 30 kilometres away from the upazilla headquarters and 78 kilometres away from the Patuakhali district town. By land route, it is 323 kilometres away from Dhaka city. Kuakata, which is also a growing tourist spot, is a relatively small village inhabited by 198 households with an approximate population of 1,200 people.

It is believed that 40 to 50 years ago this locality was inhabited by the *Rakhaine* people who emigrated from nearby Myanmar. It is said that since they were reluctant to pay tax to the Government they gradually left (tax was introduced in 1952).

Transect walks through Kuakata village bring to the notice of anyone the trees and herbs like date, palm, coconut, gourd, banana, pineapple, raintree and mahogany gardens, sugarcane, *akashmani*, *chambal*, *kalikadam*, *arum* etc. In addition, deep bush is there. *Akashmani* trees are used for furniture. Here the people rear livestock such as goats, buffaloes, etc. The lack of latrines is noticeable. Although there are a relatively high number of paddy fields the soil quality is poor (i.e. sandy). Normally they cultivate aus, aman and irri paddies here. There is one road within the village, which goes to nearby Nabinpur/Dokashipara from the approach of the sea beach through this village.

Lebukhali is located just by the side of the river *Paira* which flows into the Bay of Bengal and is also known for its torrential waves during the monsoon season. A village of Lebukhali union under Dumki upazilla of Patuakhali district, Lebukhali is a few kilometres away from the upazilla headquarters and 16 kilometres away from the Patuakhali district town on the Barisal-Patuakhali main road. By land route, it is 229 kilometres away from the Dhaka city. Earlier, this village used to belong to the Patuakhali Sadar upazilla before establishment of the Dumki upazilla. Lebukhali was known for its *balam* variety of local rice.

At the beginning of the 21st century, Lebukhali has a total population of about 500 households (i.e. about 3,500 to 4,000 people, and 1,700 – 1,800 voters). Before the liberation of the country, the village was inhabited by many Hindus fishermen. They were around 100 Hindu fishing families. After the liberation in 1971, about 98 households migrated due to occurrences of communal disturbances at that period. Some left during the War of Liberation in 1971. Now there are only two Hindu households left who are involved with loom and rope business. They changed their profession for fear that they may not be able to make a living in competition with the Muslim fishermen.

Debraj, which is a riverine village 12 hours from the Bay of Bengal (i.e. by using a 45hp engine boat), has a total population of about 400-450 households and 1,200 voters. 100 of the households are predominantly fishing households, 50 are involved with trading, about 20 with fish processing (i.e. mostly sun-drying of fish in places like *Katkar Char* and *Helat Char* along the coast of the Bay of Bengal). Some of the households migrated to big cities such as Dhaka, Chittagong, and Khulna in search of alternative livelihoods.

There were some Hindu households living in the village during the colonial period, most of whom migrated to India during the Pakistani regime as a result of intrusion by new entrants into their fishing zone. Since the 1960 the Muslims started fishing in the sea and rivers due to landlessness, lack of alternative job opportunities, and the availability of 'common pool resources'. In 2000 there are only two Hindu households left in the village who are into activities such as rope making.

Kulla is an old Hindu village of Kulla union that belongs to Ashashuni upazilla of Satkhira district. At present there are 85 households (HHs) in this fishing hamlet. Before independence (1967-68) there were 150 fishing households, and before 1947 there were 248 fishing households. During 1948 and after 1965 many households

migrated to West Bengal, Orissa, and Madhya Pradesh. Reasons for migration during the Pakistan period included scarcity of fishing grounds and piracy.

The villagers are traditional Hindu fishers and have been involved with fishing for seven generations. Whereas they used to be known as *Rajbongshi*, nowadays they are all known as *jele* (fisher), using different surnames after their names. In 1971, the *rajakars* (local collaborators of Pakistani army) looted their belongings and tortured them. At times, there was starvation. In 1988 (13 Agrahayan, Tuesday) there was a severe cyclonic storm leading to loss of lives, homes, different assets and fishing gears.

Asset Base

The asset base comprises the capital assets that help people survive and thrive. The main capital assets include human, social, natural, physical and financial capital, which are discussed *separately* below. Assets are important in terms of quantity and quality, extent of their control, rights and security of access. This needs to be seen in the context of access to assets by both women and men. Although it is impossible to define a 'minimum' level of assets needed for survival, as the categories are highly subjective and location specific, it is obvious that the better people's overall asset status is, the better they will be able to respond to changes and face hardship.

Human capital

Human capital represents resources such as skills, knowledge, ability to work and good health. Access to a combination of these elements is a prerequisite to be able to make use of any of the other four capital assets. For example, before a fisherman can get a good catch, he needs to know the location of the fishing grounds, how to judge weather conditions, how to operate a boat and how to maintain and produce the necessary fishing equipment such as fishing nets, boats and engines.

In the context of the communities visited during the course of the PRAs, the fisherfolk of Latifpur (Chittagong District) and Kulla (Satkhira District) are well endowed with fishing skills. To a large extent, this is due to their social background, in that they belong to the traditional Hindu fishers caste (i.e. *Jalada*). On the one hand this indigenous knowledge of capture fishing has led to a considerable amount of technical skills to earn a livelihood, on the other hand, due to social and cultural barriers, it also restricts them in their professional choices. For example, in particular the middle-aged and older fishermen in Latifpur village find it difficult to opt for alternative livelihoods despite the proximity of Chittagong, which is Bangladesh's second most important industrial centre. The younger generation in Hindu villages is more open to change, however their main constraints include lack of new skills and capital. It was also stated that sometimes, due to their background, Hindu villagers are discriminated against when applying for alternative jobs.

Compared to the Hindu fishermen, the Muslim fishing communities encountered in Cox's Bazaar, Patuakhali, and Bagerhat Districts, have only relatively recently entered this type of business. Reasons include loss of their traditional livelihoods such as agriculture (i.e. due to loss of land, etc) or weaving (i.e. due to profound changes in this industry). Nevertheless, despite the late entry into this business,

Muslim fisherfolk have acquired a reasonable amount of knowledge to work as fishermen and fish processors. At the same time, since they are not only specialised in fishing, they are also in a position to opt for alternative employments such as cultivation, petty trading, rickshaw / van pulling, and shop keeping.

Most of the members of the coastal communities in all the six villages lack the minimum primary education for enhancement of their livelihood skills. There are some Government primary schools now-a-days in different villages but in most of the cases those are far away from the villages surveyed. For example, in Lebukhali it was reported that the children had to walk a long distance to the school. This poses a problem during the monsoon season, when the children have to take boat transport which is expensive and sometimes hazardous.

At the same time, interventions for Children Education and Adult Literacy by the NGOs have been found to take place in the study villages of Chittagong, Patuakhali and Satkhira districts; although in a limited scale to the members of their (NGOs) supported village organisations. There are no NGO interventions in the survey villages located in Bagerhat and Cox Bazaar Districts. Asked about the government sponsored adult literacy programme, named "Total Literacy Movement" (TLM) among the poor people of all the six coastal villages, the participants in the PRA sessions in all the locations expressed their sceptical views about it, since they see virtually no positive support on education, and other government services such as health, agriculture, livestock, fishery, embankment building/reconstruction etc from the upazilla administrations.

The poor health and inadequate nutrition of the children, women and old-aged members of coastal communities also inhibits their development. The overcrowding, poor sanitary condition (lack of adequate water-sealed latrines) and inadequate access to safe drinking water make their human assets, and consequently the livelihoods, more vulnerable.

The labour power of the coastal communities is considered to be their most important asset. However, most of the women members of the coastal communities remain unemployed from any income generation activities. Only a few women of the Chittagong village (Latifpur) are involved in fish vending and a few women of Kuakata Panjupara of Patuakhali are involved in shrimp-seeds collection. A few women of Kuakata and Hatkholapara (Cox's Bazaar) were also found to be employed in dry fish processing activities and net making / mending as part time wage labourers. On the other hand, the child labour in the agricultural fields and shrimp-seed collection activities may be considered as a negative aspect of their livelihood strategies, since the children in such activities are deprived of proper education and nutrition. While acknowledging this proposition in the PRA sessions, the poor participants commented that they are forced to utilise their children as assets due to their abject poverty.

Table 6: Household Asset Base

	Latifpur	Hatkholapara	Kuakata Panjupara	Lebukhali	Debraj	Kulla
Human Capital	Good fishing skills, since villagers belong to Hindu fishers caste; low level of education; There is an NGO school for adults and children;	Medium fishing skills due to relatively late entry into this business; Villagers are also familiar with agriculture;	Medium Fishing skills; Good fish processing skills by group of young villagers; There is NGO school for adults and children	Low to medium fishing skills due to late entry into fishing business; Limited exposure to sea fishing; Weaving used to be common; NGO school for children and adults.	Low to medium fishing skills due to late entry into fishing business; Limited exposure to sea fishing; There is no NGO school.	Good fishing skills, since villagers belong to fishers caste; Limited exposure to sea fishing; There is NGO school for adults and children
Social Capital	NGO supported village organisation Also, there is CODEC supported fisherfolk organisation	There is boat owners association, crew members don't have access	NGO supported village organisation Also, there is CODEC supported fisherfolk organisation	NGO supported village organisation	No NGO supported village organisation One CBO in the form of Maitshyibi Samaby Samity	NGO supported village organisation
Natural Capital	Access to the open sea, Very little landownership (only 10%)	Access to the Bay of Bengal, Some villagers own land	Access to the Bay of Bengal, Some villagers own land, others live on khas land	Access to River Paira, Some villagers own land, erosion is a big problem.	Access to River Poilahara, Some villagers own land, however, erosion is a big problem	Access to River Betna, very little land ownership, Shrimp gherms use land
Physical Capital	Small engine boats and nets, Major Chtg – Dhaka road is close by	Medium sized engine boats (40 – 70 hp), also collector boats; Different types of nets (e.g. MSBN	Small motorised and non-motorised boats; Medium road access	Dingi boats, non-motorised; nets for river fishing; Patuakhali – Barisal road is close-by	Dingi boats, non-motorised; nets for river fishing; bad road access	Dingi boats, non-motorised; Nets for river fishing; Bad road access
Financial Capital	Only CODEC is present in this village, providing micro-finance and 'dadon-free loans' for fishermen	No micro-finance NGOs in this village	NGOs such as CODEC and Grameen Bank operate in this area	Several NGOs operate here, i.e. Grameen Bank BRAC ASA Polli Sheba	No micro-finance NGOs in this village	No micro-finance NGOs in this village

Social capital

People are dependent on social resources in pursuing their livelihood strategies. Social resources are determined by relationships and networks, which exist within nuclear and extended families, and in and among communities and groups. These social relations influence the way in which people can access and make use of their assets. Social relations are often based on trust, reciprocity and exchange, and contribute to a sense of well being and belonging. Such informal social relations form the basis of informal safety nets, which people use to pursue their livelihood strategies in times of problems and emergencies.

No indigenous social organisations of the fisherfolk were encountered in the six villages, other than the ornamental *shamaj* entities. However, the NGO interventions in the four villages of Chittagong, Patuakhali and Satkhira led to the formation of village organisations comprising the members supported by the NGOs. However, among the four villages, genuine fisherfolk organisations only exist in Latifpur (Chittagong) and Kuakata Panjupara (Patuakhali) where CODEC (Community Development Centre) has its interventions for the fisherfolk communities. These organisations, supported by the NGOs, pave the way towards social, economic and political empowerment of the coastal communities.

As for the *shamaj* organisations, for example in Hatkholapara there is a boat owner association, the membership of which is reserved for boat owners only. Crew members cannot join the association. About 20% of the households have their own boats but not all of them are a member of this association, the mandate of which is to solve conflicts and fix loans for crew members. This raises the issue that only the better-off in the fishing community are organised whereas the poorer members are not.

On several occasions, it has been reported that in the past village associations have suffered from embezzlement of funds by association leaders. This points to the importance of reestablishment of trust and transparency when introducing new types of village organisations.

Natural Capital

Natural capital is the quality and quantity of natural resources that are available to people and above all, the access and control people have over these natural resources. Examples include aquatic resources, water, land, forests, air quality and biodiversity. These resources often form the basis of most rural economies.

People living in coastal fishing communities, not only depend on fish but on a combination of natural resources for pursuing their livelihoods. For example, fish is caught for both household consumption and sale, generating a cash income. Waterways are also used for transport of persons and produce. Fresh water is used for human consumption and for preserving fish (e.g. production of ice). Forests provide both building materials for housing and boats but also fuel wood for cooking and smoking fish. Access to land can be important, especially if fishing is a seasonal

activity, because agricultural activities can supplement the household food requirements.

The major source of natural asset or capital to the coastal poor of Latifpur (Chittagong), Hatkholapara (Cox's Bazaar) and Kuakata Panjupara (Patuakhali) villages is the **Bay of Bengal** and it (natural asset) is the river **Paira** to the Lebukhali (Patuakhali) fishers, river **Poilahara** to the Debraj (Bagerhat) fishers and river **Betna** to the Kulla (Satkhira) fishers.

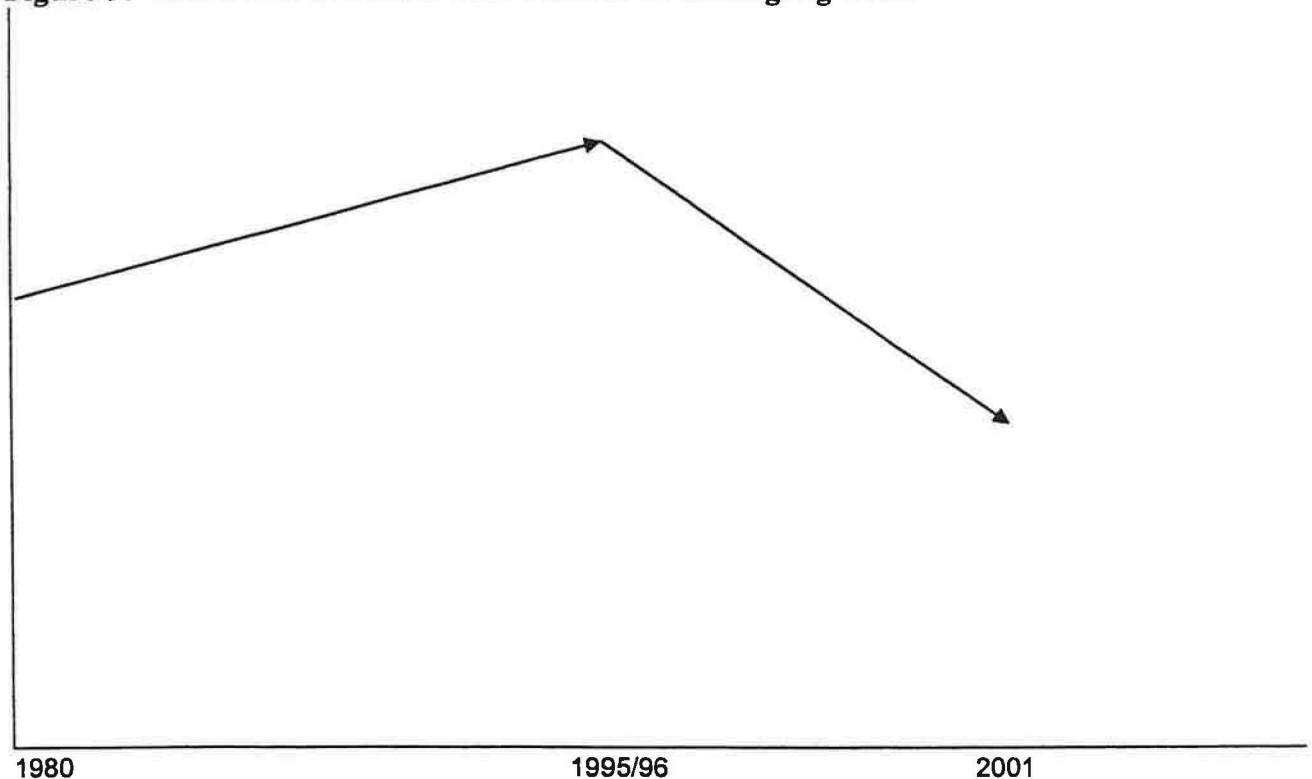
Some villagers own land for crop production, the size of which can vary considerably within and between the villages. In particular, landownership is very limited in the Hindu fishing communities. In the other villages there is a substantial variation between the better-off (i.e. more than 10 acres) and those with little or no land. **Sea and river bank erosion** is a serious problem encountered in the majority of villages. It has led to the destruction of numerous livelihoods in the villages, in that either the homesteads have disappeared or agricultural land was swept away.

To a very limited scale, the *khas* lands (government owned) and embankments provide a living space for the poor people of all those villages. Some other canals and ditches in the vicinity of the villages are also the sources of livelihoods for the poor people. The ecosystem and biological diversity of these open-access resources provide substantial opportunity for livelihood security for the poor people of these coastal villages. However, these open-access resources attract a large number of poor people as a '*sink*', leading to overexploitation of these resources. This in turn seriously endangers the long-term livelihood security of the coastal poor.

It has been revealed from the PRA sessions in the fishing villages and also from the rapid market appraisals that there is an ongoing process of marine resources depletion, which is represented by 'reduced catch per unit effort' and an overall reduction of marine fish supplies in the market. The trend line drawn by Latifpur fishermen (Figure 1) best illustrates how fish catches have risen between the 1970s and the early 1990s. In particular, this was due to the use of more efficient gear such as engine boats and gill nets. In some cases (e.g. Latifpur), the use of these techniques and the associated knowledge was introduced by newcomers to the area who had to leave their original home villages due to loss of livelihoods.

In all the six fishing villages it was reported that the marine fish catches have started to decline since the early 1990s. At the same time it was also indicated that this decline is not linear and that there are years which are better than the previous ones (e.g. in most villages the 2001 *hilsha* season was considered to be better than the one of 2000).

Figure 3: Trend line of Marine Fish Catches on Chittagong Coast



Causes of fish stock decline indicated:

Fry & Juvenile catch, Accretion of land under the sea, Waste disposal from fertilizer factory, Garbage from the city (Polythene), Disposal from ship breaking industry, Increased number of boats, Throwing of trash-fish into the sea by the big commercial trawlers, Use of current net Use of insecticides & chemicals in agriculture, Environmental damage from gas exploration, Explosion in the sea by army.

Source: PRA Exercise with fishermen in Latifpur village in July 2001;

The declining fish catches are not only felt in smaller quantities caught but also in reduced quality in that fish is becoming smaller. For example it was reported that the average weight of *hilsha* caught five to ten years ago was much higher compared to nowadays (i.e. more than double according to fishermen and traders).

In summary, the participants in the PRA sessions assigned the following reasons for resource depletion in the sea and river, which leads to “reduced catch per unit effort” and overall decline of supply in the long term:

- Increasing numbers of people are engaged in fishing with different types of nets. Number of nets per fisher also increased to a substantial extent.
- Big commercial trawlers indiscriminately fish in the sea and throw large amounts of unwanted fish (they consider these as trash fish) in the sea. As the trash fish are already dead, this process destroys the fish habitat. At the same time, one chief executive of a leading commercial fish exporting company of the country recently reported in a meeting in Chittagong that during the last few years their commercial trawlers have not been throwing “trash fish” into the sea because, nowadays, all the species of fish are commercially worthy for them.

- Sometimes the big commercial trawlers fish in the artisanal fishers' fishing zone (less than 40 metres depth), which they are not allowed to do in accordance with the 'rules' they should follow or the permission they got for using fishing grounds.
- The Thai and Indian trawlers are involved with theft fishing in the zone of Bangladesh.
- Oil-discharge in the sea by the scrap-vessels of the ship-breaking industry destroys fish habitat. The floating oil on a large area of seawater inhibits sunlight to get into the water that is required for the fertilisation of eggs. However, this proposition could not be ascertained or investigated in more detail.
- Discharge from factories like chemicals, fertilizer, tannery etc. destroys fish habitat.
- Discharge of chemical fertilizers and pesticides into the sea and rivers from the agricultural fields along with monsoon water.
- The fishers of Chittagong village complained that the recently built Shangu Gas Field (exploring gas from the sea) near to the village affects adversely their fishing by destroying fish habitat. However, they could not properly explain how.
- To cope with the situation of gradual non-availability of fish in the near shore, fishing has been mechanised. Most of the fishing crafts are motorised. So, fish habitat moves further away.
- Overexploitation of resources like catch of juvenile fishes (juveniles of *Hilsha* are locally termed as *jatka*, catch of which is banned) with rampant use of monofilament net (locally known as *current jaal* – weaving, sale and use of which are already banned) and estuarine set-bag net (ESBN, which are going to be banned and are now being discouraged by the Department of Fisheries) also depletes the stock.
- The unskilled process and act of shrimp-seed collection from the sea destroys a huge amount of different fish species, which is a potential source of fish depletion.

Table 7 provides an overview of how fishermen along the Chittagong Coast view the decline of fisheries resources by species.

Table 7: Marine Fish Species which are Becoming Rare or Are Disappearing

Species getting very thin catches	Species which have almost disappeared
Shrimps (chikka), Sharks, Stingray (shaplapata), jew-fish (popa), Crabs etc.	Bhoal, Lukkya, big Korol, Faishya (like anchovy), Chapila, Risshya, Sundari-bele, Tiger Shrimps (red), Pungash, Ribbon (Chhuri), jew (white) Chandana <i>Hilsha</i> , Sundari (knata), Gnhora, Kata, Chewa, Cherpati (salt fish), Maittya, Ram Chokkhya, Guldya, Bnata, Khoral, Kawoon, Datina, Datina Bhoal, Pomfret (Rupchanda), Bengya, Bhoal (very big), Korati, Lobster (big)

Source: PRA in Latifpur, April 2002

Physical Assets

Physical capital is the basic infrastructure such as transport, shelter, sanitation, water, energy and communications, and the production equipment and means which enables people to pursue their livelihoods. It includes public goods such as health care, cyclone shelters, and infrastructure such as roads, for which people often do not have to pay directly or contribute partly (e.g. payment of school or hospital fees). Having good access to infrastructure can be especially important for traders as it increases their potential marketing area. Access to health services, safe water supply and sanitation will have a positive contribution to people's health, thereby increasing people's human capital and ability to work.

Also, private owned physical assets such as fishing gear, boats, engines, fishing nets, fish processing equipment (ice boxes, smoking ovens, drying racks/slabs) and modes of transport are crucial to support livelihood strategies.

As outlined in Table 8, there is a wide range of mechanised and non-mechanised boats available in the villages. This ranges from small dingi boats without engine, which are used on rivers by two or three crew, up to wooden trawlers, which are powered by 40 – 70hp engines and run by up to 20 crew members. The investment cost of these types of equipment varies considerably.

Table 8: Investment Costs of Fishing Boats

Type of Boats	Investment Costs
Small <i>dingi</i> (i.e. country) boat	Tk2,500 – 5,000
Small motorised boat with 15 – 20hp engine (including boat, engine, and nets)	Tk60,000 – 80,000
Wooden trawler (50 – 70hp) to fish in the deep-sea:	
Boat, incl. engine	Tk6,00,000 – 7,00,000
Nets	Tk4,00,000
Working capital	Tk1,00,000 – 2,00,000

A variety of nets and other gear are used to capture marine fish. This includes:

- Gillnet, mostly used for larger *hilsha*,
- MSBN (Marine Set Bag Net)
- ESN (Estuarine Set Bag Net), mostly used for species such as bombay duck in the lean season
- Beach-seine net (*i.e. ber jaal*), for catching of tapshi, faishya, poma, etc.
- Current net (*i.e. monofilament net*) used for jatka catching (juvenile *hilsha*)
- Push / pull net, used for shrimp fry collection
- Longline and hooks (*i.e. moiya, borshi*) used for catching species such as *poma, rita, ramchosa, ayer boal, pangash*, etc

Although the marketing surveys have identified that transport between major urban centres tends to be relatively fast and inexpensive, it was stated that **road communication** is inadequate in the majority of coastal villages. Most of the roads

are non-bricked and non-metalled. The few semi-metalled roads in Chittagong, Cox's Bazaar and Patuakhali villages are in bad shape and need repair.

The muddy roads of the villages are virtually inaccessible for the rickshaws, vans and motorised vehicles. This limits transportation of the catches, crops and other goods of the shops to the required market places.

The villages which are located in the vicinity to major roads such as Latifpur (e.g. close to Chittagong – Dhaka Road), or Lebukhali (e.g. close to Patuakhali – Barisal Road) are in a better position in that they have easier access to the main markets. Nevertheless, the connection between the villages and the main roads would benefit from improvement. For example, it was reported that the children cannot go by foot to the school during the monsoon months, as a result of which they rely on expensive and unreliable boat services. In particular, girls have been reported to be affected by the lack of inadequate access to schools.

Although improvements have taken place as far as the availability of river ferries and bridges is concerned, there can still be undue delays when using road transport. In particular, on certain major connections (e.g. Patuakhali to Barisal), several large rivers need to be crossed. Needless to say, that during the main monsoon season river crossings tend to be more dangerous and time consuming.

Ice factories only exist in the urban centres, where there is electricity supply (e.g. Chittagong, Cox Bazaar, Patuakhali, Barguna, Mohipur). Fishermen who have access to ice acknowledge improvements over the last ten years (e.g. Latifpur, Kuakata), although they might complain about soaring ice prices during the peak fishing season. Ice manufacturers complain about unreliable electricity supplies. At the same time, there are places which are nowadays oversupplied with ice plants (e.g. Mohipur / Alipur in Patuakhali District).⁶ Less fish tends to be processed in areas where the availability of ice has increased.

In general the minimum **health facilities** required for the coastal poor in the six study villages are very poor. There are no government hospitals or health centres near the villages of the six locations. In Latifpur, an NGO provides elementary health services, to some extent, through its field hospital in the vicinity of the village. There is virtual absence of required immunisation support for the mothers and children in the study villages from the side of the government. The NGOs active in the area periodically undertake such activities, whenever they can arrange.

Tube wells or fresh water bodies for safe drinking water are also inadequate in the coastal villages. Central or local government initiatives are lacking in this respect. The NGOs working in the communities have installed some tube wells in the vicinity of their members' residences. There is also a reported problem of arsenic for the tube wells in some fishing villages, especially in Satkhira.

⁶ This aspect will be dealt with in more detail in connection with marketing and other post-harvest operations.

The **housing facilities** of the poor coastal communities in the study villages are very poor due to meagre income and overcrowding. The frequent cyclones and floods often destroy their houses along with other livelihood assets.

The lack of adequate **cyclone shelters** in the vicinity of the coastal villages also seriously affects the lives and livelihoods of the communities. For example, the participants in the PRA sessions in Kuakata Panjupara, Patuakhali complained that the only cyclone shelter in the village is now being used as the rest house of the LGED (Local Government Engineering Department) officials.

Financial assets

Financial capital refers to the financial resources which are available to people (e.g. cash, savings, credit, remittances) and which provide them with different livelihood options. It also includes illiquid resources that can be quickly converted into cash and more liquid means. In some societies, there is a preference for saving in kind as that is perceived as having a higher value or being less risky than cash. Examples are jewellery (gold) and cattle, which is often disposed of in case of emergencies such as illness, marriage or death.

Financial capital is a very versatile type of asset in that it can be used to acquire other types of capital such as, natural capital (e.g. land), physical capital (e.g. fishing equipment), or human capital (e.g. education or vocational training). In addition, financial capital can also improve one's social capital as a high socio-economic status often correlates with having power and being respected/feared by others

The main sources of financial capital for the poor people of the six villages are the informal credit market and the quasi-formal credit market. The chief actors of the informal credit markets are the *dadandars* and the moneylenders, while the NGOs are considered as the actors of quasi-formal credit market. Their access to the formal credit market (i.e. scheduled banks) is virtually inexistent due to their lack of bankable assets.

The source of finance for fishing in the coastal villages, especially in Chittagong, is principally the *dadan* and usury market. In the usury market, the moneylenders generally lend money at an interest rate of 120-240% per annum. On the other hand, *dadan* is a sort of monopsony transaction built upon an uneven lending contract (often verbal), even before production, in favour of the lender/purchaser of produce to sell the produce to him/her at a price much below (i.e. usually about 20% - 40%) the normal market price, or against a certain percentage of commission (e.g. 5% to 10% of sales revenue, or Tk. 5 – 10 per Kg of fish). Most of the fishermen resort to the *dadandars* for finance, as a consequence they have to hand-over all their catches to the *dadandars* (i.e. particularly in Chittagong). Sometimes, they (i.e. Chittagong fishers) do not even get the revenue or know the price of their fish on the day of catch and sale. The *dadandars* fix the prices after sale of the fishes in the wholesale market far away from the village.

However, in Cox's Bazaar, Patuakhali, Bagerhat and Satkhira villages the *dadandars* are mainly commission agents. The fishers have to sell their catches to the buyers (*paikers*) through the shops/warehouses (*arat*) of *dadandars*, and the *dadanders* reap

5%-10% commission on the revenue from the fishers. The rate of usury interest is also less (i.e. generally about 120% per annum) in these five other locations compared to that of Chittagong.

In contrary to the informal sector, the NGOs (e.g. BRAC, Proshika, CODEC, ASA, Grameen Bank etc.) provide loans only to their organised poor members and offer the subsequent loan only after repayment of the former one, whereas the *dadandars* advance money even before non-realisation of the previous amount. Some of the participants in the PRA sessions commented that the amount of finance being provided by the NGOs is insufficient and this amount does not commensurate to the poor people's actual need.

However, in the Chittagong village (i.e. Latifpur) CODEC has introduced a new product of finance called **Dadan-free Loan** (i.e. usury debt redemption loan) to free the fishers of CODEC supported Village Organisations (VO) from the clutches of *dadan* and usury market. CODEC also introduced this Dadan-free Loan product in other fishing villages along the coastline of Chittagong. To this end, after proper assessment and verification, they (CODEC) repaid the *dadan* and/or usury loan to the respective *dadandars* and/or moneylenders directly in presence of the borrowers and also advanced the required amount of working capital to the respective fishers of the CODEC-supported VO. In this way, CODEC has provided *Dadan-free Loan* up to Tk.75,000 to a single fisherman. By mid 2002, CODEC had provided such type of long-term loans (payable within 3 years) to 110 fishing households, belonging to several surrounding fishing villages, on a pilot basis. The introduction of this new loan product led to a significant reduction in *dadan* dependence. However, a few fishers could not repay the loans in time due to piracy of their catches and fishing gears in the sea.

Although the *dadandars* and the moneylenders are the chief sources of finance for the poor stakeholders, it is often argued that the conditions involved (e.g. high interest, or interlocked transactions leading to low prices) marginalizes the fishers to a large extent, and almost all of the fishing households are enchained with *dadan* and/or usury transactions. Besides, the incidences of *dadan* are also prevalent among the shrimp-seed collectors and peasants, whereas borrowing from the moneylenders exists among the shopkeepers.

It has been observed that the informal credit rates are lower in areas where there is a strong presence of NGOs (e.g. Lebukhali). There, the informal credit rates tend to be of the order of 10% per month, whereas they can be as high as 15 – 20% per month in villages with a lower NGO presence.

The relationships between communities may also influence the interest rates. For example, it has been observed that moneylenders belonging to the majority group are likely to charge members of a minority community higher interest rates.

The issue of financial capital will be dealt with in more detail below in the sections on credit access and marketing.

The Vulnerability Context of the Poor

Following an analysis of people's strengths and access to assets, it is important to understand the vulnerability context in which these assets exist. This revolves around the question of what are the external factors that influence the levels of assets and how these assets can be used? These external factors are often related to causes of poverty, which makes poor people, in particular, vulnerable. For many poor rural people, changes in natural capital can particularly affect their vulnerability, as they are heavily dependent on natural resources. Three major types of external factors can be recognised: **trends, shocks and seasonality**.

In many villages a major long-term negative **trend** has been observed in relation to the quantity and quality of natural resources available. For example, over the past decades, fish resources have declined and particular species have become extinct or are prone to extinction. The loss in biodiversity may have negative drawbacks on the remaining resources as the marine ecosystem has been disturbed. The underlying causes for the increased pressure on natural resources are rather complex, but two important ones are a rapid population growth and urbanisation.

Other, institutional related, trends include liberalisation of trade, introduction or lifting of trade bans, and change in consumer preferences. For example, the demand for fresh fish has increased significantly, stimulating the use of preservation technologies such as the introduction of ice. This may have a negative impact on the livelihoods of small-scale fish processors who rely on traditional low cost preservation technologies such as sun drying, salting and smoking of fish.

Shocks are unpredictable events affecting livelihoods such as war, natural disasters such as floods, droughts, cyclones, earth quakes, land slides, disease epidemics and sudden economic changes e.g. currency devaluation. In the fishery context, cyclones and floods have a devastating effect on people's lives and properties. Many lives are lost (loss in human capital), and physical infrastructure and assets are wiped out, such as loss of fishing gear, roads, bridges and transport linkages being washed away, thereby again limiting access to health and education services and employment opportunities in other sectors. According to Haque and Blowfield (1997), "coastal fishing communities are more susceptible to weather conditions than many farming communities. Not only is the size of the catch affected by the weather, rain and storms prevent artisanal fisherfolk from setting out to sea."

Seasonality includes recurrent changes throughout the year that influence people's access to assets and livelihood outcomes. Seasonal change in weather is such an example. The major fishing season may occur during the rainy season, thereby limiting the cash income to a relatively short period per year, imposing a strain on the household cash flow and household food security during the lean season. Transport of fresh fish might be more unreliable in the rainy season as roads may become flooded. Other aspects of seasonality include fluctuations in prices, marketing opportunities, health (e.g. higher risk of malaria during the rainy season) and availability of alternative employment opportunities.

In sum, if people are unable to deal with these trends, shocks and/or seasonal changes, they will become increasingly vulnerable. It is important to keep in mind that the

vulnerability context can differ among the different social groups as the levels of vulnerability is related to their individual combination of assets available and accessibility to them. The vulnerability context can best be explored through an examination of perceived risk factors, key problems, changes, potential solutions and the coping strategies that people have developed. Policy interventions may be required to prevent people from becoming more vulnerable and therefore unable to cope with shocks, trends and seasonal changes.

Survey Results

As is demonstrated in Table 9, the survey results regarding the vulnerability context of poor households in fishing communities of coastal Bangladesh are remarkably similar.

Shocks. All the six villages under study are prone to frequent **cyclones and floods**. Especially, Latifpur (Chittagong), Hatkholapara (Cox's Bazaar) and Kuakata Panjupara (Patuakhali) are quite open to the sea. Besides the storms and floods in almost every year, the devastating cyclones (accompanied by tidal surge) of 1964, 1970 and 1991 caused severe damage to the lives and livelihoods of the villagers of the six locations along with most of the coastal areas of Bangladesh. In 1997 the Chittagong, Cox's Bazaar and Patuakhali villages were again hit by a severe cyclone accompanied by floodwaters, which made many of the villagers homeless with consequent loss of their assets. In addition to that, along with a large part of Bangladesh, the villages of Patuakhali, Satkhira and Bagerhat were also severely affected by the prolonged flood of 1998. The coastal people of Chittagong were also affected in 1988, because their catches of fish, vegetables, crops etc. could not be delivered to Dhaka and many other districts because of blockade of roads and communications for a long period due to the flood. The Satkhira village again came under flood attack in the year 2000. Moreover, the unusual high tides in the Bay often damage the houses and other resources of the poor of Chittagong, Cox's Bazaar and Patuakhali, who live near the seashore or embankments.

Besides the cyclones and floods, like many other people of Bangladesh, the livelihoods of the coastal poor are being affected by the frequent *hartals* (closure of normal activities and transportation due to call of general strike) and other political unrest like road blockade etc. During these days, the perishable products like fish and vegetables get damaged and the poor people have to sell those at a very cheap price, sometimes even failing to get any revenue of their products due to decomposition of those. The rickshaw pullers, shopkeepers and petty traders also face loss during these days for obvious reasons.

Besides the above, another kind of shock is **piracy** in the sea and on the rivers that seriously affects the livelihoods of the poor fishers. Compared to the past, it has been stated by numerous fishermen and traders that piracy has seen a rapid increase in recent years. In particular, piracy is very rampant in the Chittagong, Cox's Bazaar and Patuakhali coasts, and almost daily the fishers along this coastline are facing the act of piracy of their fishing gears and catches in the sea. Later on, Chittagong fishers again buy their snatched fishing gears from the pirates near the big fish-landing station in the Chittagong city. Piracy also takes place occasionally in the Betna and Poilahara rivers along the Satkhira and Bagerhat villages respectively.

Table 9: Shocks, Trends, and Seasonality in Coastal Fishing Communities

	Latifpur	Hatkholapara	Kuakata Panjupara	Lebukhali	Debraj	Kulla
Shocks	Cyclones and floods, 1964, 1970, 1988, 1991, 1997 Piracy in the sea Hartals	Cyclones and floods 1964, 1970, 1988, 1991, 1997 Piracy in the sea Hartals	Cyclones and floods 1964, 1970, 1988, 1991, 1997 Piracy in the sea Hartals	Cyclones and floods 1964, 1970, 1988, 1991, 1998 Piracy on the river Hartals	Cyclones and floods 1964, 1970, 1988, 1991, 1998 Piracy on the river Hartals	Cyclones and floods 1964, 1970, 1988, 1991, 1998, 2000 Piracy on the river Hartals
Trends	Declining fish stocks Land erosion by the sea	Declining fish stocks Land erosion by the sea	Declining fish stocks Land erosion by the sea	Declining fish stocks Land erosion by the river	Declining fish stocks Land erosion by the river	Declining fish stocks Land erosion by the river Declining forest resources
Seasonality (fishing)	Main <i>hilsha</i> fishing season: July to November; other fish (SBN) mainly from Oct. to March; shrimp fry collection Dec to June.	Main <i>hilsha</i> fishing season: July to Nov; Other fish from Dec. to April. Shrimp fry collection mainly from April to August.	Main <i>hilsha</i> fishing season: April to September; Other fish including fish drying from Oct. to April.	Main <i>hilsha</i> season from May to Oct.; jatka (small <i>hilsha</i>) mainly from Aug. to Oct. Shrimp from Oct. to March; other fish Feb. to July	Main season for bagda and chali shrimp from June to Sept. and main season for harina shrimp from Sept. to Dec.	Main ESNB season (chali etc): mainly June to Nov.; Charpata net (tengra, golda) mainly from Oct to Jan; Bachari net mainly from Oct. – Jan.;

The participants complained about the piracy in all the PRA sessions in the six locations. In Chittagong and Cox's Bazaar, the discussions took a substantial amount of time on this issue. In recent years, the local and daily newspapers also published several reports of piracy in the Bay of Bengal. In addition, theft of livestock and poultry is also prevalent in the villages.

Another kind of shock is **accident** in the sea/river and road. In almost every year there are reports of accidents in the sea/river due to which the poor either lose their lives or limbs. It was also reported that fisherfolk operating on the rivers surrounded by forests in the Sunderbans are frequently attacked by tigers.

Trends. There is a high degree of resource depletion, erosion and environmental degradation in all the six study villages. This trend of increasing vulnerability has been coupled with some other trends like sea level rise, increasing population, resource conflicts, technology change and incidences of diseases in those coastal areas.

In all the six study villages, and the coastal area of Bangladesh as a whole, depletion of marine and riverine resources like fish poses a serious threat to people's long-term livelihoods. For example, *Hilsha* fishing is a major seasonal source of income in the four villages of Chittagong, Cox's Bazaar & Patuakhali, and Bangladesh as a whole. However, since the mid 1990s the catch of *Hilsha* is declining at an increasing rate.

In the initial 2 months (June – July) of the *Hilsha* season, there is virtually a very meagre amount of catches. In most of the daily fishing trips during these months, the poor fishers fail to get any substantial catch. They complained that, during these days, they are wasting a lot of their fuel and other costs along with their labour time. This situation badly affects the livelihoods of almost all the coastal poor for obvious reasons. Even the city dwellers in Bangladesh are also affected since the price of *Hilsha* went-up 2 to 4 times high in the market. Only the relatively big mechanised trawlers can harvest relatively large amounts of *Hilsha* in the deep sea far away from the coastal villages, which the artisanal fishers cannot do due to limitation of their fishing crafts and gears.

One participant in one of the PRA sessions in Kuakata Panjupara (Patuakhali) commented that in the not too distant future the *Hilsha* would take its place in the museum. However, it needs to be emphasised that the decline of fishing resources is not linear. For example, in 2001 the situation was somewhat better in that *hilsha* catches went up compared to the previous years, according to the majority of fishermen interviewed.

The old fishers of Chittagong told in the PRA discussions that even during their early days they could fish enough almost throughout the year, with a very brief gap, and they used to get several species of fishes. However, nowadays, their fishing has been reduced to a virtual 'monoculture' of *Hilsha*.

Fishermen recognise that declining fish supplies have led to an increase of selling prices also at their level. As for the net impact of "lower supplies and higher prices" for them, the answers were mixed, in that some fishermen stated that the price increase has somehow compensated for smaller catches, whereas others indicated that the decline in supply was so sharp that a price compensation was not possible.

As for the reasons provided by the fisherfolk for declining fish stocks, these have been outlined above in the section on Natural Capital Assets.

Erosion in the coastal villages, especially along the bank of the rivers, and also along the Chittagong coast of the Bay, is a serious threat to the lives and livelihoods of the poor stakeholders. The fishing hamlets of Lebukhali (Patuakhali), Debraj (Bagerhat) and Kulla (Satkhira) are under the active process of riverbank erosion. These villages are eroding away on a daily basis which is causing serious vulnerability to the livelihoods of the poor. On the other hand sea level rise is also a context of vulnerability for the poor people of Chittagong, Cox's Bazaar & Patuakhali, and the coast of the Bay of Bengal as a whole.

Environmental degradation like land accretion due to siltation under the sea/river is also considered as another trend of vulnerability of the poor coastal communities. In

the coast of Chittagong, Cox's Bazaar and Kuakata and also in the rivers of the remaining villages, the poor are facing the threat of the same problem. It was claimed that due to land accretion under water, the fish habitat moves further away from the existing fishing zone causing a trend of additional vulnerability for the poor stakeholders. This process also affects other sections of the poor due to hindrances to navigation.

The prevalence of **disease** among the poor people and their livestock is also a trend of vulnerability to their lives and livelihoods. Due to poor health and sanitary conditions, outbreaks of diseases like diarrhoea, dysentery, cholera, hepatitis, fever etc. are quite common among the poor people of the six villages. The incidences of diseases are high among the fisherfolk of Latifpur (Chittagong) and Lebukhali due to their overcrowding and contiguous living cum ill sanitation.

Seasonality

The livelihoods of the poor stakeholders of coastal Bangladesh are at a very high exposure to seasonal fluctuations. The fishers as well as the peasants, rickshaw pullers, petty traders etc. of the coastal villages are quite vulnerable to seasonal fluctuations, as the coastal life is characterised by a high degree of seasonality and uncertainty. In Latifpur, and along the Chittagong coast, the major season of fishing is mid-July to mid-November (i.e. only 4 months) and the catch is relatively thin at the beginning and towards the end of this period. Along the Patuakhali coast, the peak season starts during late March and continues up to early September (i.e. a six-month season).

In this season the fishers catch mainly *hilsha* in the Bay and in its estuaries mainly using gill nets and engine or country boats (in Kuakata Panjupara). In every month of this peak season, there is again a peak week (called *Jo* by the fishers) of catch followed by a lean week of catch (called *dala*). That is, peak fishing only takes place during half of the major season.

In Chittagong, fishermen catch mainly *Bombay duck* and a few other species of estuarine fishes during the following 5 months (mid-November to mid-April) with estuarine set-bag net (ESBN) and small engine-boats in the Shandwip Channel (i.e. an offshoot of the Bay of Bengal). The ESBN-season is considered as part of the lean season. There is also a "peak week followed by a lean week" syndrome in this lean season. As a consequence, their catch is further marginalized by 50% even in this lean season. They virtually cannot fish anything in the sea during the remaining 3 months (i.e. mid-April to mid-July) partly due to non-availability of fish at that time as a result of high salinity in the coastal waters (in this period fish move towards the deep sea) and partly for taking *preparation* (net mending or weaving, boat repairing, finance mobilisation) for the ensuing major season (for *hilsha*). Moreover, the catch per unit effort is declining day by day and since the mid 1990s they are getting a scanty amount of fish, and consequently a reduced income, even in the peak season. On the other hand, with a peak season of 8 months the fishers of Patuakhali can fish in the Bay more or less throughout the year with the same syndrome of peak and lean week.

In addition to the fishing season, seasonality also forms part of many other aspects of villagers' livelihoods, including demand for wage labour, access to credit, and occurrence of diseases. The seasonal calendar in Table 10 demonstrates the seasonality in the life of the inhabitants of a coastal village in Bangladesh (e.g. Hatkholapara in Cox's Bazaar District). For example, it demonstrates how wage labourers face financial crises between May to August, which is before the start of the main fishing season. Seasonal calendars in other villages indicate a concentration of disease during February to April (e.g. Latifpur, Lebukhali), or food insecurity between February and April, and in June / July (e.g. Kuakata).

The full seasonal calendars for all the villages are available in the Appendix.

Table 10 : Seasonality in the Fishing Community of Hatkholapara

Months	Baishakh Apr-May	Jaistha May-Jun	Ashar Jun-July	Srabon July-Aug	Bhadra Aug-Sept.	Ashin Sept-Oct.	Kartik Oct.-Nov	Agrahaian Nov-Dec	Poush Dec-Jan	Magh Jan-Feb	Falgun Feb-March	Chaitra March-April
Gill Net Fishing <i>Hilsha</i>	•••	••			•••••• ••••••	•••••• ••••••	•••••• ••••••	••••••	•••••• •	••••••	••••	••••
SBN Fishing chiri, phaisha, popa, bombay duck, kamila, pompret, cat fish, shrimps, other small species	••••••	••••	••••	••••	•••••• ••	•••••• ••••••	•••••• ••	•••••• ••••	•••••• ••••	•••••• ••	•••••• •	••••••
Long Line Fishing Red popa, Mud, Kala, Popa, Keri popa, Sundari, Nakra, Aus	•••••	••••	• •	••••	•••••• ••••	•••••• ••••••	•••••• ••••••	•••••• ••••	•••••• ••••••	••••••	••••••	••••••
Current Net Fishing Jhatka, Phaisha, Pata Bombay duck, Tailla, Alua, Batasha	••••••••	•••••• ••	••••	••••••	•••	••	••	•••••••• ••••	•••••• •••••• ••	•••••• ••••••	•••••• ••••••	•••••• ••••
Phailla Net Fishing Rupchanda, Kalachanda, Big <i>hilsha</i> , Tailla									•••••• •••••• ••	•••••• ••••••	•••••• •	
Mashari Net Fishing (Shrimp fry)	•••••••• ••••	•••••• ••••••	•••••• ••••••	•••••• ••••••	•••••• ••	•••••• ••	••••	••••				
Paddy Cultivation	•••••••• •••	••••••	••••	•••••• ••••••			••••	•••••••• ••••		•••••• ••••••		
Net Making (women)	••••	••••••	••••••	•••••• ••••••	••••••	••••	••••	••••	••••	••••	••••	••••
Wage labour (Fishing)	•••••••• ••••	••••	••••	••••	•••••• ••••••	•••••• ••••••	•••••• ••••••	•••••••• •	•••••• ••••	•••••• ••	•••••• ••••••	•••••••• •••
Wage labour (paddy fields)	•••••••• •••			•••••• ••••••	••••	••••	••	••••••	••••	•••••• ••••••	•••	
Income (boat owner and crew)	••••••	••••	••••	••••	•••••• ••••••	•••••• ••••••	•••••• ••••••	•••••••• ••••	•••••• •••	••••••	••••••	••••••
Marriage	•••••••• ••••	•••••• ••••••				••••		••••	••••			•••••••• ••••
Need for cash & credit	••••••••		•••••• ••	•••••• ••••••	•••••• ••		•••••• ••					
Financial crisis (wage labourers)	••••	•••••• ••••••	•••••• ••••••	•••••• ••••••						••••••		

Livelihoods Outcomes: Wealth and Poverty in Fishing Communities

Results of Wealth Rankings

Wealth ranking exercises have been carried out in all of the six fishing communities as part of the PRAs. Depending on the villages, three to five wealth categories have been identified.

Ownership of assets such as land, fishing boats and nets, house (and its condition), financial resources, and animals have been identified by the villagers as key criteria for wealth. In addition, access to education and health services, as well as social influence, and types of job or business were mentioned.

Table 11: Summary of Wealth Ranking Exercises

	Latifpur	Hatkholapara	Kuakata Panjupara	Lebukhali	Debraj	Kulla
Wealth categories according to villagers, and number of households (HH) per category	Big (<i>bara</i>) / Rich: 12 Middle (<i>Majhari</i>): 40 Small (<i>choto</i>) / poor: 49 Total HH: 101	Rich: 3 Moderately rich: 17 Middle class: 19 Moderate poor: 62 Poor: 9 Total HH: 110	Rich (<i>Dhani</i>): 8 Middle class (<i>Majari</i>): 50 Moderate poor (<i>Motamuti Sachaal</i>): 92 Poor: 44 Total HH: 194	Rich (<i>Sachaal</i>): 23 Middle class (<i>Samannya garib</i>): 7 Middle poor (<i>Modhya garib</i>): 11 Poor: 11 Very Poor: 22 Total HH: 74	Rich (<i>Mohajan</i>): 6 Middle class (<i>Madhyam gerostha</i>): 13 Well off (<i>Sachaal</i>): 41 Poor: 49 Very poor: 61 Total HH: 170	Rich (<i>Sachaal</i>): 13 Middle class (<i>Majari</i>): 17 Poor 55 Total HH: 85
Proportion of Moderate Poor to Very Poor	49%	65%	70%	59%	65%	65%

A rich household would own several acres of land (e.g. up to about 20 acres in the case of Koakata, 12 acres in Hatkholapara, 3 acres in Lebukhali, 6 acres in Debraj, 3 acres in Kulla)⁷. The exception is Latifpur on the Chittagong Coast where even richer households

⁷ One *bigha* equals 10 *kata* or 33 decimals, 100 decimals equals one acre.

would not own more than 0.1 acres). On the other hand richer households in Latifpur would own at least two fishing boats and more than 10 nets.

Equally, in Hatkholapara the well-off villagers own at least three boats, a brick-built house in Cox's Bazaar, a colour television set, have good education for their children and can afford medical treatment in Bangladesh or abroad. For comparison, the well-off in a riverine village like Debraj would own at least four heads of cattle for cultivation, would own a large shrimp pond (i.e. 25 bigha), and would be able to send their children to college or University. In places like Kulla and Lebukhali, the rich households also own a boat or may own a shrimp *gher*, and be able to educate their children up to secondary school.

It is noticeable that the richest households have a diversity of income sources such as agriculture, fishing, and other businesses like trading or money-lending.

The **middle-income households** also tend to have a diversified livelihood, however on a smaller scale. They would also own some agricultural land⁸, albeit smaller in size, own a boat and a few nets, would have a small amount of capital, and would be able to send their children to primary school or up to class eight. In addition, they may be able to afford medical treatment in the district capital.

The poor and very poor own very little or no land except for their homestead. Their agricultural production does not last very long to feed the family. Also, in many cases the very (i.e. hardcore) poor live on Government *khas* land, which is often threatened by erosion. Their main sources of income are fishing using inexpensive gear (e.g. shrimp fry collection), or labour on boats or in the field. They may also engage in businesses, which are frowned upon by the other villagers (e.g. fish hawking by poor women) or in more extreme cases they have to resort to begging. They are often not well dressed, live in small houses or huts, and are generally struggling to meet household expenses (e.g. food, medical treatment, etc). In particular, the hardcore poor face periods when they have little to eat. Although in theory their children have access to Government primary schools, in reality many youngsters have to work in the fishing sector or as labourers to contribute to the family income.

According to the villagers' own judgement, the **proportion of the poor (i.e. Moderate Poor to Very Poor) within the fishing communities**, is of the order of 50 – 70% in the communities visited. It has been observed that the number of households belonging to the hardcore poor is relatively less in the villages of Hatkholapara and Kuakata Panjupara. This may be related to the fact that tourist spots are developing in their vicinity (i.e. Cox's Bazaar and Kuakata Beach, respectively), thereby creating alternative income sources in these locations. In addition, the availability of shrimp seeds and other less valued species in the Bay of Bengal provide the poor with comparatively better livelihood opportunities than in other places. At the same time, it ought to be mentioned that there is often little difference in the living standards between the so-called middle classes in the villages and the poor.

⁸ Once again, Latifpur represents an exception in that the middle-income group does not own land.

Tables 12 and 13 indicate the detailed results of the wealth ranking exercises carried out with the inhabitants of the two villages of Lebukhali and Kuakata.

Table 12: Results of Wealth Ranking Exercise in Lebukhali

Rich (Sachaal)	Middle class(Samannya garib)	Middle poor (Modhya garib)
# They have land up to 266 Decimals # Have capital # They have net and boat # Can go to Barishal and can pay up to Taka 200 as fee # Can invest money with Interest # Work as <i>dadandar, aratdar & Paikar</i> # they can live the Whole year from their own production and can store for the future # Children can go to school up to SSC # Can wear good cloths No of Households: 23	# They have land up to 40 Kora # Some of them work as day labour # Have small capital # They have net and boat and catch fish six months # Most of them work on others boat # they can live only nine months from their own Production # Children can go to school up to class eight # Can go to Dumki for treatment No of Households: 7	# They have land up to 30 Kata # Some of them work as day labourer # Don't have capital # Some of them have net and boat # Most of them work on others boat # they can live only six months from their own Production # Can go to school up to class five # Can go to Lebukhali health complex No of Households: 11

Poor	Very Poor
# Own very little land for cultivation and have own House # They have land up to 20 Kora # Few of them have net and Boat # Most of them work on Others boat # they can live only three months from their own Production # Can go to school up to class five # Can go to Lebukhali Health complex No of Households: 11	# No land, they stay at khash land # Work as labour in others boat and land # Children can go to primary school without tuition fees # Can go to Lebukhali health centre (Govt.) but cannot purchase medicine # Sometimes have to starve # Face problems for cloth purchase No of Households: 22

Table 13: Results of Wealth Ranking Exercise in Kuakata Panjupara

Rich (Dhani)	Middle class(Majari)
<p># They own at least 1862 decimal land # At least 500-600 mond Paddy produced # Secured Livelihood # Savings at bank at least taka Tk7-8 lakh # Electricity and TV at home</p> <p># House at Alipur Bazar # Social influence # Children can go to college and university # Can go to Dhaka, Chittagong And even overseas for treatment # Can help mosque madrasa etc # Have <i>arat</i> and invest Money as <i>dadan</i> # Wear expensive dresses # Have expensive furniture</p> <p>No of Households:8</p>	<p># They own at least 532 decimal land # At least 200 mond paddy produced # Secured Livelihood # Savings at bank at least taka 50-60 thousand # Most of them have color TV at Home # Own House at Kuakata Bazar # Social influence # Children can go to Kolapara College # Can go to Dhaka for treatment</p> <p># Can give small amount to mosque / madrasa etc # Some of them are service holder # Some of them have grocery Shop</p> <p>No of Households: 50</p>
Moderate poor (Motamuti Sachaal)	Poor
<p># At least 5 Kora- 4 Bigha land # Can live 2-3 months by own rice # Most of them have Dingi boat and 2 nets</p> <p># Children can go to school up to class five # Can go to Mohipur to Upazila health complex for treatment</p> <p># Food is secured the whole year by their earnings # Some of them have Pan Shop # Dress is not very good # 90% are fishermen</p> <p>No of Household: 92</p>	<p># Live on (Gvt) kash land and don't have own land # Work as labourers on fields and Boats # 10% people of this category have net and dingi by <i>dadan</i> # Some times they have to fast (i.e. nothing to eat) # Some women catch Pona</p> <p># Can not go to doctor for treatment # Children can go to Maktob # Men wear lungi costing Tk80</p> <p># Women wear Shari costing Tk 100 # Don't own more than 2 saris and one shirt and 2 lungi for women.</p> <p>No of Household: 44</p>

Levels of Household Income

As could be expected from the wealth ranking exercises, there is a wide variation in income levels within the communities. The poorer segments of the village population often rely on employment as wage labourers in fishing boats or agricultural production.

It was found that the wage rates are quite location specific. For example, in Kulla, which is a more remote village in Satkhira District, daily wage rates tend to be of the order of Tk40/day (without food) for female agricultural labourers, and Tk50/day (without food) for male labourers. However, it ought to be mentioned that villagers reported that work is not available to same extent every day.

In places like Lebukhali and Kuakata, which are better connected to the main road system, the wage rates are higher. For example, in Lebukhali, agricultural wage labourers are paid Tk100/day plus 3 meals a day during the peak season, and Tk60/day plus three meals a day during the lean season.

The wage labour market of Kuakata is considered to be more competitive by the villagers, due to the availability of alternative income occupations as a result of NGO interventions. In addition, the village is becoming a tourist attraction and has a thriving fish processing site. In August 2002, the wage rate in Kuakata were about Tk60-70 per day with food, or Tk50 per day plus three meals plus pan (betel-leaf) and bidi (a local variety of cigarette). Compared to this it was reported that a shrimp fry collector on the nearby beach could earn about Tk50 – 100 per day.

The poor are often also paid in kind. For example, an elderly lady in Kulla village would get 20kg of paddy per month for doing household work such as husking and winnowing paddy, and working as a maid;

On the other hand, owners of fishing boats can earn substantial net incomes during a fishing season. This can range from about Tk50,000 to over Tk100,000 for the owner of a smaller sized engine boat. Fishermen owning small country boats have much lower income. For example, it was reported that two fishermen (using one boat) could earn approximately Tk4,000 – 5000 per month after deduction of all costs by fishing on the river.

Owners of dried fish processing enterprises reported a net income of Tk100,000 to Tk200,000 per six-month drying season. The labourers in the fish drying industry earn an estimated Tk15,000 – Tk20,000 per season (i.e. about Tk3,000 per month).

Traditionally, the income of labourers on fishing boats is determined through a sharing agreement. In general, after sale of the catch the boat owner gets about 50% and the rest is shared among the crew members in accordance to their skills.

In addition to finfish species, shrimp fry catching represents an important economic activity in coastal communities, in that over fifty percent of all households in the villages surveyed by the Meghna Estuary Study (MES, 1998) are engaged in this occupation and earn an estimated 25 – 30% of their annual income (i.e. about Tk7,000, figures refer to second half of the 1990s).

The Livelihoods of the Poor, from a Women's Perspective

According to poor women who participated in Participatory Poverty Assessment exercises, the **visible signs of poverty** include the following:

- The houses of the poor are very small and in a poor condition (i.e. walls and roof), which is likely to result in bad health. Many of the poor fisherfolk live in simple semi-permanent bamboo and grass houses occupying no land beyond that on which the house is built (Rogers and Blowfield, 1993);
- Due to the expenses involved, the poor only own very few clothes and what they wear is often old or torn;
- They can only manage one meal a day, based on a limited diet (e.g. *dal*, fish and rice water);
- They lack financial resources, including savings and only limited access to informal credit. In addition, there are claims that the NGOs credits are less available for the “hardcore” poor;
- Do to their low social status, they get harassed by influential people. This is also a negative factor when they are involved in litigations;
- Although they may be forced to make a living from different income generating activities, they do not have access to the more lucrative sources of income such as trade or other self employed businesses;
- The poor only own very few properties. They do not own land;
- The poor lack education or cannot manage to send their children to school;
- To earn a livelihood, poor women normally make mats, rear cattle for livestock owners, sew or weave nets, husk paddy, work as maids, or beg.

According to the women, the following are the **causes of poverty**:

- As a result of the *dadan* chain, they cannot free themselves and they are constantly indebted. The *dadandars* try to keep the fishermen indebted. If a fisherman has a good catch, they will just take part of the catch without payment;
- Because they have outstanding loans, they cannot save any money;
- Robbers steal their nets and catches and sometimes even kill crew members;
- In the case of Hindus, they have no access to services, as they belong to a low caste. Even if they are educated, they don't have access as they are not being taken seriously
- Natural disasters such as cyclones and floods, causing destruction of livelihoods assets;
- Accidents or deaths of husbands or sons when they are fishing;
- Serious illness, and old age, preventing people from work;

- Many children. In the case of many boys the land will be split. In the case of girls, the family has to pay substantial amounts of money for dowry;
- The poor lack skills and education to enter any other occupations;
- The men do not allow the women to go outside and work because of social insecurity (violence and rape by Muslim men indicated in Hindu villages). The men only want their wives to invest in their own business (fishing);
- Declining fish catches resulting in low income (reasons for declining fish stocks are provided in the section natural assets);
- In the case of the Chittagong coast, gas and oil companies who come and tell the fisherfolk to clear the shore, as a result of which the villagers cannot go fishing;

Box 1: Case study of a poor woman-led household in Kulla

Namita Roy, whose husband left her 10 years ago, had to look after five daughters and one son. She was in a very difficult situation then. She started working in other people's homes, husking paddy, preparing fuel from cowdung, and weeding in the fields. In return, she used rice husks and rice particles to maintain her family. Sometimes the landladies provided her with a few vegetables. Most of the times she had to hunt for the spare fish catches when the boats landed at the landing centre. With that she could maintain her family.

Her working day began at 7am to 1pm and from 3pm to 5pm. She couldn't manage to educate her first three daughters. Only when the situation turned a bit better she started educating her fourth (up to class v) and fifth daughter(class vi) and the son (v). She managed to arrange the marriage of her first three daughters. She gave her fourth daughter to her sister to raise. And the fifth one is now with her to work as daily labour. Her son is 15 years old.

She managed to buy a *behindi* net and a small boat by taking out loans from several sources (i.e. from Grameen Bank Tk8,000, her relatives Tk 4,200) and selling four goats and one cow). Now the condition of her health has turned worse. She suffers from stomach and waist pain. She can serve one half of a day. For the first half of the day she can get Tk25 , and for the second half-Tk15. Her son gets paid Tk30-40 daily.

She can remember now the times when she had to survive having arum leaves as food. At the beginning, when she was in a very difficult situation, the well-off villagers hesitated to talk to her since she was so helpless. Now she has reached at least a ground to "drag" her family. She never lost heart no matter what happened and who neglected her. She used to rush if there was an opportunity to work. Nowadays, every once in a while she feels tired to take on so many tasks. She can't work any more as she used to in earlier days

Suggestions on ways to move out of poverty:

- Creation of new job opportunities. However, women do not necessarily want to leave their own business. In some cases they want alternative job opportunities for a few of their family members
- Access to money to invest in small businesses such as dairy farming, aquaculture, poultry, small industry through employment creation.
- Government support to have free education services for up to Secondary School level. Also skill training is required. However, it was also mentioned that skills alone are not sufficient if there is no capital to start a business;
- Some individuals manage to find their way out of poverty. For example, one woman in Latifpur managed to improve her income and moved out of poverty. She works very hard, i.e. she sells fish in the market until 10pm in the evening. She also sends her children as agricultural labourers to other people's farms (e.g. for weeding). Overall, she managed to build up some savings.

Constraints to move out of poverty, which were mentioned by women⁹:

- Inferiority complex of the community (indicated in Hindu communities);
- Women are always engaged in domestic chores;
- Lack of skills;
- Lack of financial assets;
- Lack of unity in the community;
- Lack of social security for them as a minority group.

As far as the mobility of women is concerned, it ought to be mentioned that due to the prevalence of male chauvinism and religious cum social conservatism, in particular the Muslim women are not allowed to work outside their homestead premises. Moreover, mostly in the villages, the Muslim women are not allowed to appear before adult male persons other than their husbands, sons, brothers, etc. They have to wear veils (borka) covering them from head to feet. As a consequence, obviously, the women face severe difficulties to move around in search of work / IGAs.

To some extent, nowadays, there appears to be a sort of exception for the hardcore poor women, who are forced to move around for their bare living, given that there are very few alternatives left for them to live on.

Who are the most vulnerable?

- Old people without children. Due to the absence of social security services, they become very vulnerable once they are too old to work;
- Widows/divorced women, who have to stay again at their father's residence after marriage. Social taboos restrict their movements and access to income sources.
- People who have either no children, or too many, in particular daughters (i.e. due to dowry requirements);
- Those who are ill, and, as a result of their condition, cannot work;

⁹ To some extent, this is a repetition of the causes of poverty. In that respect it should be viewed as a summary of the main points.

- Families without an earning household member;
- Those who have to work at old age;
- Those who do not own a house to live in.

Livelihood Constraints Expressed by Villagers

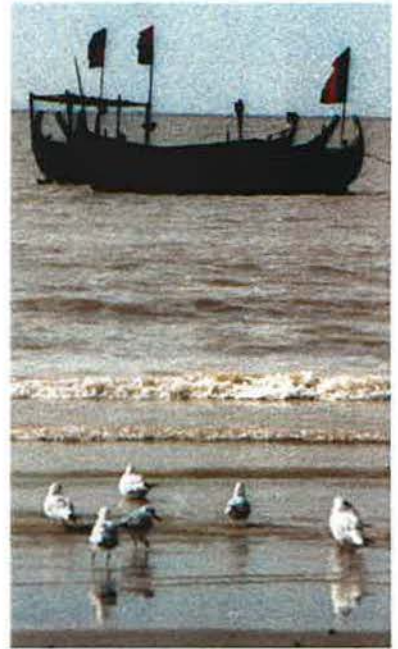
Table 14 provides a summary the main livelihoods constraints encountered by the villagers in the six study locations. The constraints have been collated per village from different exercises with different groups of stakeholders and individuals. As a result, they are not necessarily in a prioritised order. Nevertheless, the issues of lack of financial resources (i.e. easy access to credit on favourable terms), declining fish supplies and piracy were the three most commonly stated problems. Other, more marketing related, points include, the obligation to sell through *dadandars*, poor infrastructure at landing centres and in markets, lack of transport, inadequate supply of ice, lack of market information, and lack of alternative income generation activities.

Unsurprisingly, marketing appears to be more of a problem in villages located in remote areas lacking good road access (e.g. Kulla, Debraj). This reflects on issues such as availability of price information and marketing facilities. Lebukhali, which is also a riverine village, however situated about two kms from the main Patuakhali – Barisal road, does not appear to face the same problems. Here, the fishermen can sell directly at the road side market. The villages with easy access to urban centres by road or boat (e.g. Latifpur, Hatkholapara, and Kuakata Panjupara) face the least problems with marketing in that growing urban demand ensures there is a constant demand for fish.

As far as access to credit is concerned, it appears that if fishermen are “exploited” due to loan arrangements with traders, this reflects inefficiencies of the credit system rather than in the marketing system. A more detailed analysis of credit and the role of *dadan* is provided in the section below on credit access for fisherfolk and traders.

Table 14: Livelihoods Constraints Expressed by Fishing Communities

Latifpur	Hatkholapara	Kuakata Panjupara	Lebukhali	Debraj	Kulla
<ul style="list-style-type: none"> • Decline in fish supply • Piracy on the sea • Trawlers damage / destroy nets • Boats are in poor condition • Have to sell fish to <i>dadandars</i> • People cannot go to the market due to lack of own stalls • Women can only sell in near vicinity or near road side • Lack of capital, and lack of access to easy credit • Lack of connection between main road and landing centre • Lack of ice plants or cold storage facilities close to landing site 	<ul style="list-style-type: none"> • Lack of capital • Absence of training opportunities • Poor children cannot go to school or attend training • Expenditure habits of fishers during main fishing season (little money is saved) • High interest rate of informal loans (10-20%) • Lack of toilets or pit latrines • Too little land available for housing, hence overcrowding • Lack of jobs for women • High dowry expenses: Tk25,000 – 50,000 to be paid to the man’s family 	<ul style="list-style-type: none"> • Lack of capital • Sea-bank erosion • Piracy in the sea • No lighthouse for signalling system • No nearby hospital or health centre • Government services are not available without bribe <p>Local traders’ comments:</p> <ul style="list-style-type: none"> • Lack of capital • Inadequate infrastructure • Scarcity and high price of ice, this impacts on quality of fish • <i>Hilsha</i> catch has reduced to a extend • Increased cost of storage (for ice) during hartal, transport strike, political turmoil 	<ul style="list-style-type: none"> • Capital paucity • River bank erosion due to river Paira • Local health services are not good • Cyclones and floods • Lack of electricity • No local market for fishing gear • Local fish market is small • Insufficient number of tube-wells in the hamlet • Schools are ok but transport can be a problem during monsoon season • Poor housing; this is a major problem during the monsoon season 	<ul style="list-style-type: none"> • Piracy • Forest guards’ tyranny • Bad road communication • Electricity load shedding leads to high cost of ice • Declining fish catches • Difficulties for families with single earners • Lack of youth employment • Expenses are high and income is low 	<ul style="list-style-type: none"> • Lack of capital • Low fish catches • Lack of market information • Fishermen don’t get the actual price • Lack of roads and transport • Low price for minority fishermen • Lack of ice • Distance to bank • Local fish market inadequate • “Santrash” (Terror) • Snatching/ piracy in the river • ESNB nets damaged by waves or tree branches • Accidents during net setting • Cyclones and floods • New entrants (mustans) are trying to encroach upon villagers’ fishing grounds



Fish catching, handling and marketing

MARKETING OF MARINE FISH

This chapter mainly presents the findings of the Participatory Rural Appraisals and Rapid Market Assessments of the marine fish distribution system. This includes an assessment of the relationship between marketing and credit. Given that fresh fish and dried fish follow separate distribution channels, it has been felt appropriate to analyse the two marketing systems separately.

Market Operators – Their Roles and Constraints (fresh fish)

Fishermen

This section only highlights some of the key characteristics of fishermen as part of the marketing chain. More details on fishing communities can be found in the previous section presenting the results of the Participatory Rural Appraisals on the livelihoods in coastal communities.

Several categories of fishermen and fish catching enterprises have been encountered during the course of the survey, namely:

- Fishermen who work in other people's boats,
- Owners of small motorised and non-motorised boats,
- Owners of wooden trawlers (i.e. Danish boats),
- Industrial trawler companies.

Fishermen who work in other people's boats tend to have an arrangement with the boat owner regarding the share of the catch. Usually, it is the owner of the boat (i.e. *Bahaddar*) who obtains the biggest portion of the catch (i.e. about 50 - 60%), whilst the crew obtains the remainder. Nevertheless, there are also cases where crew members belong to the wider family of the boat owner and are paid a salary (Tk50 – 100 per day) plus meals for their work (e.g. Latifpur / Silempur). In this case, the boat owner (*bahaddar*), who may not necessarily join the fishing crew in the sea, will sell the entire catch himself and keep the sales proceedings.

Part of the income of commercial trawler workers tends to be based on a fixed salary, and part of it is based on a bonus depending on the amount of fish caught. The bonus is calculated using an agreed formula.

Fishermen in smaller boats tend to sell their catch at sea to collector boats or they sell it at the landing centres. Traditionally, they rely on informal sources of credit for their fishing operations. This can involve the purchase of boats and other gear such as nets, plus working capital for fuel, food for the crew etc.

The *dadandar* (i.e. fish trader cum money-lender) is the traditional source of credit for fishermen as regards their fishing operations. The amount of *dadan* involved in these operations tends to reflect the resources of fishing communities and gear used. On the

other hand the credit conditions can vary from location to location. Traditionally, a *dadan* taker (i.e. borrower) would be obliged to surrender his fish to the *dadandar* (i.e. money-lender cum *paiker*) at a price which is considerably below the market price (i.e. 20 – 40%). The outstanding principal would often be used to tie the borrower to the *dadandar* over a longer period of time, which may result in further indebtedness. However, these credit arrangements tend to vary, and new forms are beginning to emerge. For example, there are so-called “new” *dadandars* in the Latifpur – Kumira area (Chittagong District), which charge 20% of market transactions. They are not fish traders, but money-lenders who may have acquired their capital in other types of business (e.g. poultry production). Also, fishermen who own larger boats may be able to deal directly with *aratdars*, thereby by-passing *paikers*. This benefits both boat-owners and *aratdars* as one level of intermediary can be cut out. More details on the interlink between marketing and credit are contained in the section on credit access for fishermen and small fish traders.

Constraints typically expressed by small-scale fishermen:

- Piracy, i.e. theft of boats, nets, and engines;
- Depletion of fish stocks and catches (only 2001 monsoon was better in some places);
- Lack of capital, which forces people to take out *dadan*; as a result of the latter they only get a reduced price for their catch after deduction of a price differential by the *dadandar*;
- In some remote areas, lack of market information, and transport;
- In the Chittagong area, army practices (which prevents them from fishing), and ship breaking yards, which can cause destruction of nets.

Paikers

Paikers are a form of intermediary trader who can have several functions. On the one hand, they can play the role of assemblers at the landing centres (primary markets), on the other hand, they can be wholesalers who trade the commodity between secondary and higher secondary markets (i.e. wholesale markets) of the country.

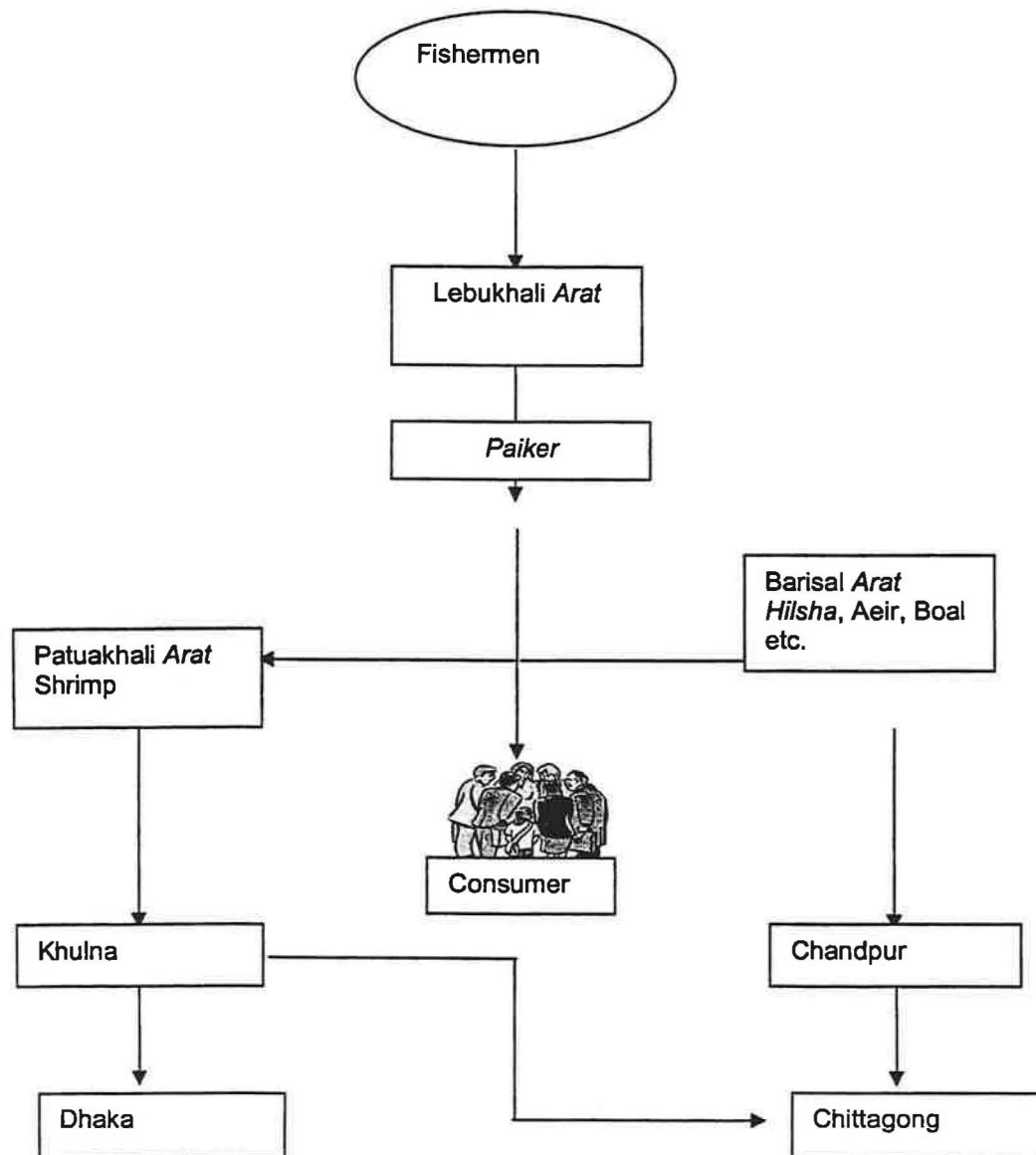
In general, *paikers* are tied to a limited number of *aratdars* who provide them with loans for their working capital. The total amount of working capital per *paiker* is in the range of Tk10,000 – Tk100,000 depending on the business acumen of the individual. If they have *dadan* from an *aratdar* then they have to sell/buy their fish through/from him, using him as a commission agent who usually gets 3-6% commission for his services and costs involved. Part of the commission (i.e. up to 3%) may represent an informal form of interest charged by the *aratdar*.

No attempts have been made here to provide a detailed account of regional variations of middlemen categories such as *dalal* (local broker at landing site), *faria* (mobile assembler) or *beparies* (i.e. distributors at secondary wholesale markets). For more details, the following literature is recommended: Dastidar (2001), Hussain et al (1995), and Coulter and Disney (1987).

Typical constraints expressed by *paikers* include the following:

- Lack of capital, and lack of access to “easy” credit,
- Decline in fish supply,
- Piracy. This affects them if the fishermen who they provided with *dadan* lose their boat and gear, and it also affects them if they are boat owners themselves,
- Lack of security at landing centres, and insufficient legal protection,
- Lack of infrastructure (e.g. lack of connection between landing centre and road),
- In more remote locations, lack of ice plants and cold storage close to the landing site.

Figure 4: Commodity Chain of Fresh Fish, Lebukhali (Patukhali District)



Source: Mapping of Commodity Chain by Fish Traders in Lebukhali, August 2001

Aratdars

Given their central position in the wholesale markets, *aratdars* play a leading role in the fish marketing system of Bangladesh. They can play several brokerage functions at the same time. This includes commission agent whereby they obtain a percentage fee of the auctioning price (i.e. normally 3 – 6 %, in the case of fresh fish marketing), or wholesaler whereby they become the buyer and seller of the commodity. In some instances, part of the commission fee is also seen as an interest on *dadān* which they advanced to intermediary traders (i.e. *paikers*).

Table 15: Number of Fresh Fish *Aratdars* in Selected Cities

City	Number of <i>Aratdars</i>
Chittagong (out of which Fisheries Ghat)	120 (72)
Dhaka (out of which Kawran Bazar)	700 (about 170)
Patuakhali (out of which Mach Ghat)	30 (16)

Although the total number of *aratdars* may be used as an indicator of competition in the fisheries wholesale markets, it ought to be remembered that there are important differences as far as their endowment with working capital is concerned. One *lakh* Taka (i.e. Tk100,000) is the very minimum amount of working capital required to become a small *aratdar*. Big *aratdars* who are based in major wholesale markets are estimated to have a working capital of up to Tk10 *crore* (Tk 100 million), reflecting their substantial market power. For example, there are only about 6 out of 72 *aratdars* that dominate the Fisheries Ghat in Chittagong.

According to *aratdars*, major changes in the fish marketing system, include the following:

- Improved road transport;
- Better availability of ice;
- Better communication through the use of mobile phones;
- Lending skills of *aratdars* have improved (i.e. they now study the feasibility of a project if someone requests a loan).

In comparison, the following main problems were stated by *aratdars* in different locations:

- Pirates, who also attack bigger boats. According to them, this is getting worse due to “professional dacoits”; they are expecting the Coast Guard to establish security;
- Declining fish supplies, resulting in “lost business”, especially between 1998 and 2000, (2001 was somewhat better);
- Lack of financial support through project loans at preferential interest rates;

- Lack of institutional support, such as better market infrastructure or advice;
- Road access to markets is often too narrow, markets lack shelter, etc.
- In some places, lack of ice factory and public cold storage.

High levels of competition, and collusion can co-exist at the same time in fisheries wholesale markets. Competition is likely to be highest when there is a shortage of supply. On the other hand, price fixing may take place when there is a glut of fish arriving in a market. Also, trader societies tend to be closely knit. Entry into business may be easy for newcomers in theory, but fraught with obstacles in reality. For example, “good relationships” are usually required to gain access to an *arat* that becomes empty. In other cases, *aratdars* have admitted that they would try to boycott the business of a newcomer by “poaching” his *paikers*.

At the same time, due to their endowment with assets (i.e. financial and otherwise), innovations in the marketing chain are most likely to be initiated by *aratdars*. This can be an initiative for up-grading a wholesale market (e.g. new cement flooring to improve sanitary conditions as could be observed in Chittagong Fisheries Ghat), or the exploration of new export markets.

Box 2: Case Study of Female *Aratdar* in Dhaka

As for the role of women at the wholesale level in the marketing chain, only one female *aratdar* was encountered during the course of the survey. Here personal circumstances (i.e. death of her husband who was a bus driver) forced her in the 1980s to seek employment. Gradually, she managed to enter the fish *aratdar* business using her husband’s insurance pay-out as starting capital. She is based in Dhaka Kawran market, has about 60 – 70 suppliers, but wouldn’t be able to tell the number of her buyers. She only deals in freshwater fish.

Retailers

Two main categories of fish retailers have been encountered during the course of the study, namely, market based retailers, and itinerant fish vendors. The number of fish retailers can be substantial in the major urban areas. For example, 5000 – 7000 fish retailers are estimated to be plying their trade in Dhaka at the beginning of the 21st century (Source: *Aratdars* in Dhaka). Compared to this, CODEC (1994) estimated the number of fish vendors in Chittagong at about 2000.

The variation in size of working capital amongst retailers who are based in urban fish markets can be considerable (i.e. Tk2,000 – 30,000). The daily turnover of a stationary retailer can be of the order of Tk1,000 – 15,000, yielding a net income of Tk200 – 3,000 per day. Their costs include expenses such as rent of market place, fees, ice, electricity, transport, labour, etc. Their complaints include:

- Lack of infrastructure, i.e. drainage, roofing, handling facilities;
- Poor accessibility of market, i.e. higher income consumers cannot access the market by car due to road congestion;

- Lack of working capital; e.g. they can obtain fish on credit if it is purchased from a local *aratdar*, but they have to pay cash if they want to procure fish from another market.

Itinerant retailers (i.e. vendors, hawkers) are likely to earn a daily income of the order of 50 – 200 Taka, which is based on a turnover of up to Tk1,000. Their costs include mostly transport, ice, and packaging.

According to CODEC (1994), constraints expressed by fish vendors, include the following:

- Lack of capital,
- Spoilage of fish / reduction of value,
- Lack of van,
- Hijacking/civic disorder/disturbance by police and hooligans,
- Exploitation by middlemen, incl. *aratdars*,
- Lack of permanent sales spot.

Table 16: Case Studies of Costs and Margins of Fresh Fish Retailing in Urban Centres

	Vendor in Dhaka, Female	Vendor in Chittagong, male	Vendor in Chittagong, male
Purchase price	Tk 800 mixed lot of fish	Tk875 17.5kg of tilapia @ Tk50/kg	Tk535 11.5kg of bails @ Tk46.5/kg
Marketing Costs	Rent: Tk30 Bags: Tk10 Ice: Tk10 Total: Tk50	Rickshaw: Tk60 Salt: Tk5 Ice: Tk10 Packaging: Tk1 Total: Tk76	Carrying: Tk40 Rent of stall: Tk30 Ice: Tk20 Total: 90
Sales	Tk950	Tk1085 17.5kg @ Tk62	Tk690 11.5kg @ Tk60
Income	Tk100	Tk134	Tk65
Marketing margin	19%	24%	29%

Source: CODEC / NRI, Trader Surveys

In particular, at retailer level, there is the “conflict” of marketing efficiency and equity. Due to their limited amounts of fish traded, which is the result of their small capital base, especially the small retailers and vendors require a higher proportion of their marketing margin as income. On the other hand, the small-scale retailer’s relatively high share of the marketing margin will ultimately have to be borne by consumers who often also belong to lower income groups. At the same time it needs to be borne in mind that a large number of livelihoods depend on fish retailing.

Although women do not play a very prominent role in the marine fish distribution system, they are most likely to be encountered at the retailer level. Despite their relatively small numbers compared to their male colleagues (i.e. not more than 10% - 20% of the total number of retailers), fish retailing provides an important employment for women who are often in vulnerable situations. In particular, poor women can be found near fish markets where they trade in small quantities of fish or where they beg for small amounts of low-quality fish from other traders.

Also, women traders can be found in coastal Hindu communities (e.g. close to Chittagong) where they act as local vendors selling fish from door to door. In addition, they are involved in grading and sorting of fish.

Box 3: Case Study of Women Fish Vendors at Latifpur Landing Site

Often women become fish vendors due to poverty. They don't like the profession very much, because, according to traditional customs, *'you would not allow your woman to go out, walk around and sell fish'*.

A typical fish vendor would buy a 12kg basket of bombay duck for Tk500-600 and 250 pieces of mud crabs for Tk250. If the catches are high, they go further away to sell their fish (e.g. Pahartali market, which is in a suburb of Chittagong). In that case, they need to use ice and pay for transport costs.

They usually sell about 2-3 times a day, depending on the catches of the day and the number of times, the fisherman go out fishing. The women claim to make about Tk50-200 net profit per basket, but sometimes they lose. Profit margins are higher if they mix the bombay duck with shrimps (e.g. Tk100-150). They usually buy the fish directly from the fishers at the landing site, not from the *paikers*, and take it directly for sale to the village and/or local markets, either on cash or credit. The fishermen they buy from are often their sons or other relatives. Selling within the village from a basket is most profitable but carries the risk that it is sold on credit and they have to wait for their cash. Most of them have their regular customers in the village, who usually buy on credit and repay once a month the whole sum.

There are many vendors and the competition is quite tough, especially now the supply of fish has gone down which makes the competition even tighter. As a result, their incomes are decreasing. Although the market price for fish is quite high, the profit is less due to high operation costs.

They can get a loan from a usurer against 20% interest a month. Most of the vendors have usurer loans of the order of Tk2,000-10,000 for working capital. For example, Ms Bimala borrowed Tk1,500 against 20%, and lend it to a fisherman to ensure a good supply of fish. She then pays about Tk30 less for a lot, compared to buying from a fisherman, who does not have a *dadan* with her. Most vendors have taken out loans to provide loans for fishermen, however those with husbands or sons fishing, do not have to do that. The women face strong competition from the *paikers* as they buy most of the fish

and only little is left for the *beparies* (i.e. vendors) to buy. The women prefer to buy from the landing site because they know the fishermen (some are their relatives) and they don't have to buy on cash. They usually buy on credit and pay the fishermen after they have sold their lot. If they would go further away to other sites to buy fish, they would have to compete with other buyers and pay cash straightaway.

Constraints encountered by the vendors:

- The muslim *paikers* force them not to bid high. If they do, they get harassed. *Paikers* also take away the big and good quality fish.
- Sorting of fish sometimes takes quite some time and it takes longer for them to get to the market to start selling.
- They admit that they sometimes use colour/pigment to keep the fish good looking
- High interest on usurer loans and *dadans*. They need access to cheap capital.
- Insecurity due to robbing, snatching and theft.

Bangladesh Fisheries Development Corporation (BFDC)

Amongst other things, the BFDC, which was established in 1964, includes the following functions: to establish units for preservation, processing, distribution, and marketing of fish and fish products (Hussain, 1995). This involved the building of landing centres and infrastructure related to fish processing and distribution in cities such as Barisal, Chittagong, Cox's Bazar, and Khulna. However, the acceptance of BFDC was mixed. For example, whereas the landing facilities in Khulna and Cox's Bazaar are used by fisherfolk and traders, the landing centre in Chittagong - Firinghee Bazaar Bridge Ghat was not well accepted by the traders. Reasons given included:

- The location was not convenient, i.e. there were problems with access for lorries,
- Traders were concerned about disruptions to their business (due to small terminal and insufficient number of *paikers*),
- Fish trading in Chittagong traditionally takes place at Fisheries Ghat,
- Traders had to pay extra fees / taxes out of their commission (i.e. 20% or 1 Taka of every 5 Takas commission).

Although there was some fish traded at the Chittagong BFDC terminal in 2001 this appeared to be less than 20% of the quantities traded at the Fisheries Ghat. Most of the trading and office space was not used. The traders encountered at the BFDC facilities appeared to be *aratdars* and *paikers* who lack financial strength compared to those operating in Fisheries Ghat. Some of the BFDC traders apparently were not successful in setting up a new business in Fisheries Ghat.

In view of this, it seems important to identify a more sustainable institutional setting for those BFDC facilities which are under-utilised. Relevant solutions should be worked out in collaboration with trader associations.

Ancillary Services

Although reliable statistics do not exist, it can be assumed that the marine fisheries distribution system provides direct and indirect employment for over one hundred thousand people.

In addition to the trader categories described above, this includes workers belonging to industries such as:

- Transport, including countless porters, rickshaw and lorry drivers, boat operators;
- Ice manufacturing and distribution, and cold storage;
- Packaging, including basket makers, etc;
- Money lending;
- Cleaning of markets.

Costs and margins

The main cost elements of traders have been indicated in the above sections. Table 17, which is the result of numerous trader interviews, provides an overview of *hilsha* traded between Chittagong and Dhaka in July 2001.

It indicates a fishermen's share in the consumer price which is 50%. The total marketing margin, which is also 50%, is sub-divided into:

Assembling:	17%
Wholesale marketing:	22%
Retail marketing:	21%

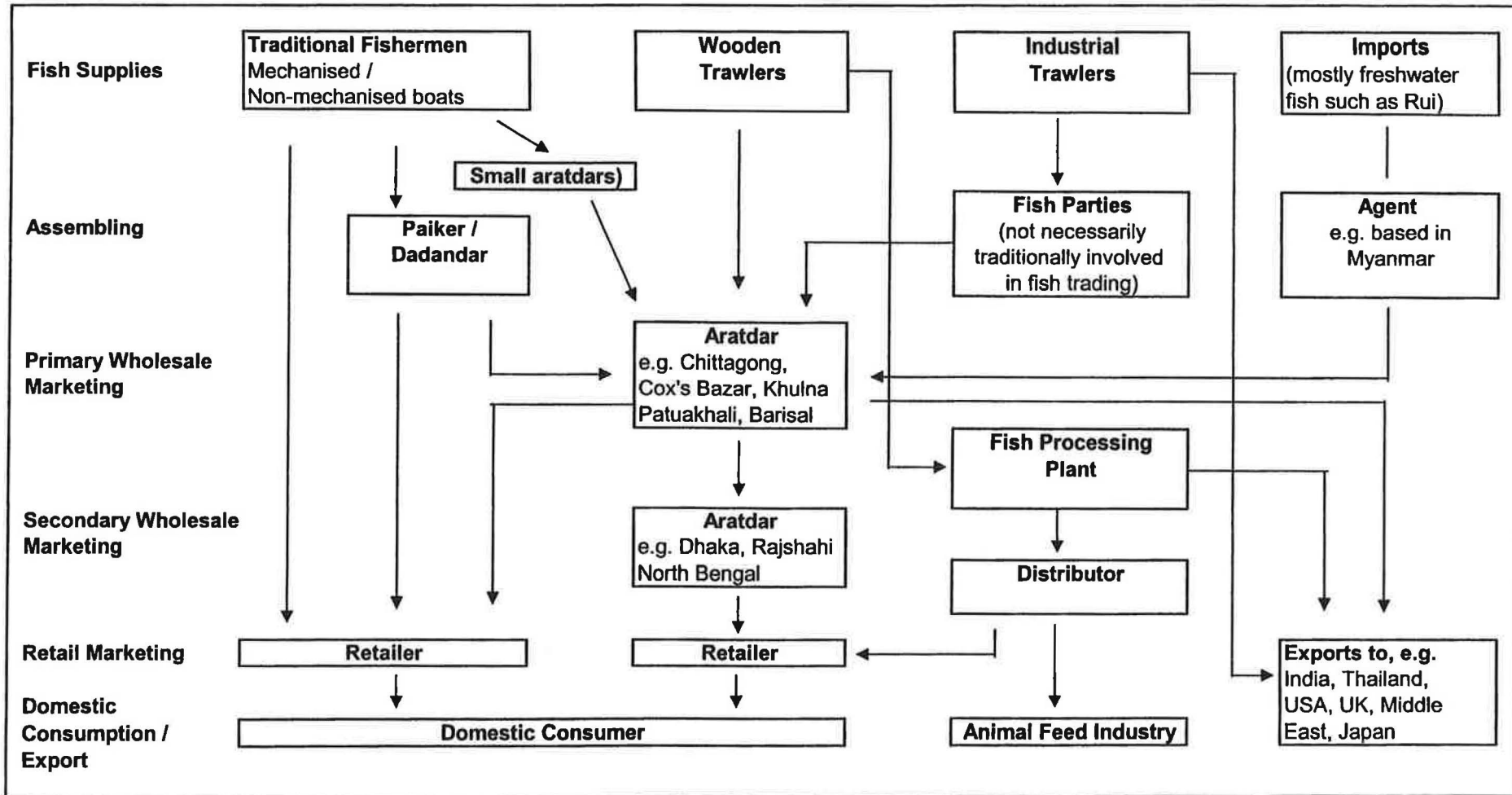
It ought to be mentioned that in this case the marketing margin is relatively high to the "long-distance" marketing between Chittagong and Dhaka involving several transport stages and trader categories. Fish consumed closer to the site of catching is likely to result in a higher fishermen's share. Compared to the above figures, Amed (1983, cited in Hussain 1995) has identified a fishermen's share of 60 – 63% and a middlemen's share of 37 – 40% for marine fish sold in Chittagong and Cox's Bazar.

Table 17: Marketing of *Hilsha* from a Landing Centre near Chittagong to Dhaka Markets, July 2001

Selling Prices and Marketing Costs	Tk/kg	%
Assembling		
Selling Price: Fisherman to <i>paiker</i> at landing centre	60.00	50%
Transport to assembly / wholesale market (by small boat or rickshaw)	1.50	
Ice	1.00	
Labour	2.50	
Packaging	0.25	
Commission (5% of sales; to <i>aratdar</i>)	4.00	
Net income for Chtg <i>paiker</i>	10.75	
Wholesale Marketing		
Selling Price: Chittagong <i>paiker</i> to Dhaka <i>aratdar</i>	80.00	67%
Transport from Chtg to Dhaka, by truck	1.50	
Ice	1.50	
Packaging and handling	1.30	
Miscellaneous	0.50	
Opportunity cost of capital (5% of wk capital)	4.24	
Net income for Dhaka <i>aratdar</i>	5.96	
Retailing		
Selling Price: Dhaka wholesaler to retailer	95.00	79%
Retail marketing costs	13.00	
Net income to Dhaka retailer	12.00	
Selling Price: Dhaka retailer to consumer	120.00	100%

Assumptions: - No *dadar* involved between fisherman and *paiker*; part of commission paid by *paiker* to *aratdar* represents interest on loan
 - Transport is by truck;
 - Prices are for small – to medium sized fish (300 – 600 grammes).

Figure 3: Commodity Chain of Fresh Marine Fish





Fish processing

Dried Fish Marketing

Market operators – Their roles and constraints (dried fish)

As illustrated in Figure 4, the main supply areas of dried fish are Cox's Bazar District, and the coastal parts of Bagerhat, Noakhali, Khulna, Patuakhali, and Shatkhira Districts. In particular, fish drying takes place in remote parts which lack transport and supply of ice. Nevertheless, there are also locations which have an established reputation for supply of good quality dried fish and which continue processing despite improved road communication with other parts of the country (e.g. Kuakata). Usually, the fishermen sell the fresh fish to so-called processing parties, which then sell the dried fish to traders in Chittagong. The 24 *aratdars*, who are based in Asadgunj of Chittagong represent the financial backbone of the dried fish processing industry in Bangladesh. Imports appear to be on the increase due to declining local supply and increasing demand as a result of population growth.

Given that the dried fish marketing chain represents an entirely different system from the fresh marketing chain, it was deemed appropriate to deal with it *separately*. The following sections describe the activities of some of the key actors involved in dried fish processing.

Processors

October to March are the main months when fish processing takes place in Bangladesh. The main species which are used for drying are *chhuri* (Ribbon fish), *loyitta* (Bombay duck), *fashia* (anchovies), and *chingri* (shrimp). Other species, which are also dried and traded, but in smaller quantities include, *poma*, *pomfret*, *chapla pata* (sting ray), *hunger* (shark), *datina bol*, and *sunabein*.

Two categories of workforce can be distinguished within the processing industry; i.e. the owners of drying enterprises, who usually have a *dadan* from *Aratdars* in Chittagong, and the labourers. The latter also include female workers.

The seasonal income of an owner of a drying enterprise is of the order of Tk100,000 to 200,000. According to the processors (e.g. Kuakata), labourers get 50% of the profit after deduction of all costs. A labourer's seasonal income is of the order of Tk15,000 to 20,000. Women workers mostly belong to the hardcore poor and tend to be paid on a daily basis (i.e. Tk50 – 100/day).

Problems stated by processors include the following:

- Overall, fish supply is declining, and certain species are becoming quite rare;
- Lack of security, e.g. piracy of dried fish transported by boat, or fear of being robbed at night at the drying site close to the beach.
- Lack of capital.

Box 4: Case Study of Dried Fish Processors based in Kuakata

Background: Fish processing in this part of the country started about 40 years ago. Initially, there was a lot of fish in terms of quantity and species. Nowadays there are much fewer species available. Originally it was *araidars* from Chittagong who came here and started fish processing in Kuakata. Drying racks were introduced around 1985; tourists apparently played a role in that they suggested to the processors that they could sell more if the quality was improved (e.g. no sand in the dried fish);

The fish drying site at Kuakata Beach is made up of 15 'owners' who possess so-called houses. In total there are about 100 people working at the drying site. All the workers are local, i.e. from the village or vicinity. Most of the 'owners' are also from here, although a few seem to be coming from other parts of the country (e.g. Cox's Bazaar). 30% of the workers get involved in fishing during the monsoon season when no drying takes place. In addition, a few owners (i.e. 5-7) also get involved with fishing during that part of the year. The main drying season lasts 5 – 6 months; i.e. early October to March.

A few of the workers are women, i.e. about 10-15. They mostly belong to the hardcore poor; e.g. widows or beggars. Their role consists mainly of sorting the fish, and hanging fish (i.e. chiefly bombay duck) on the drying racks.

Species which are dried more in this area are shark (hunger), and sting ray (chapla pata). Both are rarely consumed fresh. The latter are also exported and used for shoe-making. Other species dried in Koakota include: bombay duck, suna bein (i.e. Golden), datina bol.

Species which are less available nowadays for drying, include: churi (ribbon fish), pomfret, poma, fashia, etc.

According to the processors, there was a **50% reduction of fish** over the last seven to eight years. Reasons for declining supplies, include: Industrial trawling, bagda fry collection, catching of juvenile fish with ESNB.

Also, **piracy** is common and affects fisheries. Killings have occurred. Due to piracy in the sea they now prefer transport the dried fish to Chittagong by truck. According to the fish processors, dried fish worth 15 *lakh* Taka was recently snatched from a boat near Kumira. They say piracy may happen three times a year.

Steps involved in fish processing:

Purchase of fish through auction on the beach or 'Owners' go with their small boats to trawlers to buy fish. All 15 'houses' have a cartel arrangement to keep the price within their limits; sometimes they also go individually in order to bargain; sometimes they all go together to a trawler (i.e. wooden motorised fishing boat), buy the fish and auction it amongst themselves; the highest bidder gets it and the margin is shared amongst themselves.

The next step consists of chopping the shark next to the sea; all the fish is washed if it is not clean already. Then it is brought to the drying places (racks, mats); shark fins and Bombay duck are salted;

For the first two days the fresh fish is kept outside; the following 4 – 5 days the half-dry fish is kept in-house during the night; the next 2 – 3 days complete drying takes place. As a result, the entire time between purchasing the fish and end of drying is about 8 days.

Most of the time fresh fish is used (ie. good quality); sometimes there is degraded fish used if a trawler stays out for 15 days. Lower quality fish is sold at a lower price;

Processing Costs: Processors buy per lot; on average, 2 – 4 mounds of fresh fish are processed per day per “house”. The processing costs amount to Tk500 per mound (40kg) including costs of drying racks, labour and means of preservation. The processors strictly deny that chemicals are used. Only salt is used against insect infestations. According to them, chemicals are used by processors in other chars when the monsoon season starts.

Income: According to the owners of the “houses”, they can earn Tk100,000 to Tk200,000 per processor per season. There is a sharing arrangement between owners and labourers; after all costs are deducted 50% of the net profit goes to the owners and the rest is shared amongst the workers. The latter can earn Tk15,000 – 20,000 per season; i.e. approximately Tk3,000 per person per month.

Credit: Almost all the drying houses in Koakota have *dadan* with Asad Gunj; i.e. on average Tk40,000 – 50,000. They have direct communications with *aratdars* (i.e. mostly by phone). Fish processors have to pay 2% commission to *aratdars* in Chittagong Asad Gunj. Money is transferred by bank; the processors cannot influence the price, they rely entirely on the *aratdars*; they didn't know the current price (i.e. the one of ‘today’) but have a good idea of what was paid a few days previously.

Characteristics of processors (owners of drying houses):

Most of them seem to be fairly young, i.e. between 25 – 30 years of age; they appear quite dynamic and switched on regarding business matters. Their working capital mostly corresponds to *dadan* they have received from Chittagong based *aratdars*. On average, they have about four years schooling; nobody has more than seven years school education. About 20% of them have no schooling at all. One processor who works with his brothers said the latter depend on him because they have no school education and he has been for four years to school which enables him to calculate.

When asked about minimum schooling required to run a business like theirs, they said primary education is the minimum requirement but seven years would be better;

Their requirements:

- Capital, i.e. more working capital so that they can increase their business;
- Better protection; they are far away from the village, as a result they are afraid of pirates (e.g. after dusk they don't buy fish for fear of piracy); They are forming an

organisation and want to get registered; they also asked if CODEC or other NGOs could provide them with arms for their protection;

- Technical assistance for fish processing is not required, according to them.

Traders

Chittagong Asadgunj wholesale market is the hub of the dried fish industry in Bangladesh. It consists of 24 *Aratdars* and about 200 wholesalers. It is estimated that 10,000 to 20,000 tonnes of dried fish move through Asadgunj wholesale market per annum. The *aratdars* are primarily commission agents (2% commission per transaction), whereas the second category buys the dried fish, stores it and sells it to the markets highlighted in Figure 4. There appears to be a traditional obligation whereby the wholesalers have to buy through *aratdars* (*dadan* providers).

Regarding capital endowment and market share, 5 – 6 *aratdars* and 10 – 15 wholesalers dominate Asadgunj dried fish market.

Constraints expressed by dried fish *aratdars* and wholesalers include the following:

- Declining fish production. According to them, there are no problems with marketing but with supply;
- *Hilsha* is not dried in sufficient quantities, due to demand for fresh fish;
- Returns on *dadan* are becoming lower as a result of declining turn-over;
- Lack of quality of dried fish. For example, exporters state that there is a lack of good quality dried fish. Also, some locations have a better reputation for good quality dried (e.g. Rangabali and Kuakata), whereas others seem to be lacking quality.

Costs and margins involved in processing and marketing of dried fish

Table 18 shows the costs and margin involved for processing Bombay Duck in Kuakata and selling it in Chittagong Asadgunj wholesale market. The processor's net income and marketing/processing margin appear to be reasonable. However, it ought to be mentioned that these calculations are based on average price figures. It was reported that the price for fresh Bombay Duck in Kuakata may be as low as Tk5 per kg during a glut (e.g. in October / November).

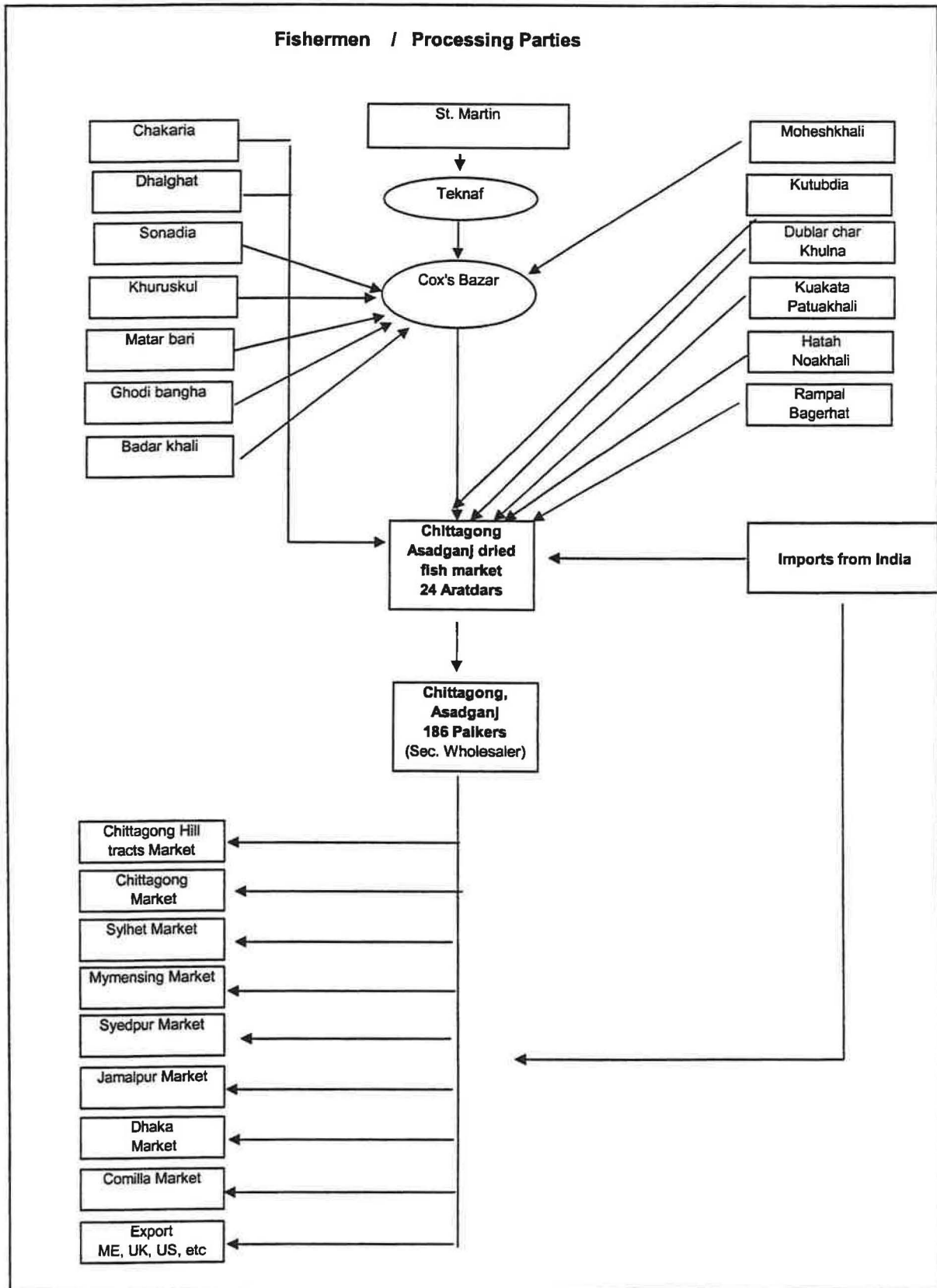
Table 18: Processing and Marketing of Dried Bombay Duck from Kuakata to Chittagong

Prices, Processing and Marketing Costs	Tk/kg	%
Selling price of fresh fish: fisherman to processor (on average, Tk5,000 per 400kg of fresh fish)	12.50	
<u>Selling price of fresh fish, equivalent to dry fish</u> (4 kg of fresh fish are required to obtain 1 kg of dried fish)	50.00	64%
<u>Processing costs (Tk500 / 40kg of fresh fish)</u> (according to processors this includes labour, fixed costs of drying racks, etc)	12.50	
<u>Marketing Costs</u>		
Transport to Chittagong per truck		
Truck fare	1.10	
Arrangement fee with transport company	0.10	
Labour (carrying)	0.25	
Loss (2.5%, mainly weight loss)	1.95	
<i>Aratdar</i> commission in Chittagong (2% of selling price)	1.56	
Total costs (purchase of raw material, processing losses, and marketing)	67.46	86%
<u>Selling price in Chittagong: Processor to Wholesaler</u> (on average, Tk75 – 80/kg of dried Bombay duck; processor is unlikely to travel to Chtg given the trust between him and the trader)	78.00	100%
Net income for Processor	10.54	14%

NB: - Percentage figures are in relation to buying price by wholesalers in Chittagong Asadgunj Market;
- The survey was conducted in January 2002.

Dried Fish Marketing

Figure 4: Commodity Chain of Dried Marine Fish



Processing, Handling and Distribution of Marine Fish

Marine fish are consumed fresh, dried or salted. High value species such as prawn and pomfret are also exported as are dried jewfish, shark fin and mud crab. There is a small frozen fish trade and a live fish trade (prawn fry). Small miscellaneous fish caught as trawler by-catch, if not discarded at sea, are landed in frozen form and either enter the fresh fish market or are dried to produce fish meal.

Fresh fish are usually sold whole, but some filleting and gutting takes place at the retail level. Unless the fish are specifically landed for drying or are landed from short fishing trips near retail markets, ice is normally used at some or all stages of distribution to aid preservation.

Use of Ice

Ice has been used in the fishery sector for over thirty years in Bangladesh. Block ice plants are established in Cox's Bazaar, Chittagong, Dhaka, Khulna, Barissal, Bagerhat, Patuakhali, Mohipur/Alipu, Dhaka and Noakhali and supply ice for use on-shore as well as at sea.

Ice is used on board trawlers and mechanised boats which fish for more than a day. Sixty to eighty cans (4.8 to 6.4 tonnes) of ice can be used on twelve-day trips to ice 100 to 150 maunds of hilsa (6 tonnes).

High value fish are iced and stored in insulated boxes at markets in landing centres. Some high value fish are also frozen and stored in domestic chest freezers.

Ice is applied during repacking at markets and during transportation by road and boat. Retailers in some markets ice fish before and during sale. Ice is sometimes used if fish have to be stored overnight for sale the following day.

Improvements in road communications have meant that ice is now more easily transported to remote rural areas.

Demand for ice increases during times of seasonal peak landings such as the hilsa season from May to September. Higher temperatures also mean more ice is required. Electricity supply problems at this time of year can lead to shortages in ice supply. Anecdotal evidence suggests that some traders may not be able to get sufficient ice during these periods and this affects fish quality. During periods when the quantity of fish landed is small ice plants either do not operate or operate on a part time basis.

Over the last ten years the number of plants in areas such as Patuakhali District has increased dramatically. In Alipur and Mohipur for example there are now 24 ice plants each capable of producing between 150 to 400 cans of ice within 48 hours. There were only 2 or 3 plants 10 years ago, with most new plants having been established in the last 3 years. At the time of the visit however only 4 plants were working due to low demand

for ice. A new electric power line installed in 1993 helped the establishment of these new plants.

Nevertheless, a representative of an ice plant association stated that “throughout Bangladesh ice plants are now a losing concern”. And that in some areas plants are closing due to a lack of fish and are being sold for scrap. Even so there were reports during the visit that investors were looking to build new plants in areas where there already appeared to be over-capacity.

Infrastructure and Markets

Facilities at landing sites and main wholesale markets vary in design and level of sophistication. Aside from shrimp processing plants, the most developed infrastructures are the Bangladesh Fisheries Development Corporation Market complexes which consist of a market area on the ground floor and trader offices on the first floor. Not all of these facilities are used to the fullest extent.

Key features of some private sector fresh fish wholesale markets are the rudimentary nature of facilities, limited or no roofing (are not all weather), limited space, with repacking and icing often done on streets and pavements surrounding the main market area, lack of water supplies and toilet facilities. The ground surface of enclosures is either bare or part rendered. Drainage is often particularly poor and during hours of business, water from various sources accumulates to create dirty pools. Design is such that mobility within the market is difficult at peak times and the risk of bacterial contamination of fish is high. In particular, this applies if fish are removed from baskets or sacks and placed on the ground for auction. These markets are often privately owned, or leased, by a number of individuals. Ownership and responsibility can change due to political processes or according to mutual agreements.

Retail markets vary in terms of size and level of infrastructure. Some retailers sell from very basic sites often by the side of roads. Whilst other markets, particularly in urban areas, are more established with roofs, drainage, rendered slabs and lighting. Some retail markets are often within more general food markets where fruit and vegetable and other meat can be purchased.

Dried fish wholesale markets consist of a series of go-down/stores within which sacks or piles of dried fish are held for periods of time. To the front of the stores are sitting areas where traders meet prospective purchasers and samples of fish are on display. Fish are sorted/graded and repacked either inside or nearby the market. There may be an animal feed mill nearby.

Some long established wholesale markets are in areas, which are difficult for modern road transport to reach (e.g. trucks) and are easily congested. In some rural areas visited road transport is still seen as a problem, particularly if roads are narrow and poorly maintained making access difficult for trucks. Large numbers of ferry crossings delay fish distribution.

Packaging and Storage

At sea fish are usually not packed into containers. After landing a variety of containers are used to transfer fish from one point to another during distribution. Woven baskets with or without polythene liners, polypropylene sacks and aluminium bowls are typical containers used. Fish are also transported in bulk on the back of lorries. Some fish are packed in plastic bags. Dried fish are normally distributed in sacks. Salted hilsa are packed and distributed in cans.

Transport

After landing fish are transported long distances by boat, bus, lorry or pickup truck. For short distances between landing and market or between wholesale and retail market headloading, pushcarts and rickshaws are normally used.

There have been improvements associated with boat and road transport in some areas, which have made it easier and quicker to move fish around the country. Mechanised boats are now widely used and there has been an increase in the number of private transport companies. In some areas roads have been surfaced, repaired and widened. On some routes the numbers of ferries have been reduced due to bridge building and there has been an increase in the number of small vehicles such as pickups, which are ideal for carrying smaller consignments of fish.

Despite these improvements there are still roads which slow down the transport of fish such as stretches of the Chittagong to Dhaka road. Roads to wholesale markets in major urban areas are often very narrow and block with traffic easily constraining the movement of fish, buyers and ice in and out of markets.

Food Safety and Fresh Fish

During the March 2001 project workshop the use of formalin (solution of formaldehyde in water) on fresh fish was raised. It was alleged that this chemical is being used to extend the shelf life of fresh fish imported into Bangladesh. Research by the project did not produce any evidence that formalin is being used.

Some retailers of low value pelagics such as scads and mackerel were observed to sprinkle a mixture of salt and soda on to fish during repacking to make the fish firm. This practice is also said to be used on hilsa. The soda is said to be washing powder. Retailers say that if they did not use salt/soda then the fish would be soft and fetch a lower price. Soda was also said to be used on hilsa from Myanmar to make it whiter. Retailers of pangas apply red dye to the fish's lips and fins to enhance its appearance. The dye is said to be that used to colour rice or cows blood is used. Most fish seen during the visit on sale at major ferry landing areas had been treated with some sort of colouring agent. Solutions of red food colouring are sometimes applied to fresh fish to enhance appearance before the fish are retailed. Chemical analysis was beyond the scope of the research. More information is required on these practices before conclusions can be drawn.

Post Harvest Fish Losses – Fresh Fish Trade

Improvements in road communications and the use of ice, coupled with smaller catches and consignments of fish has meant that post-harvest fish losses related to quality deterioration of fresh fish has greatly reduced over the last ten years at all stages of distribution. A loss in quality does still occur but the incidence and magnitude of this loss has significantly decreased.

Where fishing times are short (several hours) and retail markets are within a short distance of the landing centre consumers are able to purchase good quality fish, even if ice has not been used. Alternatively, after capture fish may spend several days iced on board the fishing vessel before being landed and then transported by lorry or boat for 10 hours or more to major wholesale markets for onward selling. The time temperature factor, inadequate use or lack of ice on board mechanised boats, poor quality ice, unloading, packing and sorting in unhygienic conditions are factors which facilitate spoilage and quality degradation.

Some fish are sold according to quality grades as well as according to size. During summer high hilsa landings can coincide with a shortage of ice and lead to quality degradation. Low quality fish are sometimes landed by trawlers and mechanised craft which stay at sea for more than 7 days. Poor quality low value small pelagics such as kauwa are often sold in urban areas.

Specific handling and distribution practices which lead to a loss in quality of fresh fish include:

- a) Inadequate icing on board vessels and over long fishing trips
- b) Fish is loaded, unloaded and repacked several times during distribution. This facilitates damage and increases the risk of microbial contamination, leading to a reduction in shelf life.
- c) Over packing on board vessel and during transport causing physical damage.
- d) Unhygienic conditions on board trawlers and in markets increases the risk of microbial contamination and hence an increased rate of spoilage.
- e) Although ice is now widely used on shore best practice is often not applied. The ice:fish ratio is often not ideal. Ratios of 1:3 to 1:5 were observed for long distance transport. More ice should be used to achieve adequate chilling and maintenance of low temperatures. A better ratio would be 1.5:1.
- f) Ice is often made from river water and therefore may carry a high microbial load increasing the risk of contamination.

Consideration needs to be given to the cost implications of addressing these issues and stakeholders willingness to change practices. Furthermore, by improving the quality of fish may increase the cost of this fish to the consumer and this may have negative implications for the poorer consumers who rely more on fish of low quality and low price.

Dried Fish

A proportion of marine landings are sundried for either domestic human consumption or animal feed. Jewfish are salted and dried in various locations for export from Cox's Bazaar to Hong Kong and Singapore.

Fish for domestic consumption are sundried in Cox's Bazaar and on various islands (Dubla, Moheshkali, Sonadia) and remote coastal areas such as Kuakata between September and April – the non monsoon period.

Fish are sun dried on racks and frames or mats laid on the ground. Dried fish are stored in the drying yards for days or weeks before being transported in sacks by road or boat to Asadgonj dried fish market in Chittagong. Here the fish are sorted and stored in go-downs owned by the numerous *arata*dars and *paik*ers who have a major influence over the trade. From the go-downs the dried fish are transported by lorry to wholesale markets throughout the country.

Hygiene at dried fish processing sites are poor with human faeces and fish carcasses strewn nearby. Apart from the public health issue, such conditions will promote and maintain a background population of blowflies, which infest fish during drying, especially in the warmer months when rain makes drying difficult. Areas of shrub vegetation nearby drying areas provide ideal shade for blowfly during periods of sun and heat.

The quantity of fish that enters the traditional drying sector has reduced because of reduced landings of fresh fish particularly in the Cox's Bazaar area, and because more fish is now being iced and sold fresh. Some species, which are traditionally dried, are also much rarer such as pabda (*Ompok pabo*), batasi, shole, gulsha, sharputi, kalighonia, big popa, and lakkhya.

Ten years ago it was rare to find dried fish from India on the market. However, a significant proportion of dried fish sold in Bangladesh now arrives from India (*churi*, *nalia*, *dhan*cha, *loitty*a, *kachki*). Some of this fish bypasses the traditional centre for dried fish marketing, Asadgonj market in Chittagong and instead is supplied direct to various districts.

According to traders in Kawran Bazaar, Dhaka, four years ago approximately 40% of dried fish was destined for the poultry feed sector. Now due to the availability of cheap

imported feed from Australia and New Zealand much less dried fish is used. Also, there has been a growth in the demand for dried fish for feed for fish culture (pangas).

In Kuakata, 10 years ago there were 7-8 dried fish processors now (i.e. 2002) there are 24. Although the volume of fish processed at the site has increased over time, this is divided between more processors who now each handle less fish than they would have if they had been operating 10 years ago. There has also been a change in the way fish is bought from fishermen by some processors. *Dadan* is now seen as risky as fishermen are less able to catch enough fish to cover the advance. So some processors now prefer to buy fish with cash.

Dried fish is now also transported by truck to Chittagong rather than by boat due to the increased incidence of theft at sea.

Use of Insecticides

Evidence of the use of insecticides by dried fish processors and traders to combat insect infestation of drying and dried fish came to the attention of the Bangladesh authorities and media in the mid 1980s. In the early 1990s specific research (Walker & Greeley 1991, Ward 1992, Cox 1992, Gain, undated) showed that insecticides are used in two ways:

Fish are dipped in solutions before drying to prevent blowfly infestation during the drying process;

Dried fish are treated with insecticide powders to prevent infestation by beetle larvae and adults (*Dermestes spp*) during storage.

Insecticide Use During Drying. Rain, dull weather and humid conditions hamper sun drying and fish remain moist and prone to attack by blow fly larvae. To prevent infestation during the drying process fish are dipped in insecticide solutions. According to Walker and Greeley (1991) the insecticide most commonly observed and reported as being used on fish was dichlorvos, marketed by Ciba-Geigy (Bangladesh) Ltd as "Nogos 100 ec". This is an organophosphate compound, which is meant for the control of insect pests on rice and vegetable crops.

In spite of a heightened awareness amongst processors of the potential dangers of insecticides processors still use insecticides such as Nogos, especially during the two difficult drying months (Feb/March). Jewfish are also dipped in a solution containing an unknown chemical to protect fish from insect attack during drying.

Insecticide Use on Dried Fish. The majority of dried marine fish produced in Bangladesh passes through Asadgonj market in Chittagong where in the 1980s and early 90s traders were known to apply insecticide powders to dried fish to prevent infestation by beetles. Customers were said to pay 10 – 15 % less for beetle damaged fish. There is also a weight loss incurred (Walker & Greeley 1991). Powders that were commonly used by traders included DDT, Basudin 10g (diazinon) and Gramoxin. Other insecticides used on

dried fish go by the names Crush, Finis and Malathion dust. Analysis of samples of insecticides used showed that Benzene Hexachloride (BHC) and Carbyl as well as sub-standard formulations of DDT are also used (Cox 1992). Insecticide use was also known to occur at other markets and storage areas.

The research in 2001 and 2002 has shown that Basudin, DDT and Gamoxin are still used by some traders in Cox's Bazaar, Chittagong and Dhaka. These are either spread on the fish or around the gunny bag containing fish. During the rainy season it takes about 20 days for a sack of fish to become infested at Asadgonj Market and approximately 250 g (40 Tk worth) of any insecticide powder is used to treat one sack of fish.

Food Safety Implications. None of the insecticides said to be in use are approved by the World Health Organization for use on fish or fish products. Most are for pest control on agricultural crops. The only two approved insecticides for use on dried fish are pirimiphosmethyl and pyrethrum synergized with piperonyl butoxide.

There is no information on the potential harmful effects these chemicals may have on dried fish consumers or on the users of these chemicals. Insecticides enter the human body as a result of ingestion, inhalation and absorption through the skin. Some are known carcinogens. Dichlorvos can cause chest problems, vomiting, and paralysis. High levels of DDT in pregnant women has been linked to premature births and low-birthweight infants. Both contribute to infant mortality (ENV 2001). DDT ingestion can cause damage to the nervous system and seizures (ATSDR 1995).

Consumers of dried fish are eating products which may contain the residue of one or more potentially harmful substances. Dried fish is consumed by a range of stakeholders in Bangladesh, but it is often seen as an important source of animal protein for the poor, particularly in north Bengal and other rural areas. A key asset of the poor is their health which in turn determines their ability to undertake income generating activities such as labouring. Health problems will jeopardise what may be their main and only source of income as well as having cost implications. Labourers who use these chemicals expose themselves to risks from inhalation and absorption of the chemicals through their skin.

CREDIT ACCESS FOR FISHERFOLK AND TRADERS

This section describes the findings related to credit and micro-finance in the coastal communities and the fish marketing chain. The emphasis of the section is on the fishing and trading context, although it is acknowledged that fisherfolk require financial resources and loans also for other purposes. More details of financial assets held by fisherfolk are contained in the livelihoods analysis above.

Survey Findings

Aratdars are at the centre of the financial system of the fish marketing chain, in that they finance both backward and forward linkages. Establishing firm supplier and buyer relationships is one of their main motivations for providing often substantial amounts of loan. By accepting a loan, the *dadan* taker is obliged to sell through or buy from the *aratdar*, who benefits in the form of a commission (i.e. about 5% in the case of fresh fish, and 2% in the case of dried fish). At the same time, the *aratdars* take a certain amount of risk in that credit takers can make financial losses, or “disappear” altogether.

The *dadandar* (i.e. trader cum moneylender) represents a form of intermediary in the credit chain in that they tend to be the ones who are dealing directly with the fisherfolk. They obtain informal credit (i.e. *dadan*) from the *aratdar* which they invest in fishing communities in order to ensure supply. Generally, they will advance the credit to the fishers before the main fishing season, which the latter will use as working capital in getting ready for their business (e.g. boat repair, hiring of crew, purchase of nets, fuel, and other supplies). As a consequence, the fisherman can only sell his catch through the *dadandar*, who usually reduces the market price by 20 – 40%. This price differential corresponds to a sort of high, informal interest.

Table 8 summarises the positive and negative sides of the *dadan* system as encountered in 2001/2002. Nevertheless, there are substantial variations in the informal credit system, and changes are occurring such as:

- The strong presence of NGOs appears to have led to lower interest rates in certain parts of the country (e.g. Patuakhali District), by creating competition with traditional money lenders. The result is lower commission charges and interest rates, i.e. 5 – 10% per month, as compared to 10 – 20% in areas with little or no NGO intervention. Competition between NGOs is also likely to have played a role in this context.
- Emergence of so-called “new” *dadandars*, who are in fact only moneylenders (e.g. Latifpur – Kumira, Chittagong District). They are not involved in trading activities as such but monitor sales transactions by fishermen who obtained a loan from them. The “new” *dadandars* are likely to have accumulated their capital in other businesses. They claim a fixed percentage of the sales transactions (e.g. 20%). Women are also active as “new” *dadandars*. When asked about their preferences, the fishermen stated that they preferred the “new” *dadandars* since with this arrangement they could obtain the actual market prices and knew what interest rate they had to pay.

- Fishermen appear to benefit if they are able to deal directly with *aratdars* rather than through *paikers* cum money lenders (i.e. *dadandars*). In this case they only have to pay a certain commission to the *aratdar* like anybody else. However, this implies a minimum scale of catches. Small-scale fishermen who have to go to the sea on a daily basis are unlikely to be able to get involved in sometimes time-consuming sales transactions (i.e. if located further away from the landing site). On the other hand it was possible to observe boat owners, who do not join their crew during fish catching, selling the catch belonging to them directly to the *aratdars* (e.g. Latifpur village). This indicates that certain stages of the marketing chain can be by-passed by fishermen if they are in the right location (i.e. close to a market centre) and have the right connections with wholesale traders. Related pilot project initiatives, which would be expected to lead to a smaller marketing margin, should be encouraged to be carried out by NGOs and other development bodies.

Table 19 provides examples of *dadan* in relation to location and gear used. Box 3 shows the case of a fisherman in Chittagong District who used *dadan* to start his business.

Table 19: *Dadan* Arrangements in Fresh Fish Marketing Chain According to Location

Location and Type of Fishing	Type of Gear Used	Amount of Loan	Repayment Arrangement
Lebukhali, Patuakhali District Riverine Fishing	Dingi boats, 2 – 4 crew	Tk 1,000 – 5,000 for two to four people	10% Commission per sale, which has to go through <i>aratdars</i>
Kuakata – Panjupara, Patuakhali District Coastal Fishing	Non-motorised boat, 12 nets, 6 crew	Tk 10,000 – 20,000, for crew of six	5% Commission to small <i>aratdars</i> based at Kuakata Ghat
Latifpur, Silempur, Kumira Chittagong District Coastal Fishing	Mechanised boats, 5 – 6 crew, 12 – 20hp	Tk30,000 – 70,000	Fish has to be sold to <i>dadandar</i> (i.e. <i>paiker</i> cum money lender) who pays a price which is 20 – 40% below market rate; In addition, there are “new” <i>dadandars</i> who charge fixed rate of 20% per sales transaction.
Hatkholapara Cox’s Bazar District Coastal Fishing	Mechanised boats, up to 20 crew, 40 – 70hp, Gillnet, MSB net, or Longline	Tk10,000 – 30,000 for smaller boats, and up to Tk100,000 for wooden trawlers (i.e. “Danish Boats”)	Fishermen have to sell to <i>dadandar</i> (i.e. <i>paiker</i> cum moneylender), who pays 10 – 20% below market price.

Box 5: Case study of Fisherman in Selimpur who received *Dadan*

Background information: Mr D. is 42 years old, has 4 children, i.e. 3 sons and 1 daughter. He has been fishing for 20 years. Before that he did not need to earn money and could depend on his father's salary. He has a 13 yard boat with engine and 12 gillnets but no MSBN nets. He is only into *hilsha* fishing. During the lean season he is involved in fish trading. Eight years ago he separated from his brother and decided to buy his own equipment.

His original investment was:

Tk30,000 for boat

Tk14,000 for seven nets

Tk10,500 for engine

Tk6,000 for working capital (i.e. for crew, fuel, etc)

His capital consisted of:

Tk15,000 equity

Tk25,000 *dadan*

Tk10,000 from moneylender @ 5% per month

Tk10,500 additional loan from *dadandar*

At the end of the season he paid back Tk10,000 to the *dadandar*. In the second year, he took new loan of Tk15,000 and repaid Tk10,000. During the last three years there was not enough fish, as a result there was a crisis and he couldn't repay. His open balance had now become Tk45,000.

Last year he took an additional loan of Tk30,000, which he repaid at the end of the season. This year (i.e. 2001), he obtained new *dadan* worth Tk20,000 for an engine (Tk15,000) and operational costs (Tk5,000). The *dadandar* is always the same one. He has to hand over his catch to the *dadandar*, who pays him approximately two thirds of the actual market price.

Mr B Das has now 1 boat (13 yards long), 12 nets (gill nets only), 1 engine. His boat is faulty at the moment; his engine needs repairing; however, he plans to start fishing in two days time and he has two labourers on the boat.

Last year (*hilsha* season 2000) his total revenue was Tk75,000, i.e. three-month income. Out of this he repaid Tk30,000 (i.e. principal). At the same time, the Tk75,000 represents only two thirds of the value of the fish he caught, since one third was kept by the *dadandar* as interest (i.e. Tk37,500). As a result, the interest for the outstanding loan, which was also Tk75,000 at the time, represents 50% over three months. As such, the monthly interest rate was about 17%.

Source: CODEC / NRI Trade Survey, July 2001

Table 20: Positive and Negative Sides of *Dadan* in Fish Marketing

Pros	Cons
<ul style="list-style-type: none"> • The fish catching and marketing system would not be as efficient as it is without the substantial amounts of credit injected by <i>aratdars</i>. Certain developments would probably not have taken place, or only at a much slower pace, without their financial involvement. • Given that “firm” business relationships are established, transaction costs such as searching for trustworthy business partners and contract enforcement appear to be comparatively low. The resulting interlocked transactions enhance the speed at which a commodity moves through its marketing channels. • Long established <i>dadan</i> relationships between traders tend to be built on trust, which again reduces transaction costs. • <i>Aratdars</i> have funded an industry which was largely neglected by formal banks and NGOs. This has provided large numbers of people in coastal areas with access to credit, which they would not have had otherwise. This has created employment and improved food security at micro and macro levels. Indirectly, the poor are likely to have also benefited due to the spin-off effects created. 	<ul style="list-style-type: none"> • There is scope for exploitation due to the mostly informal nature of the credit arrangements. In particular, fisherfolk depending on intermediary traders cum moneylenders (i.e. <i>dadandars</i>) are often exposed to dubious business practices, the rules of which can vary from location to location. • Minority groups appear to find it more difficult to stand their ground when dealing with business partners of the majority. This may include Buddhist dried fish traders who have provided advances to suppliers, or Hindu fishermen having to pay a higher interest rate on their <i>dadan</i> (i.e. through substantial reduction of selling price below market rate). • The informal credit system has the tendency to create dependency relationships resulting in increased indebtedness over time. • Due to the informal nature of the system, lenders may sometimes use violent measures to pursue their interest.

Table 20 demonstrates the different aspects of *dadan* lending in the fish marketing chain. It is obvious that there are both positive and negative sides to this business, which need to be borne in mind when planning new interventions geared at improving fisherfolk’s access to credit. A credit programme that does not fully take into account the roles of the *aratdars* may run into difficulties due to the market power the latter are able to wield.

Micro-Finance in Coastal Bangladesh – The CODEC Experience

Traditionally, it was the low caste Hindus who engaged in the fishing profession. The Hindu society is still a caste-bound society and low castes are made up of people destined to take up manual labour-based professions. The Hindu fisherfolk are one of those caste-bound communities. The population increase together with the increasing landlessness caused by erosion and nagging poverty has changed the structure of the agriculture sector and thereby also the small-scale fisheries sector. The arable land has been divided into increasingly small units, often so small that they cannot support the family. Fishing has then become the alternative source of employment, part time or full time. Small-scale fishery is seen as a last resort to earn one's livelihood. Thus, the increasing number of newcomers in the artisanal fishing sector are making the traditional Hindu fishing communities more vulnerable.

On the other hand, the coastal and riverine communities are facing serious consequences. Owing to reasons such as landlessness along with declining fish resources from open water bodies, the population is often compelled to migrate to big cities, because the employment opportunities in the coastal region are very slim. The industrialization (in a very limited way) is happening primarily in the big cities. As such the job opportunities in the small towns in the vicinity of the coastal and riverine areas are also very limited.

“ Most of the hundreds of MFIs that are providing micro finance services to the poor around the world are non-government organizations (NGOs), usually societies, trusts or foundations. They tend to have added micro finance to their earlier development oriented activities when they saw the need of their members for capital. However, strictly speaking, either the statutes do not usually permit micro finance services neither under which they are registered or the regulatory authority for financial institutions in their country, especially if the NGOs are accepting savings deposits from their clients. Yet without the micro finance activities of these small NGOs, mostly very poor households would not have access to capital for additional income-generation through self-employment.” (Financing Micro finance for Poverty Reduction: David S.Gibbons and Jennifer W. Meehan, 20 March 2002)

In Bangladesh, NGOs are also facing this critical problem, though GoB for the last few years are discussing this issue and have promised that some laws will be passed in the parliament to give a legal status to all NGOs which are actively operating Micro-Finance activities in the country.

Further, a major problem in micro finance is that the model is giving emphasis on quantity rather than quality. It is definitely understood that quality of life cannot be ensured only by economic upliftment, in that the precondition of the quality of life is also dependent on the socio-political environment of the state. Furthermore, the model does not have any exit plan with the borrowers and the respective NGOs are somehow involved in a chain of patron-client relationship. Micro-credit starts with Tk.3000 to Tk.5000 to each member without any proper scrutiny. Each year the amount increases gradually. Whether the amount is used for consumption or properly used for production

purposes - the scope of this evaluation is not existent in most of the cases. In many cases the members are going to be indebted by a bigger amount as time passes. At the same time, the NGOs also do not have any option but to continue the loan program with each of the loanee members to keep the record in good shape. Thus, the repayment rate does not necessarily indicate the impact of the credit program. Neither the borrowers nor the respective NGOs are able to find a way to phase out from this relationship.

CODEC initially started its credit program by distributing mechanized fishing boats and gradually became involved both in micro-credit as well as mid-term and long-term financing against income generating activities. CODEC also provided loans against housing in limited capacity. In some very specific cases CODEC provided loans without interest; and under a very special project CODEC provided credit to the fishers to free them from *dadan*. In January 2002, CODEC also initiated a credit program for the hardcore poor and for the well-off members of the village communities. It is too early to make comments on these two initiatives.

Micro-credit somehow helps the poor population to have less dependency on moneylenders and *dadandars* however the total elimination of exploitative money lending and *Dadan* transaction is not possible through micro-credit. This is mainly due to the fact that micro-credit definitely requires some procedures and rules, which do not allow members to borrow money whenever they badly require money. On the other hand, moneylenders and *dadandars* do often have disburseable money without following any rules and procedures.

Moreover, the very rules, regulations and procedures of the established micro-credit programmes exclude the very poor (hard-core poor) and gradually it (micro-credit program) shifts its target groups to the upper strata of the poor population and the middle class.

Sometimes, the repayment schedules are also not feasible to the borrowers as most of the poor people are somehow dependent on the fishing season or availability of work. Even the loan money invested in a profitable project does not secure regular flow of money for repayment in accordance with NGO rules.

Dadan-Free Loan

Nowadays, virtually, the fishers have to depend on the monoculture of *hilsha* fishing in the Bay of Bengal during mid-June to mid-November. The next four months (mid-November – mid-March) they barely earn their livings from the fishing of *Bombay duck* and small shrimps in the coast of the Bay.

During the following three months (mid-March – mid-June), they have hardly any earning source, because the sea cannot support them during the period due to gradual depletion of fish for various obvious reasons and also because of 'reduced catch per unit effort'.

During the above three months (mid-March – mid-June), they either borrow from the usurers at an exorbitant rate of interest or buy their food and other daily necessities from the local shops on credit. In most of the cases, at the outset of the *hilsha* fishing season (May – June), they have to take resort to the *dadandars* for loan. At that time, this loan is urgently required for making their fishing gears ready for *hilsha* fishing in the ensuing season. For this fishing season, their investment on one boat ranges from Tk100,000 to Tk120,000 and they usually avail *dadan* to the extent of Tk10,000 to Tk70,000 in a season for meeting their fixed and working capital requirements.

It may be pointed out here that the typical usury rate of interest varies from 120% to 240% per annum. On the other hand, *dadan* is a sort of monopsony transaction that is built upon a highly skewed lending contract in favour of the lender to sell the produce (here the catches) to him/her at a price much lower than that of the normal market (usually 20% - 40% below the normal market price).

With the abovementioned situation in view, CODEC initiated its Savings & Credit Programme to meet the aforesaid requirement of credit of the poor fisherfolk/coastal communities and to bring them out of the clutches of the informal credit market. However, despite working over a decade among the fishing communities of Chittagong, CODEC felt that it has not yet succeeded to free most of the fishers from the clutches of the *dadandars* and usurers. Most of these years CODEC could support them with its micro-credit products of Short Term Loan (STL) for one year with an average loan size of Tk10,000 and Mid Term Loan (MTL) for two years with an average loan size of Tk30,000.

From the above realisation, during May and June 1997, CODEC introduced another credit product, named **Dadan-free Loan** (usury-debt redemption loan), on pilot basis for freeing some of the Chittagong fishers from the clutches of the *dadandars* and usurers. CODEC extended such loans to 110 members of the CODEC supported VOs (Village Organisations) of its Chittagong Area within a range from Tk20,000 to Tk70,000 for a period of two years from its own Loan Fund under the following terms and conditions:

- The amount of *dadan* and/or usury loan of the referred borrowers would have to be repaid to the respective lender(s) immediately after loan disbursement in presence of at least two appropriate representatives from the concerned Loan Committee and the concerned Centre/Branch and they should submit a certificate in this respect. Such repayments must also be acknowledged by the respective lender(s), and the concerned borrowers should be declared free of any *dadan* and/or usury loan. The respective borrowers should also ascertain that they would not resort to *dadan* and usury loan at least during the tenure of CODEC loan.
- To get rid of further *dadan* and/or usury loan, the proposed MTLs (Mid Term Loans) can be disbursed without Security Deposit in cash. But, in terms of proposal of the concerned organisations, the MTLs should be made secured with mortgage of the borrowers' movable and immovable properties as described in the said borrowers' profiles.

The program was aimed to cover 450 fishers, which is about 10% of the total fishers covered under Chittagong Area of CODEC.

The experience of “*Dadan-Free-Loan*” and Micro-Finance

The “*Dadan Free Loan*” gives the option to the fishers to sell their catches by their own, have the opportunity to bargain and thus, allow them to receive higher prices. But for their very urgent need (e.g. loss of fishing gears and catches in the sea due to piracy) in a few cases, they had to borrow money from the *dadandar* again. In some instances they just for social security take money from *dadandar*, which is not possible to obtain from any organization. Moreover the *Dadan Free Loan* was provided to the minority Hindu Community in Chittagong area, where every day they are facing the severe problem of piracy and losing their fishing nets, engines and fishes. This piracy which is increasing every day in the fishing ground is becoming a severe constraint for the fishers to repay the big loans.

Micro –credit may be an option to those people for survival, but in many cases difficult to self-sustain. In most cases, micro credit is used in non-productive purposes or for consumption. On the other hand, many NGOs are operating in the same region, which is creating an unhealthy competition among the NGOs. As a result, the members of the rural populations are taking advantage from the situation. Ultimately they are going to be more indebted day by day. In a recent CODEC study it was pointed out that one of the reasons of migration from rural areas to the cities was due to indebtedness to different NGOs.

As the same group members are taking loans from different NGOs, in most of the cases the money is used for non-productive or consumption purposes which do not allow them to repay the loan as per schedule. As a consequence, the debt burden is becoming heavier on a daily basis and the pressure from their fellow members and the NGOs worker compels them to flee their respective villages.

The result of micro-credit in the coastal & riverine areas is not good for most of the NGOs and even for Grameen Bank. CODEC, from its inception is trying to address some of the problems by introducing different types of loan products. Nevertheless, owing to the absence of clear laws and regulations by GoB, most of the time CODEC was compelled to compete with others just to stay in the arena, which hampers to initiate innovation as well as to attain the need of the coastal and riverine populations.

Loan Status of CODEC

The summary of the loan status of CODEC as at June 2002 was as follows:

Total Loanees:	137,305
Total Savings:	Tk.59, 946,451
Total Outstanding:	Tk.143, 418,966
% Of recovery rate:	93%

Findings from Other Studies on the Impact of CODEC's Savings and Credit Programme (Micro Finance):

- On the whole, the Savings and Credit Program of CODEC brought positive impact upon the lives of its target people. Most of them have not only succeeded in arresting the deterioration of their economic situation. Instead, they have achieved their household economic security and some of them even attained vertical mobility (upward) in terms of their asset acquisition and income-expenditure pattern.
- Positive impact has also been visualized in terms of their (i.e. the borrowers') food-intake, clothing and housing. Compared to their early life before their association with CODEC they can now spend more on these basic necessities of life. These have been possible due to their enhanced income through the "Savings and Credit" intervention of CODEC.
- Their (the borrowers') loan availability has been smoothened. Nowadays, they don't have to depend much upon the village moneylenders. Incidences of *dadan* have also been reduced to a substantial extent. Compared to other NGOs in the locality, they can borrow a higher amount of loan that roughly corresponds to their requirements. In terms of loan tenure, their repayment of loan is also high, although they cannot always repay as per repayment schedules due to high seasonality and extreme uncertainty of their income stream.

Despite the above positive impact, the study also pointed out the following weaknesses of the Savings and Credit Programme of CODEC in the referred area:

- Sometimes the borrowers of CLF (CODEC Loan Fund) do not utilize their loan amount properly. Assessment of their loan requirement is not also done properly.
- Although, most of the time, the borrowers repay their loan within the period of the loan (i.e., within loan tenure), they often fail to repay installments on time. Both repayment and realization effort, as per installment, is very weak.
- In some of the cases, the female loans of the VO members go to their male counterparts. There is no wrong in investing the money jointly. But, many women have virtually no control upon utilization and management of their loans. This rests upon their husbands, sons or fathers.
- The seasonal variations and uncertainty of income of the target people adversely affect their IEGAs (Income and Employment Generation Activities). So is the case with loan repayment.
- The target people, as well as the CODEC personnel do not give much impetus to the social development programmes of CODEC. They are mostly interested in the economic development programme. But, it is to be understood that only income

generation is not enough. Arresting the erosion of income is also very important for the overall development of the target people. At least, here lies the importance of social development activities of CODEC.

Some more problems of the present state of Micro Finance in the context of the experiences of CODEC:

- The income of our target people is totally dependent upon the seasonality of their profession and it is characterized by a very high degree of uncertainty. Moreover, their income stream is very irregular and during a substantial period of the year they either suffer from absolute unemployment or disguised unemployment. As a consequence, it is very difficult for them to repay their loans regularly as per their respective repayment schedules.
- The target people are virtually dependent upon fishing in the estuaries of the nearby rivers and the Bay of Bengal. But, day-by-day, they are facing "reduced catch per unit effort" due to increasing pressure on this resource. On the contrary, there is very scanty scope for alternative income and employment generation opportunities for them. As a result they fail to repay their loans regularly.
- The CODEC target people are living in the severe disaster prone areas of Bangladesh. Almost every year, they face natural calamities like cyclones and floods, which seriously jeopardize their income and living. These factors impact negatively upon the repayment of loans.
- The target people are also the helpless preys of piracies in their fishing grounds. They also face theft and epidemic of their cattle and poultry. This situation also counts down upon their income and repayment of loans.
- The CODEC command areas are virtually outreached for everybody. As a consequence, the cost of operation of their Savings and Credit Programme is quite high.
- The increasing pressure on attaining and keeping financial self-sufficiency of the programme, and sustainability of the organization as a whole, systematically excludes the "poorest of the poor" from the umbrella of the Micro Finance Programme for its obvious reasons.
- Our target people often need emergency loans, both for consumption purpose (food and clothing requirements during lean season, marriage of daughters & sons, house repairing, medical treatment etc.) and working capital financing for loss of assets (due to piracy, theft, epidemic of cattle & poultry etc.) during the tenure of an ongoing loan.

Since they are not allowed to multiple loans, they have to resort to the traditional moneylenders and/or *dadandars* to meet their emergency need of finance. This seriously affects their loan (CODEC) repayment.

- Sometimes due to lack of proper management ability, some borrowers are provided with loans larger than their actual requirement for their respective IEGAs (Income and Employment Generation Activities). As a result, a portion of the loan amount goes to feed their consumption needs.

Later on, they often fail to repay their loans in time. In some cases, they repay the CODEC loans by borrowing from the usury sources at high prices. This seriously endangers their sustainability. Even, in some cases, if they are under severe pressure from the debt collectors, sometimes they migrate to the big cities in search of income opportunities.

- Now, in consideration of financial self-sufficiency of the programme and sustainability of the organization as a whole, there is an increasing trend / demand to include the people in the programme, who are not considered as target people of CODEC.
- The management requirements of micro finance can undermine relationships and capacity to engage social mobilization. It is difficult for the same person to be both 'social mobilizer' and debt collector. The disciplines and practices of the one are at odds with the other. Micro-finance is concerned with economic empowerment of an individual; while the social mobilization Programme deals with the group and its socio-political development.
- The default of loan repayment seriously endangers group cohesion and its social development activities.

Key Findings

- The hardcore poor (estimated at 20% of the coastal population) do not have access to formal or informal credit;
- Micro-finance schemes are often not appropriate for coastal communities;
- High opportunity cost of capital in informal sector (e.g. 5-15% interest per month in the informal sector; this is also reflected in *dadan* transactions between traders and fishermen who do not have access to formal credit).
- Even large-scale operators in the community chain (e.g. *Aratdars*) do not have easy access to bank credits due to unfriendly procedures, collateral arrangements etc.

COASTAL LIVELIHOODS AND INSTITUTIONS

This section will provide an overview of the institutions involved in marine fisheries matters at national and local levels, and then analyse the principal institutional constraints encountered during fieldwork.

Organisations involved in Coastal Development

At the national level, The Ministry of Fisheries and Livestock (MOFL), which was created in 1985 when the Fisheries Division and Livestock Division were carved out of the Ministry of Agriculture, is primarily a policy making agency (Habib, 1999). The principal Government institutions responsible for regulation, management, and development of fish production from inland, coastal and marine resources are the Department of Fisheries (DoF), Bangladesh Fisheries Development Corporation (BFDC), and Bangladesh Fisheries Research Institute (BFRI).

At the same time, according to Habib (ibid), “The unclear DoF mandate does not adequately define the tasks and the demarcation of areas of responsibility in relation to those of sister agencies such as BFDC and FRI has resulted in the overlapping and conflict of programs. These are manifestations of lack of coordination and unhealthy competition. The regulatory situation postulates that, as the marine wing, the DoF is required by the MFO to manage the coastal and marine fishery resources and therefore, the duty to conduct research also falls within the domain of the DoF. The situation is obviously causing the underdevelopment of other institutions.” Furthermore, according to the same source “The present structure is also incomplete in the sense that many key functions are either absent on the organogram or, if they appear on it, are not being followed. For example, although there is normally a “Research, Training, Project Planning, Evaluation, and Statistics Unit”, none of the tasks expressed in its title seem to be actually carried out. There is also a Fisheries Extension Section, but the absence of an organized extension system and the lack of appropriate training for district and *thana* fisheries officers constrain and hamper field operations”.

The local government structures, also intended for the coastal villages in Bangladesh are the various departments in an upazilla administration under an executive officer of the government known as the Upazilla Nirbahi Officer (UNO). The departments include: Agricultural Extension, Fisheries Extension, Rural Development, Health Complex/Centre, Land Settlement, Education Extension, Family Planning, Cooperative, Social Welfare, Special Project and Police Station etc. Besides, some other government departments like Relief and Rehabilitation, Meteorological Office, Water and Power Development Authority (WAPDA), Rural Electrification Board, Local Government Engineering Department (LGED), Public Health Engineering (PHE), National Economic Council (NEC), etc. are also responsible for transformation and rural development of Bangladesh. In every union and village there is a local government authority, which is the authority and means for rural development.

There are only a few social organisations that play a somewhat positive role for the poor. On the other hand, the religious organisations and their leaders often play a negative role through a campaign against the NGOs' development activities and female participation in the various livelihood activities.

The NGOs like Proshika, BRAC, ASA, Grameen Bank and others have poverty-focussed programmes for the poor people. However, only a few NGOs including CODEC and other members of COFCON (Coastal Fisherfolk Community Network) are involved only with the coastal communities. The NGO activities are centred on organising the poor into their own organisations, providing non-formal children education & adult literacy, awareness and skill development training, micro-finance, health & sanitation, safe drinking water, legal awareness & support etc. and to play an advocacy role to eradicate poverty.

Nevertheless, the NGO activities also have their many limitations. On the one hand, they cover only a small number of the coastal poor; and on the other hand the role of the government and its activities cannot be substituted by them (NGOs).

Amongst the bilateral donors, it is primarily DANIDA, DFID, The Dutch Embassy and the Japanese Government that provide support to the coastal areas in one form or another. In addition, the multi-lateral organisations like FAO or Asian Development are also active in the coastal belt.

Institutional Constraints

“Poor governance and weak institutions are the most important development constraints” (Bangladesh: Country Strategy Paper, DFID, 1998). The Local Government as a political institution to ensure public participation in development activities is yet to take proper shape in Bangladesh.

“ Most administrative decisions still remain to be taken centrally.... Several attempts have been made at decentralization, but the system has remained highly centralized. As of such local bodies are characterized by weak administrative capacity, a limited financial and human resource base and little public participation.” (Ahmed S.G. 1997: Local Government System in Bangladesh, Empowerment, Participation in Bangladesh: University of Dhaka)

In the context of the coastal communities it should be understood that poor representation of the coastal communities in the power structure do not allow them to reflect their problem and issues in the main stream. The Union Parishad is the only place where the community may raise their issues and in most of the cases the Union Parishad do not have enough power or resources to address or serve the people's needs. Union Parishad is primarily involved in distribution of wheat against Food For Works.

Although the Union Parishad can play a vital role for the development of their respective areas and people, that requires proper structural adjustments and also a decentralized authority to the Parishad.

Thus the formal institutions are not functioning properly or in most cases those are ornamental. In this context, the formation of non-formal institutions arises. Most of the NGOs are engaged in forming such informal institutions in different forms and dimensions. CODEC, thus, in all its command villages formed Village Organizations (VOs) for male, female and children. The Male and Female organizations also formed apex Organisations called Coordination Committees comprising representatives from 60-80 Village Organizations in each field level CODEC Branch. Through these Coordination Committees CODEC is trying to activate some of the very important institutional issues, which are in most cases linked with their political and social rights. Through policy advocacy campaign these Coordination Committees are trying to raise their voices at different levels.

The long –term aim of CODEC is to see that Coordination Committees have organized themselves into the decision making process at least at Union Parishad. By building the platform of empowerment, it is anticipated that the institution will be able to act as a successful pressure group for their communities and members in the local socio-political context. At least by Policy Advocacy these institutions will be able to raise their voices-if not to the central level but to the local levels (Union & Upazilla)

Coordination Committees need to have legal status under the government regulation. It will uplift its empowerment through legal reorganization and status. The legal status will accelerate the capacity of the Coordination Committee to address greater issues of their communities and create opportunities for linkage and network with related government and non-government agencies.

Those Coordination Committees are also facing legal problems. To be registered as formal institutions, the prevailing laws in Bangladesh are not favourable to their needs and causes. All these laws are regulatory in nature and not aimed at assisting these grass-root level organizations to grow up or to work towards their socio-political and economic development. It is also to be understood that if the Government does not have a clear agenda regarding these non-formal organizations, it is difficult, or in most cases not possible, to reach the ultimate goal of building sustainable institutions for the disadvantaged poor of the coastal area of Bangladesh. Policy Advocacy may play a pivotal role to address these issues.

The experience of CODEC shows that, to establish viable institutions at the grass-root level, the village organizations also require to practice democracy and transparency at primary member's level. The external factors in most cases hamper such practice. It is understood that the overall situation of the state necessarily imposes the pre-conditions for such situation.

The Linkages between the Strategies of the Poor and Policy Processes

It has been opined and observed that the policies concerning coastal communities are not often rooted in ground realities and the policy formulation process is too remote and inaccessible for the communities concerned, although participation of the stakeholders in that process is all the more necessary for proper formulation and implementation. Consequently, the existing policies and processes address the issues of poverty improperly and inadequately.

It has been observed in the coastal villages that the inadequate policy processes are actually criminalizing the poor. For example, for adoption of survival strategy due to abject poverty, the poor people are being forced to fish *jatka* (the juvenile *Hilsha*) with *current jaal* (monofilament net), although catch of *jatka* and use of *current jaal* is totally banned. Since there is no other alternative, and immediate survival is the natural priority for the poor, they are increasingly getting involved in this type of destructive fishing at the expense of their livelihood sustainability in the long term. In this process of criminal acts, they sometimes lose their assets like nets and the catches, whenever the police force comes in to destroy those assets. Sometimes they can save their nets and catches through bribing the police. Even the fish vendors have to bribe the police and market authority to get permission to sell *jatka*. As a result, the inadequate policy process not only criminalizes the poor, it also further marginalizes them even in the short run. The same is the case of shrimp-seed collection, which is going on unabated.

However this sort of policy process not only criminalizes the poor, it also criminalizes the policy implementers (police & the concerned people) as well as the well-off business persons, since they are involved with selling of the banned nets or threads of it. The government is contemplating banning of destructive nets like ESN, Push Net etc. However, in the absence of sustainable alternatives, this type of policy will have an adverse immediate impact on the livelihoods of the poor.

Last but not least it needs to be highlighted that the poor members of coastal communities have only very limited access to justice. The increasing piracy in coastal areas is a clear sign of the sore state of the law and order situation in these parts of the country. The same applies to other aspects where the poor lack safety, security, and access to justice. As a consequence, a more accessible justice system that takes into account the needs of the poor is urgently required.

Appendices

Appendix 1: Tables and maps prepared as part of the PRAs, including wealth ranking, seasonal calendars, commodity chains, and price information.

Appendix 2: Overview of the Sustainable Livelihoods Approach

Appendix 3: List of scientific, Bangla and English fish names

Appendix 4: Bibliography

Appendix 1: Tables and maps prepared as part of the PRAs, including wealth ranking, seasonal calendars, commodity chains, and price information.

Wealth Ranking
Latifpur Village
Chittagong

Category	No of Household	Condition of House	No of Boat+Engine	No of Net	Capacity Children Education	Capacity to go to doctor quicly	Savings at bank	Land 2-10 decln	Color television	Paikar/ Dadandar	Service/ Job
1 Big	17,29,30 34,35,37 60,61,85 69,86,101	Good	2 each	10	Yes to high school	Yes to MBBS doctor	Yes little amount	Yes	Yes	Good capital	No
2 Middle	1,3,4,8, 14,16,19 21,23,26 32,36,38 39,41,46 47,50,55 56,57,69 63,66,68 71,74,76 77,78,79 80,81,85 87,90,91 93,94,95	Not good	At least 1	10	Yes to primary school	Take time	No	No	Black & Whit	No	Yes
3 Small	2,5,6,7,9 10,11,12 13,15,18 20,22,24 25,27,28 31,33,40 42,43,44 45,48,49 51,52,53 54,58,62 64,67,70 72,73,75 82,83,84 88,89,92 96,97,98, 99,100	Smal & hut	No		Yes to NGO School	No (Only to Homeopath)	No	No	No	No	Fish sale

Wealth Ranking
Village: Hatkholapara
Cox's Bazar

Rich	Moderately rich	Middle class	Moderate poor	Poor
<p># They have land up to 12 acor decimal # They have fishing boat boat at least 3 # Brick-built house at Cox's Bazar # Businessmen # Have color TV # 100% Education to family members # they can avail treatment home and abroad</p> <p>No of Household: 3</p>	<p># They have land up to 5 acor # Businessmen # They have Hook boat at least two # House tin shed and mud wall # Have TV # 70% Educated: 35% Upto SSC & 35% upto VIII # they can avail treatment home and abroad</p> <p>No of Household: 17</p>	<p># They have land up to 3 acor # Fish Business # They have tempoo boat # House tin shed and bamboo wall # 5% Have TV # 50% Educated: 15% Upto SSC & 35% upto VIII # they can avail treatment Cox's Bazar</p> <p>No of Household: 19</p>	<p># They have only homestead # Fish Business # They work as day labour # 20% Educated: upto class five # they can avail treatment at Khuruskul # House bamboo wall and straw shed</p> <p>No of Household: 62</p>	<p># Very poor existence of homestead # Livelihood depends on donation and others help # They don't have any sorts of wealth # Children can not go for education They don't have any ability for treatment</p> <p>No of Household: 9</p>

Wealth Ranking
Village: Panjupara
Kuakata
Patuakhali

Rich (Dhani)	Middle class(Majari)	Moderate poor (Motamuti Sachaal)	Poor
<p># At least 1862 decimal land # At least 500-600 mond paddy produced # Secured Livelihood # Savings at bank at least taka 7-8 lakh # Electricity and TV at home # House at Alipur Bazar # Social influence # Children can go to college and university # Can go to Dhaka, Chittagong even foreign for treatment. # Can help mosque madrasa etc.# Have arat and invest money as dadan # Wear expensive dresses # Have expensive furniture</p> <p>No of House hold:8</p>	<p># At least 532 decimal land # At least 200 mond paddy produced # Secured Livelihood # Savings at bank at least taka 50-60 thousand # Most of them haver color TV at home # House at Kuakata Bazar # Social influence # Children can go to Kolapara college # Can go to Dhaka, for treatment. # Can help small amount mosque madrasa etc .# Some of them are service holder # Some of them have grossary shop</p> <p>No of House hold: 50</p>	<p># At least 5 Kora- 4 Bigha land # Can continue 2-3 months by own rice # Most of them have Dingi boat and 2 net # Children can go to school up to class five # Can go to Mohipur to Upazila health complex for treatment. # Food is secured whole the year by their earnings # Some of them have Pan shop .# Dress is not very good # 90% fishermen</p> <p>No of House hold: 92</p>	<p># Live at khash land and don't have own land # Labour at agriculture field & boat # 10% people of this catagori have net and dingi by dadan # Some times they have to fast # Some women catch Pona # Can not go to doctor for treatment # Children can go to Maktob # Men wear lungi cost taka 80 # Women wear Shari cost taka 100. # Shari not more than 2 and one shirt and 2 lungi for women.</p> <p>No of House hold: 44</p>

Wealth Ranking
Village: Lebukhali
Patuakhali

Rich (Sachhaal)	Middle class(Samannya garib)	Middle poor (Modhya garib)	Poor	Very Poor
<p># They have land up to 266 decimal</p> <p># Have capital</p> <p># They have net and boat</p> <p># Can go to Barishal and can pay up to Taka 200 hundred as fee</p> <p># Can invest money with interest</p> <p># Work as dadandar, aratdar & Paikar</p> <p># they can continue only whole year by their own production can store for future</p> <p># Children can go to school up to SSC</p> <p># Can wear good cloths</p> <p>No of Household: 23</p>	<p># They have land up to 40 Kora</p> <p># Some of them work as day labour</p> <p># Have small capital</p> <p># They have net and boat and catch fish six months</p> <p># Most of them work to others boat</p> <p># they can continue only nine months by their own production</p> <p># Children can go to school up to class eight</p> <p># Can go to Dumki for treatment</p> <p>No of Household: 7</p>	<p># They have land up to 30 Kata</p> <p># Some of them work as day labour</p> <p># Don't have capital</p> <p># Some of them have net and boat</p> <p># Most of them work to others boat</p> <p># they can continue only six months by their own production</p> <p># Can go to school up to class five</p> <p># Can go to lebukhali health complex</p> <p>No of Household: 11</p>	<p># Very few land for cultivation and have own house</p> <p># They have land up to 20 Kora</p> <p># Few of them have net and boat</p> <p># Most of them work to others boat</p> <p># they can continue only three months by their own production</p> <p># Can go to school up to class five</p> <p># Can go to lebukhali health complex</p> <p>No of Household: 11</p>	<p># No land stay at khash land</p> <p># Work as labour in others boat and land #</p> <p>Childrens can go to primary school without tution fees #</p> <p># Can go to lebukhali health centre (Govt.) but can not purchase medicine</p> <p># Some times have to starvation</p> <p># Face problem for cloth purchase</p> <p>No of Household: 22</p>

Wealth Ranking
Village: Debraj
Upazilla: Morelganj
Bagerhat

Rich (Mohajan)	Middle class(Madhyam gerostha)	Well Off (Sachaal)	Poor	Very Poor
<p># At least 20 Bigha land # At least 4 cow for cultivation # Well business # Secured Livelihood # Savings at bank # Electricity and TV at home # Engage labour for Cultivation and fishing # 25 Bigha shrimp pond # Children can go to college and university # Can go to Dhaka for treatment.</p>	<p># At least 5 Bigha land # 2 cow for cultivation # Small and collective shrimp pond # Can earn well for fooding and clothing for one year # TV at home # Children can be matriculate # Can go to Khulna for treatment # Little amount of money at bank account # Net and boat.</p>	<p>1-2 Bigha land #Most of the people do not have agriculture land # Most of the people have net and boat # Can not cultivate paddy for whole year # At least 6 month have purchase rice # Can continue daily life by fishing or business # Can matriculate the children # can go to Bagerhat for treatment.</p>	<p># No cultivating land except home # Few people has net and boat # Daily fishing for food purchase # Children can go to primary school # For treatment can go to village doctor # Some times can go to Bagerhat for treatment # They have to borrow.</p>	<p># No land except home # Work as labour in others boat # Mainly continue the livelihoods through fishing by Jaki net # Some times have to fast # Childrens can go to primary school without tution fees # Have to struggle for treatment # Can go to village doctor.</p>

Wealth Ranking
Village: Kulla
Satkhira

Rich ((Sachaal))	Middle class(Majari)	Poor
<p># At least 5-10 Bigha land # Can run whole year by production # Some people have shrimp pond # Well income # Capable to educate the child up to SSC # Can go to Satkhira for treatment # Have TV & good furniture</p> <p>No of Household: 13</p>	<p># At least 1-4 Bigha land # Can buy food after whole year income # Small business # Most of the people have boat and net # Can educate the children up to class nine # Can go to Budh hata market for treatment</p> <p>No of Household: 17</p>	<p># No cultivating land except home # Few people has 5-10 Kata landt # Can not purchase food whole the year so they have to fast # Children can go to primary school # Can not take proper treatment</p> <p>No of Household: 55</p>

Seasonal Calendar
Latifpur
Chittagong

Particulars	Balahakh April-May	Jalstha May-June	Ashar June-July	Srabon July-Aug	Bhadra Aug-Sept.	Ashin Sept-Oct.	Kartik Oct.-Nov	Agrahala Nov-Dec	Poush Dec-Jan	Magh Jan-Feb	Falgun Feb-March	Chaitra March-April
Gill Net Hilsha			000 00	0000 0000 00	0000 0000 0000	0000 0000	0000					
SBN Bombay Duck, Small Shrimp, Different spices rarely found	00 Bombay Duck	00 Bombay Duck					0000 0000 0000 0000	0000 0000 00	0000 0000 0000 0000 small shrimp	000 000 000	0000 00	000
Mashari net Shrimp Fry	000000 000000 0000 50% hindu & Muslim	000000 00					00	00	000000 000000	000000 000000	0000 0000 Low price	0000 0000 Low price
Wage laboring Ship-breaking, helper of meshon, earth work etc.	0000 00 10% family engaged										000000 000000 0000 20% family engaged	000000 000000 15% family engaged
Marrige	0000							000000 0000		000000 000000 0000	000000 0000	
Want of Cash & Credit	000000 000000 0000	000000 0000										
Financial criels	000000 000000 00	0000						00	0000	0000 0000	000000 000000 0000	000000 000000 0000
Disease diarrhoea, fever, micelle skin disease	000000 00										000000 000000 0000	000000 000000 0000
Religious Festival				000000 000000 Monosha Puja	00	000000 000000 0000 Durga Puja	000000 000000	0000	0000	0000		000000 000000 0000

**Seasonal Calendar
Panjupara-Kuakata
Patuakhali**

Particulars	Baishakh April-May	Jaistha May-June	Ashar June-July	Srabon July-Aug	Bhadra Aug-Sept.	Ashin Sept-Oct.	Kartik Oct.-Nov	Agrahain Nov-Dec	Poush Dec-Jan	Magh Jan-Feb	Falgun Feb-March	Chaitra March-April
Gill Net Hilsha	000 000	000000 00	00000 00000	0000 0000 0000	000000 000000 0000	0000 0000 0000						
Dora Net Juvenile Hilsha							0000 0000 0000	0000 0000	000000 000000 0000	000000 000000 000	000 000	000
Dry Fish Shark, Pompret Falsa, Korai, Shrimp Bombay duck, Ribbon etc.						0000 0000	0000 0000	000000 000000	000000 000000	000000 000000	000000 000000	000000 000000
Dati+Ber Net Topse, Poma, Bele, Falsa, Kata, Chapila Khorsul, Shrimp, Korai Bhol, Ribbon etc.						0000 0000 0000	0000 0000	000000 000000	000000 000000 00	000000 000000	000000 000000	000000 000000
Mashari net Shrimp Fry	00000	0000	0000	0000	0000	0000	0000	000 000	0000 0000 0000	0000 0000	000000 000000 0000	000000 000000 0000
Disease									0000 0000 Skin disease		000000 000000 0000 Diarrhoea	000000 000000 0000 Diarrhoea
Boat and Net Making & Repair For Hilsha	0000 0000 0000											000000 000000 0000
Dora and Moshari Net & Boats Repair and making						0000 0000	0000					
Wage laboring Paddy field	000000 000000 0000 Aaus	0000	000000 000000 0000 Amon	000000 000000 0000	000 000	0000	0000	000 000	00000 00000 000 000 Amon	0000 0000		0000 0000 Aaus
Wage labouring Winter Vegetables and others	000000 000000 0000	000000 000000 0000					00000	000000 000000 0000	000000 000000	000000 000000	000000 000000	000000 000000 0000
Marriage										000000 000000 0000	000000 000000 0000	
Want of Cash & Credit For Hilsha	000000 000000 0000					000000 000000 0000 For Dry Fish	0000 0000 Agriculture & Other Net	0000 0000 Agriculture & Other Net				000000 000000 0000 For Hilsha
Credit availability From Dadendar For Hilsha	0000 For Hilsha					0000 0000 For Dry fish						0000 For Hilsha
Credit Availability From Usery money lender 10% Interest P.M	000 000 For Hilsha					0000 For dry fish	000 000 For Agriculture					
Availability of Own Capital and Krishi Bank	00 For Hilsha					0000 Dry fish	000 000 Agriculture					
Food availability	000000 000000 0000	000000 000000 0000	000	000000 000000 0000	000000 000000 0000	000000 000000 0000	0000	000 000	000000 000000 0000	000000 000000	00	0

Seasonal Calendar

Lebukhali
Patuakhali

	Baishak	Jaishtha	Ashar	Srabon	Bhadra	Ashin	Kartik	Agrahaian	Poush	Magh	Falgun	Chaitra
Hilsh Catch	000	0000 0000 0000	0000 0000 0000 0000	0000 0000	0000 0000 0000 0000	0000 0000 0000						
Jhatka Hilsha					0000 0000 0000 0000	0000 0000 0000			0000 00	0000 0000	00	
Barshi: Aler, Rita, Poma, Ramchosh, Tengra, Boal, Pangash, Ghagra, Shrimp	0000 0000 0000 0000	0000 0000 0000	0000 0000 Rita	0000 00			0000	0000 0000			0000 0000 0000 0000	0000 0000 0000 0000
Maia Net: Shrimp (Small and Galda)							0000 0000	0000 0000 0000	0000 0000 0000 0000	0000 0000 0000	0000	
Agriculture: Paddy, Chilli, Poteto, Kheshari, But dal Aus	0000 0000 0000 Aus	0000 0000	0000	0000 00	0000 0000 0000 0000 Aus & Aman	0000	0000	0000 00	0000 0000 0000 0000 Aman	0000 0000 0000 0000 Ckilli etc.	0000 0000	0000
Scarcity	0000 0000		0000 0000	0000 0000		0000	0000 0000 0000 0000					0000 0000 0000 0000
Income	0000	0000 00	0000 0000 0000	0000	0000 0000 0000 0000	0000 0000		000	0000 0000 0000 0000	0000 0000 0000 0000	0000 0000	
Demand of Credit	0000 0000 0000 0000						0000 0000 0000					000
Marriage	0000 0000									0000 0000 0000 0000	0000 0000 0000 0000	
Disease	000 000	00 00									0000 0000	0000 0000 0000 0000

Seasonal Calendar
Union : Panchakaran
Upazilla: Moreiganj
Bagerhat

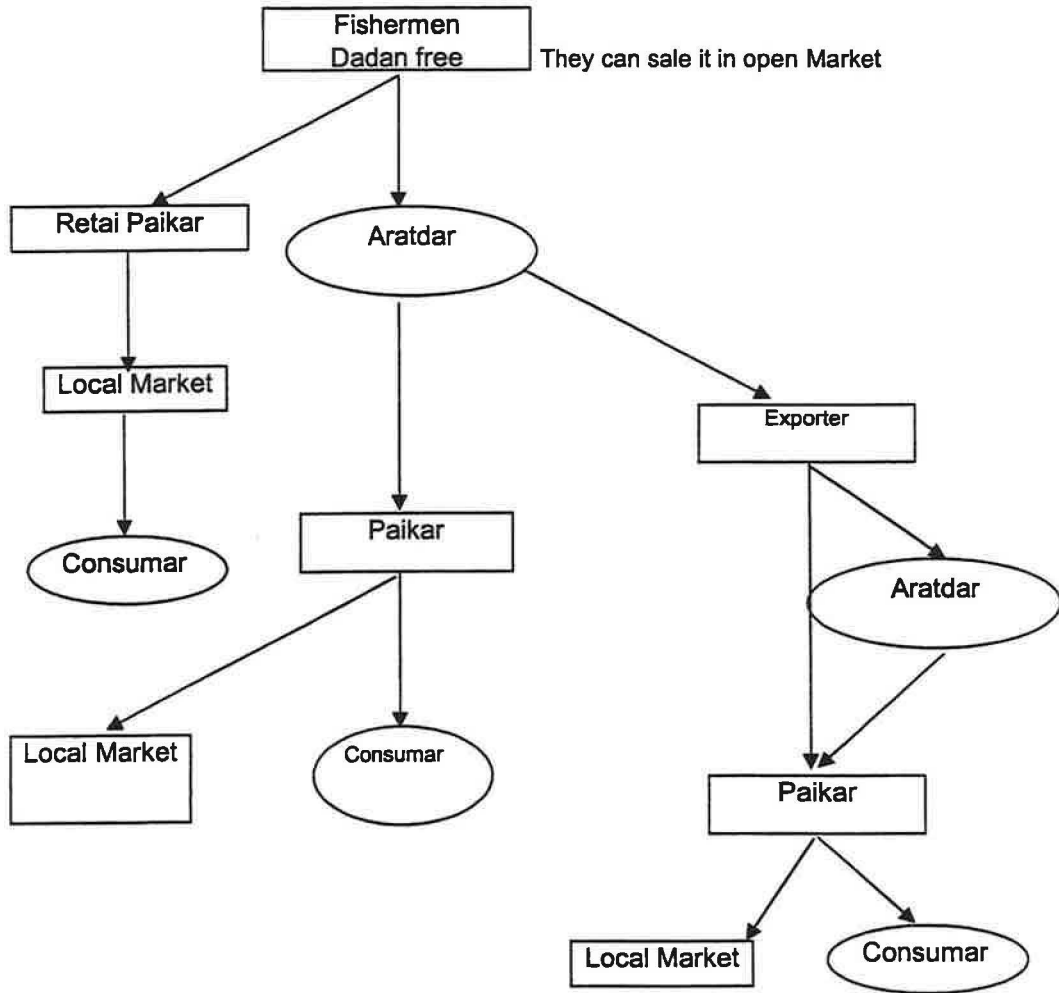
Particulars	Baisakh April-May	Jaistha May-June	Ashar June-July	Srabon July-Aug	Bhadra Aug-Sept.	Ashin Sept-Oct.	Kartik Oct-Nov	Agrahala Nov-Dec	Poush Dec-Jan	Magh Jan-Feb	Falgun Feb-March	Chaitra March-April
Shrimp (Chali)	00	0000	000000 000000 0000	000000 000000 00	000000 000000	000000	0000	00				0
Shrimp (Bagda)		00000	000000 000000 0000	000000 000000 0000	000000 000000	00						
Shrimp (Harina)		000	0000	000 000	00000 00000	000000 000000 0000	000000 000000 00	0000 0000	00			
White fish (Patari, Tengra, Bele, Faisa)			000	0000 00	0000 0000	000000 000000	000000 000000 0000	000000 000000 0000	0000 0000	00		
Paddy cultivation (Amon, Rajasail, Balam)		0000 Cultivation	0000 0000 Cultivation	000000 000000 00	000000 000000 0000	00	000000 000000 0000	000000 000000 0000	000000 000000 0000	000000 000000 0000		
Crisis							000000 000000 0000	000000 000000 00	000000 000000 For fishermen	000000 000000 00	000000 000000 0000	
Income of fishermen		00000	000000 000000 0000	000000 000000 0000	000000 000000	000000	0000	00	0			0
Income of farmer	000000 000000 0000	000000 000000 0000	000000 000000 0000	000000 000000 0000	000000 000000 0000	000000 000000 0000		000	000000 000000 0000	000000 000000 0000		
Disease diarrhoea, fever, micelle skin disease	000000 000000 000000 Gastric											000000 000000 0000
Want of Cash & Credit	000000 000000 0000 Fishermen	000000 000000 00 Farmer	000000 000000 0000 Farmer	000000 000000 0000 Farmer					000000 000000 0000 Shrimp Culture	000000 000000 0000 Shrimp Culture	000000 000000 0000 Fishermen	000000 000000 0000 Fishermen

Seasonal Calendar
Kulla
Aasuni, Setkhira

Particulars	Baisakh April-May	Jaistha May-June	Ashar June-July	Srabon July-Aug	Bhadra Aug-Sept.	Ashin Sept-Oct.	Kartik Oct-Nov	Agrahain Nov-Dec	Poush Dec-Jan	Magh Jan-Feb	Faigun Feb-March	Chaitra March-April
ESBN (Chali shrimp, Crab, Bagda Vetki, Parse, Tengra Bhola & Taposi)	0000 0000	0000	000000 000000 0000	000000 000000 0000	000000 000000 0000	000000 000000 0000	000000 000000 0000	000000		000000 0000	000000 0000	000000 0000
Charpata Net (Tengra, Golde)					0000	000000	000000 000000 0000	000000 000000 0000	000000 000000 0000	000000 000000 0000	0000	0000
Bechari net (Bhola, Topse, Tengra, Golde, Crab)	000000 00	0000 0000	0000 0000	0000	0000	0000	000000 000000 0000	000000 000000 0000	000000 000000 0000	00000 00000		
Paddy cultivation Amon			000000 000000	000000 000000	0000 0000	0000 0000	000000 000000	000000				
Paddy cultivation Iri	000000 000000 0000	000000 00							000000 000000 0000	000000 000000 0000	0000 0000	0000 0000
Marrige	000000 000000 0000	00	0000	0000				0000		0000	000000 000000 0000	
Went of Cash & Credit Net & Boat	0000 0000	0000 0000				000000 000000	000000 000000	000000 000000	000000 000000	000000 000000 0000	000000 000000 0000	
Financial crisis	000000 000000	000000 000000							0000 0000			000000 000000
Income	0000	0000	000000 000000 0000	000000 000000 0000	000000 000000 0000	000000 000000 0000	000000 000000 0000	000000 00	000 000	0000 0000	0000 0000	0000
Religious Festival		000000 000000 0000					000000 000000	000000 000000 0000	000000			
Education Expense Children									000000 000000 0000	000000 000000 0000		

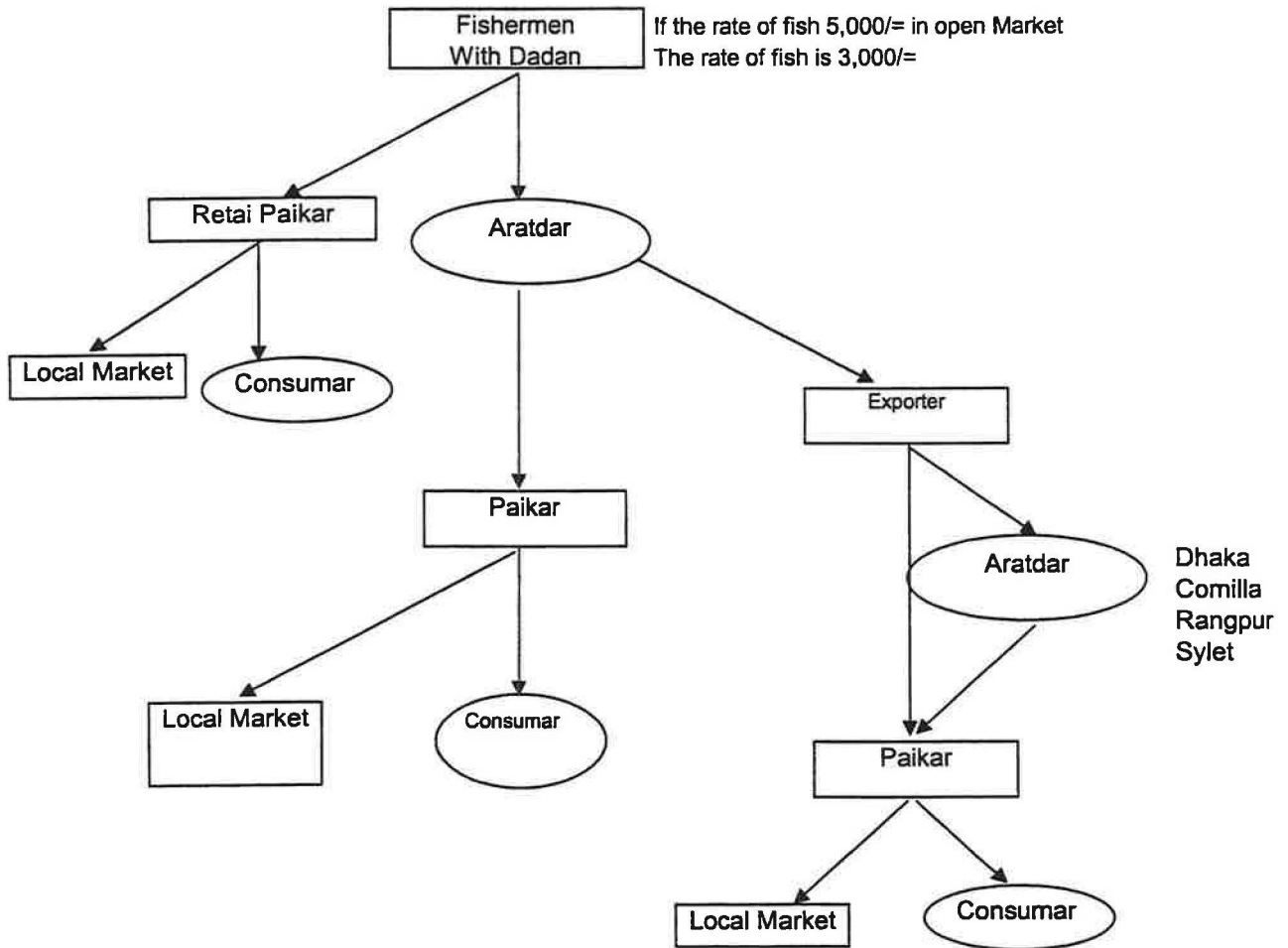
Commodity Chain of Fresh Fish Chittagong

Commodity Chain of Hilsh Fish
(Mid June To September)



Commodity Chain of Fresh Fish

Commodity Chain of Hilsh Fish
(Mid June To September)



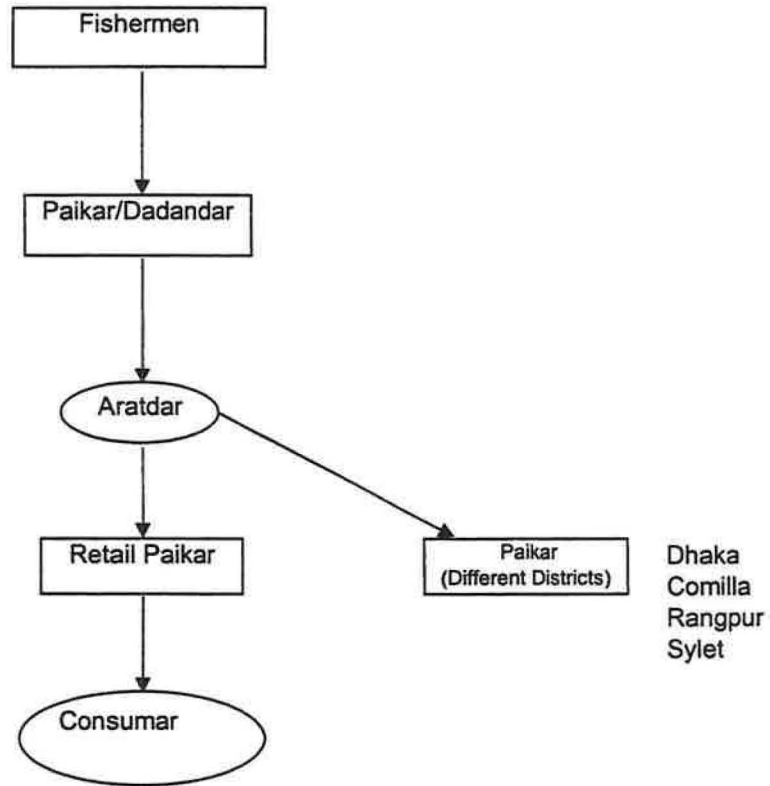
Commodity Chain of Fresh Fish Chittagong

Commodity Chain of All spices



Commodity Chain of Fresh Fish

Commodity Chain of Hilsha Fish
(Mid June To September)

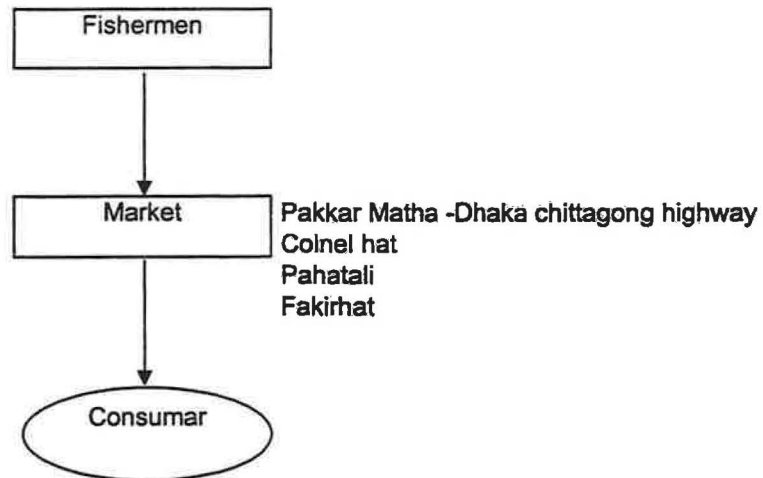


Prepared by:

- 1 Mojammel Hoque
- 2 Suresh
- 3 Himangsu
- 4 Manindra
- 5 Ali ajar
- 6 Amrita
- 7 Ajam

Commodity Chain of Fresh Fish

Commodity Chain of Small fish, Chittagong
(Mid October to Mid May)

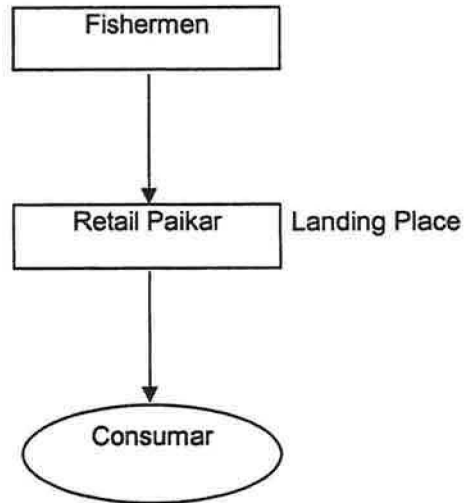


Prepared by:

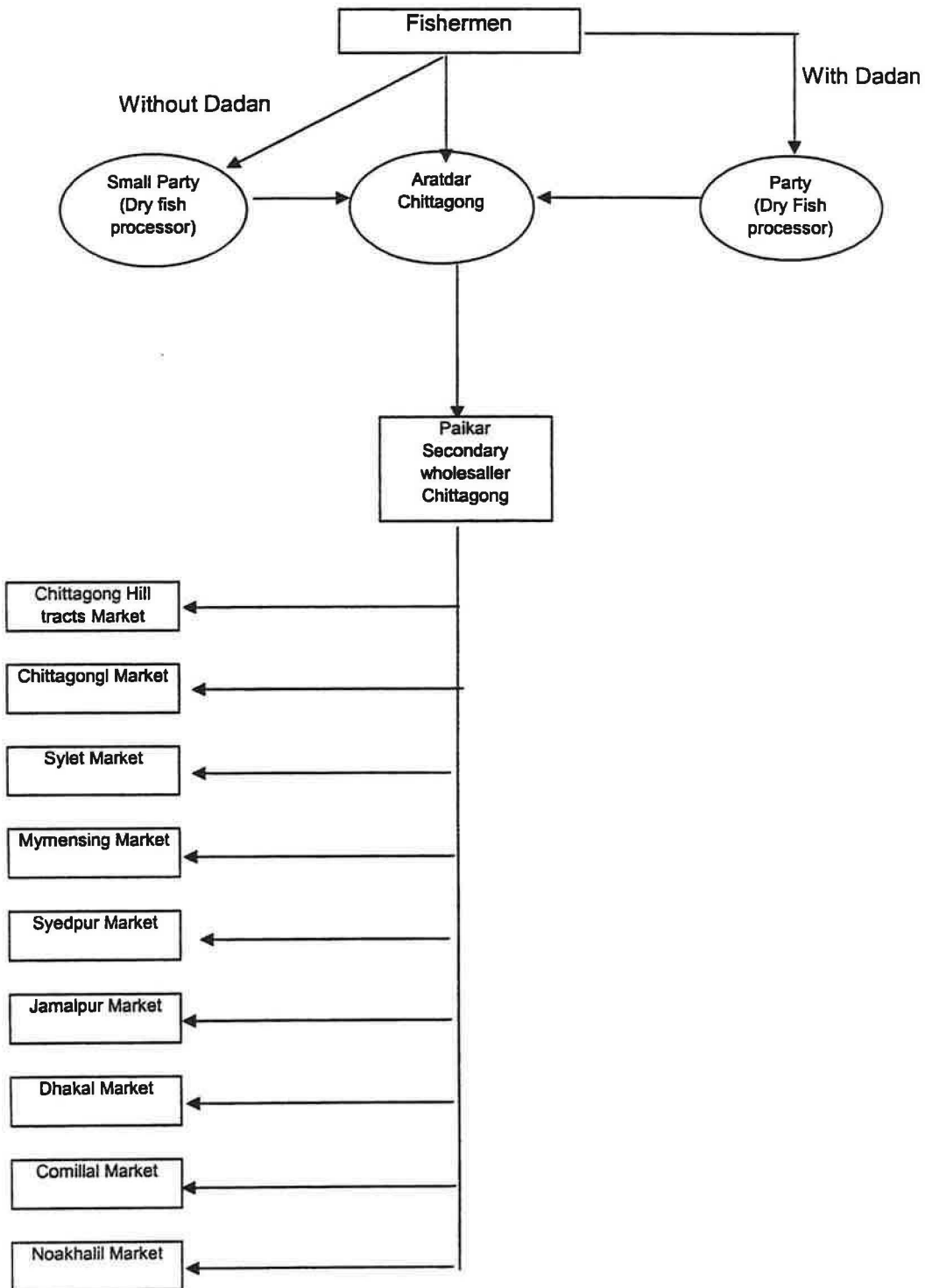
- 1 Mojammel Hoque
- 2 Suresh
- 3 Himangsu
- 4 Manindra
- 5 Ali ajgar
- 6 Amrita
- 7 Ajam

Commodity Chain of Fresh Fish Chittagong

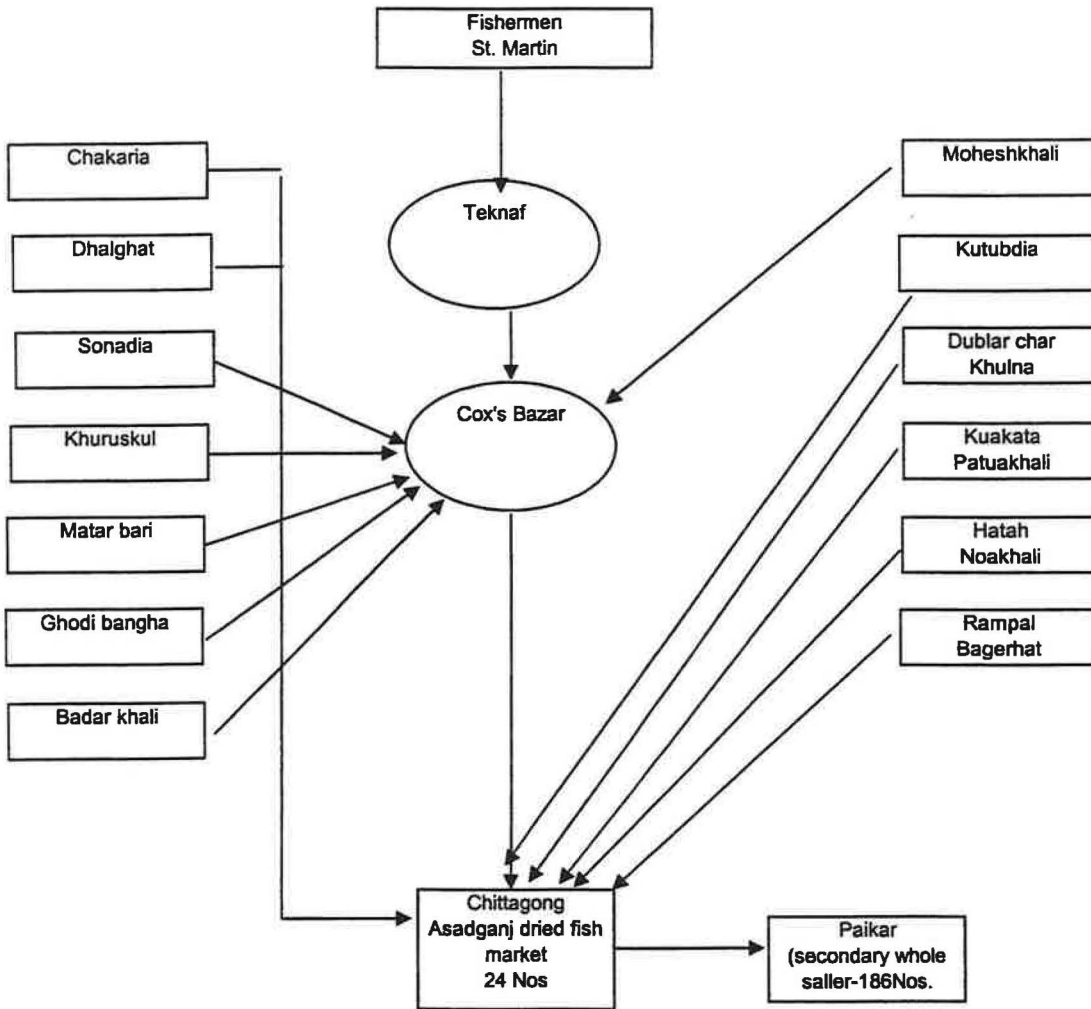
Commodity Chain of Small fish
(Mid October to Mid May)



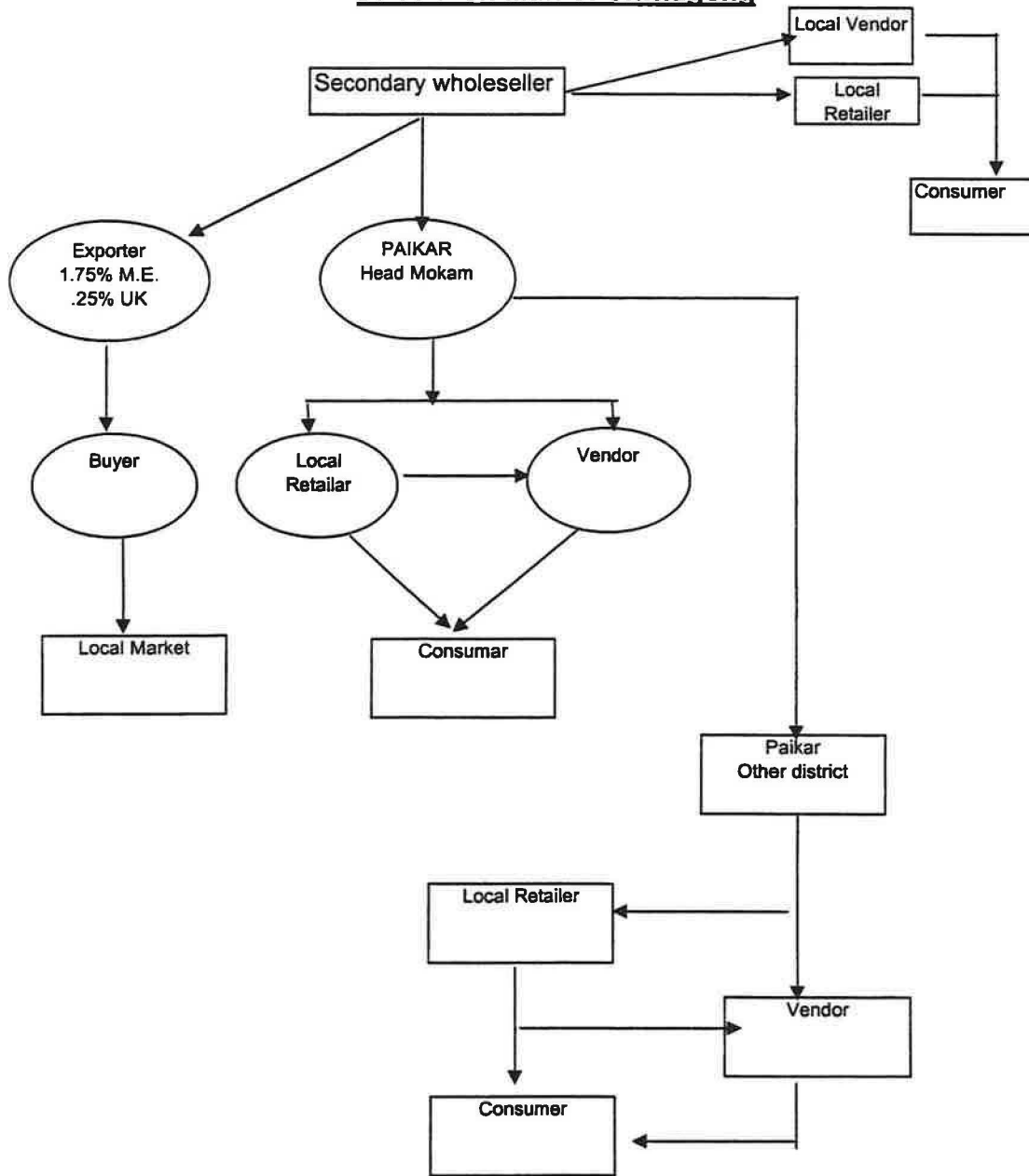
Dried Fish Market Chittagong



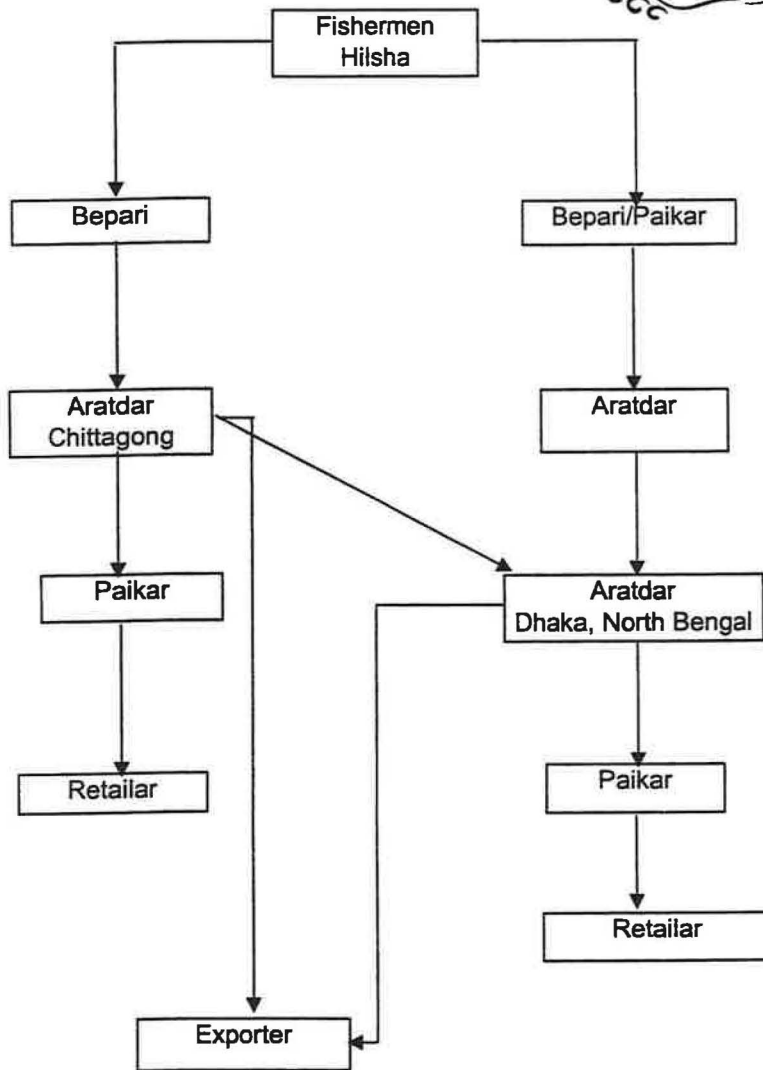
Dried Fish Market Chittagong



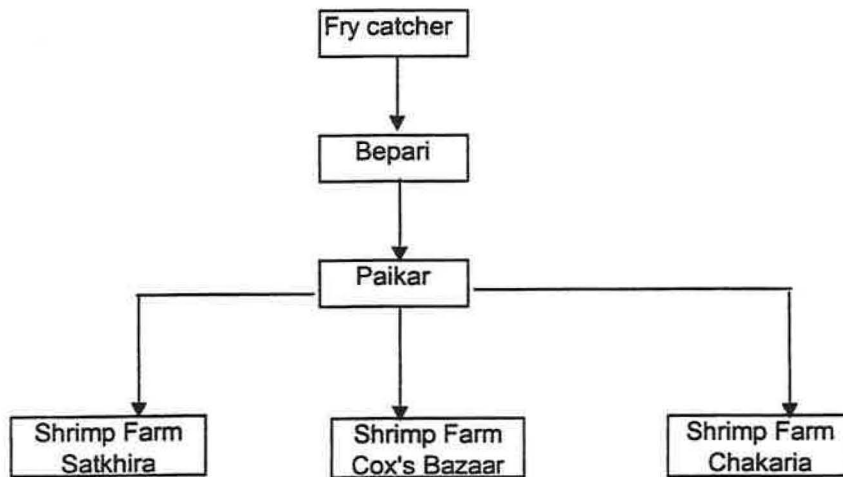
Dried Fish Market Chittagong



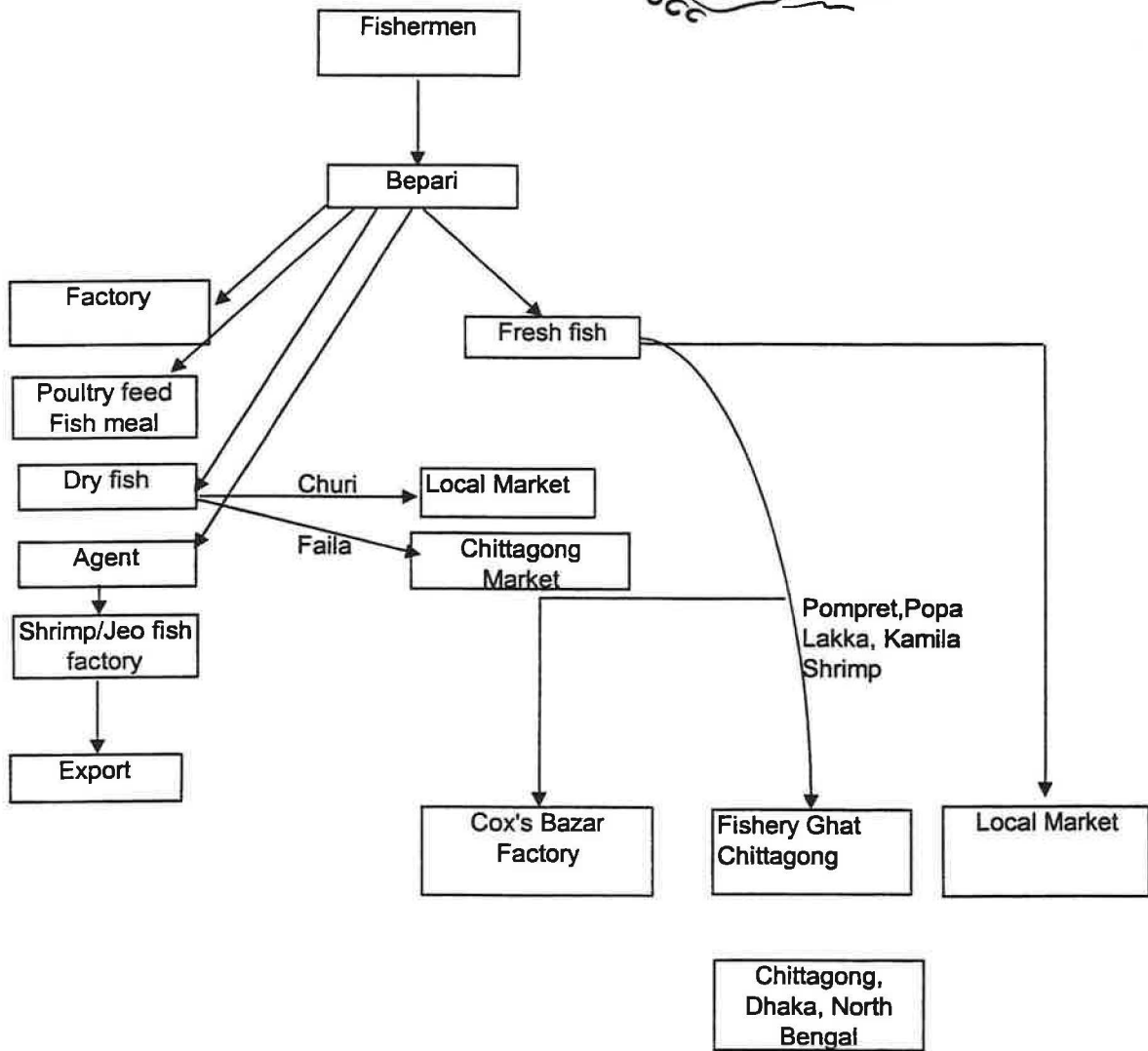
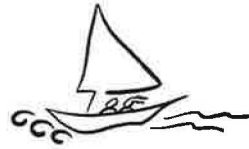
Commodity Chain Frsh fish
Hatkholapara, Khuruskul
Cox's Bazaar



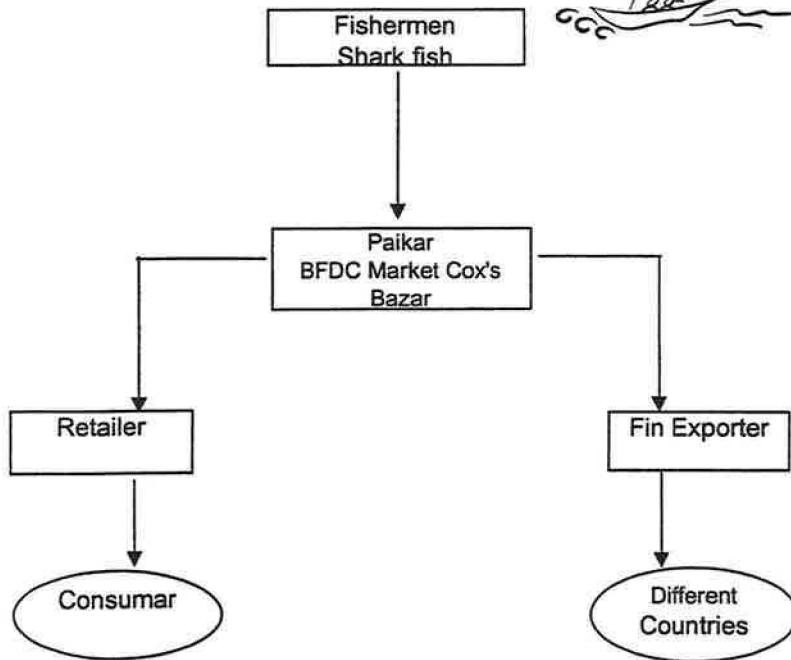
Commodity Chain Frsh fish
Hatkhola para, Khuruskul
Cox's Bazaar



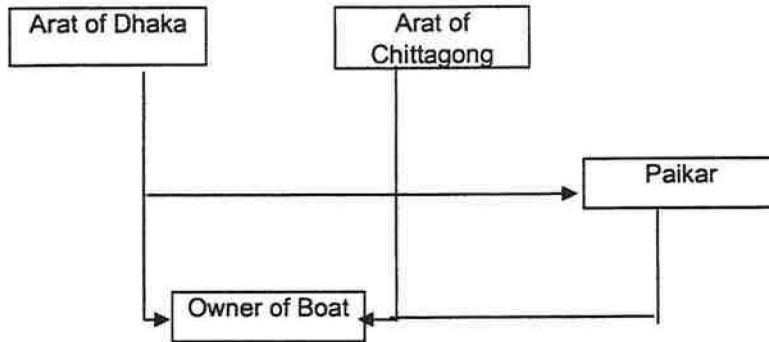
Commodity Chain Frsh fish
 Hatkholapara, Khuruskul
Cox's Bazaar



Commodity Chain Frsh fish
Hatkhola para, Khuruskul
Cox's Bazaar

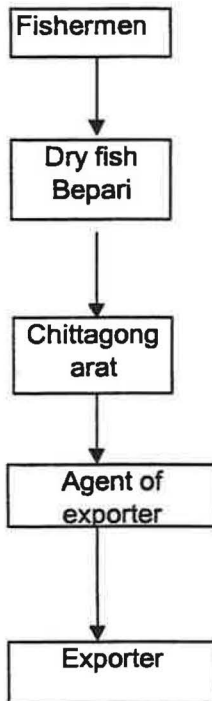


Commodity Chain Frsh fish
Hatkholapara, Khuruskul
Dadan Flow Cox's Bazaar



Commodity Chain Frsh fish
Hatkhola para, Khuruskul
Cox's Bazaar

Chapta Hangor fish

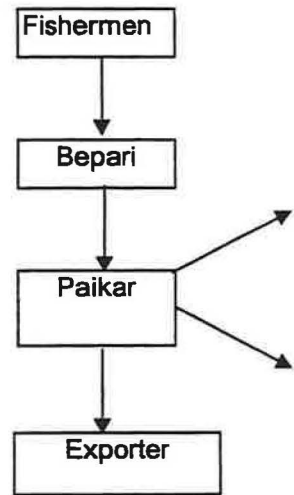


Japan, Thailand
Hongkong etc.

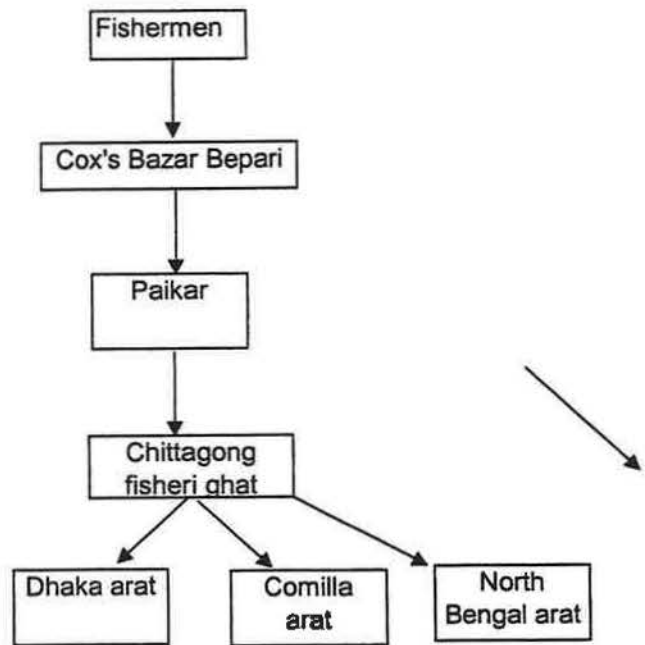
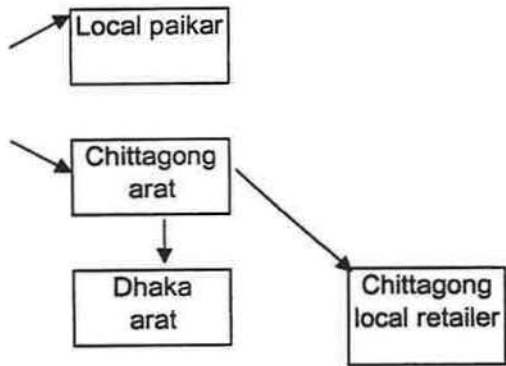
Kata Mach



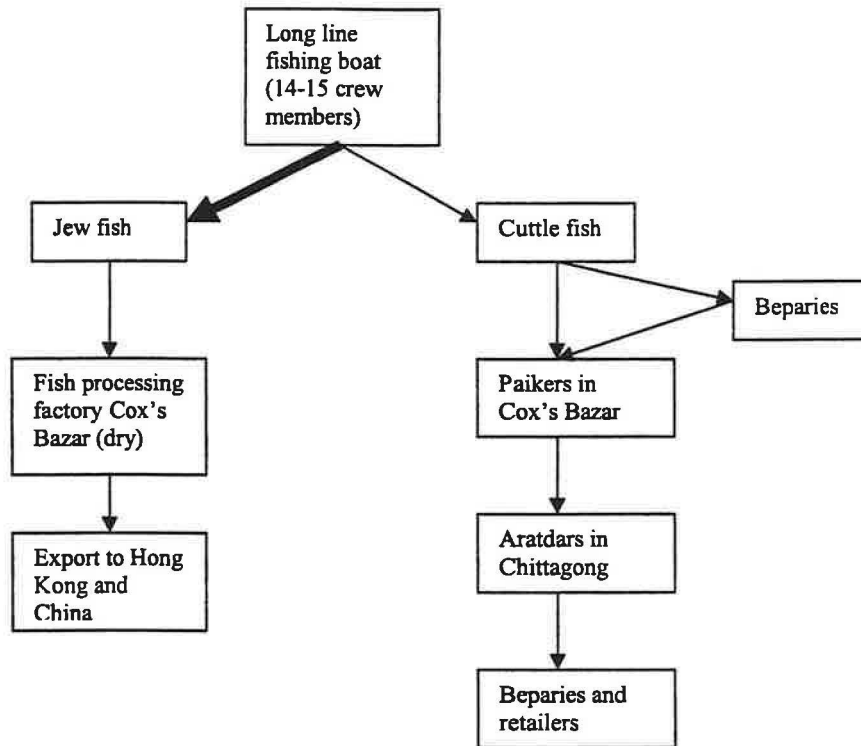
Pompret/Faila



Current Jal



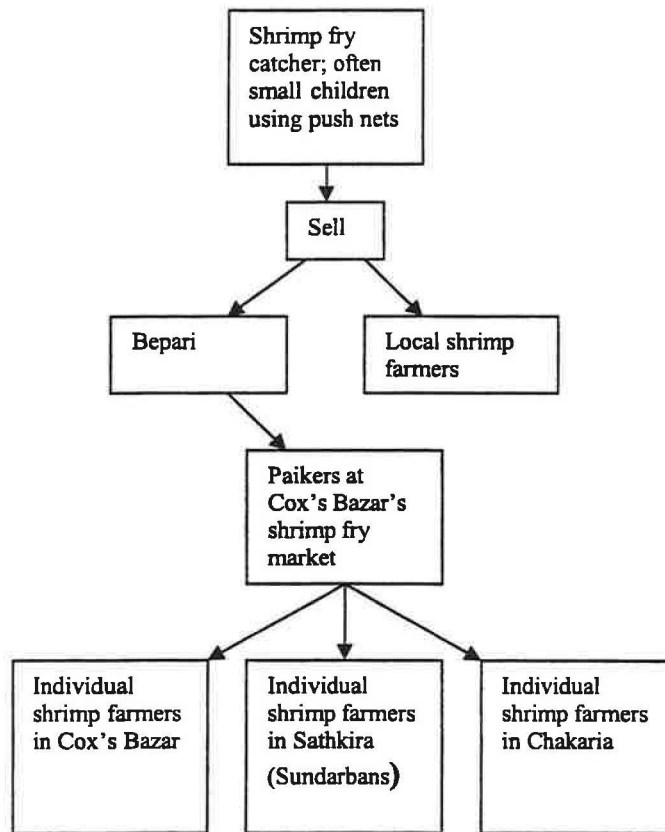
Box x: Commodity chain, Longline fishery, Hatkholapara, Khuruskhul



Notes: Other fish species such as flat sharks (Chefta hangar), 'round leaf' fishes (Golpata masch) and 'long tail' fish (Huasch fish) are sold fresh to individual fish processors. The skin is processed and sold to exporters for the market in Japan and Thailand. The skin is used for wallet and bag manufacturing. The meat is mainly consumed by migrants from Myanmar and Bengal, which is sold at the fresh fish market in Cox's Bazar. Very little is dried for the dry fish market. The cuttle fish maw is dried for both the local market and the export market.

Commodity chain Hatkholapara, Khuruskul, Cox's Bazaar

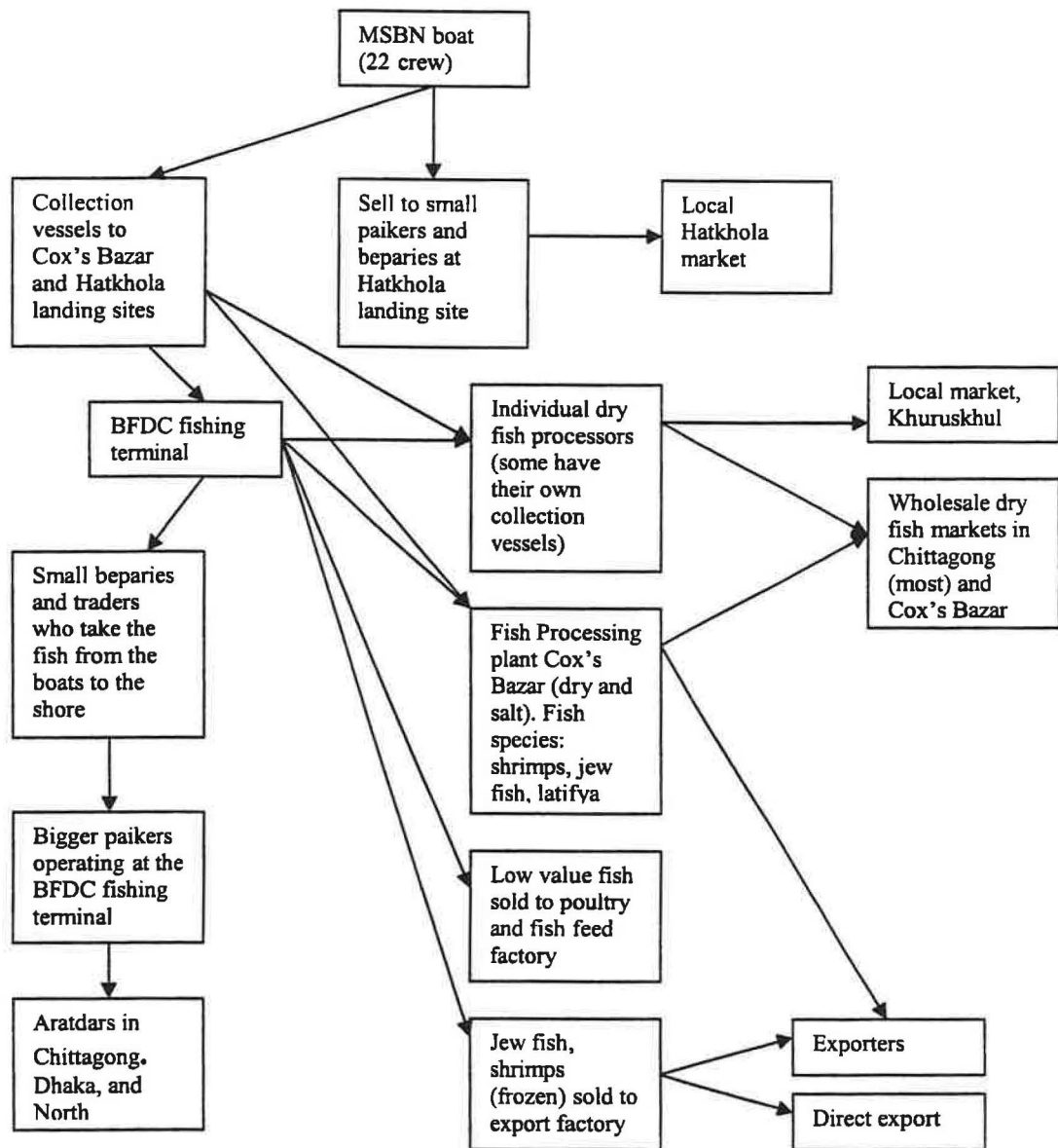
Shrimps



Additional notes:

Beparies provide dadan to the collectors. Beparies get a loan from the paikars, who again get a loan from the shrimp farmers

Box x: Commodity chain Marine Set Bag Nets fisheries, Hatkhola, Khuruskhul



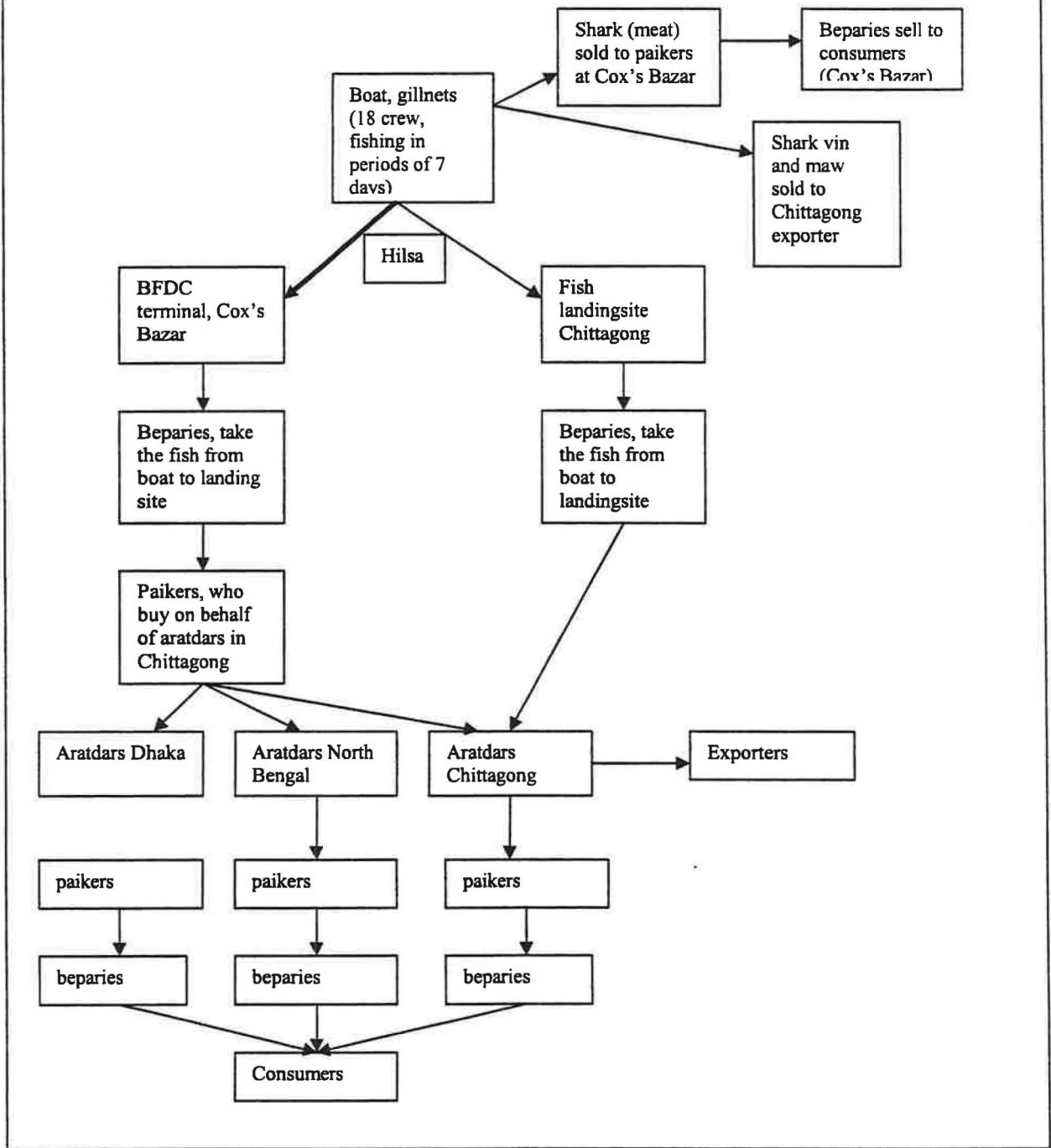
Notes:

Dadan

The aratdar for dry fish provides loans to MSBN owners and to dry fish processors and buys the dry fish supply against 10% below the market price. Some MSBN boat owners are directly involved in drying fish.

Fresh fish aratdars provide loans to MSBN boat owners and collection vessels owners and buys fresh fish from them directly against 10% below the current market price.

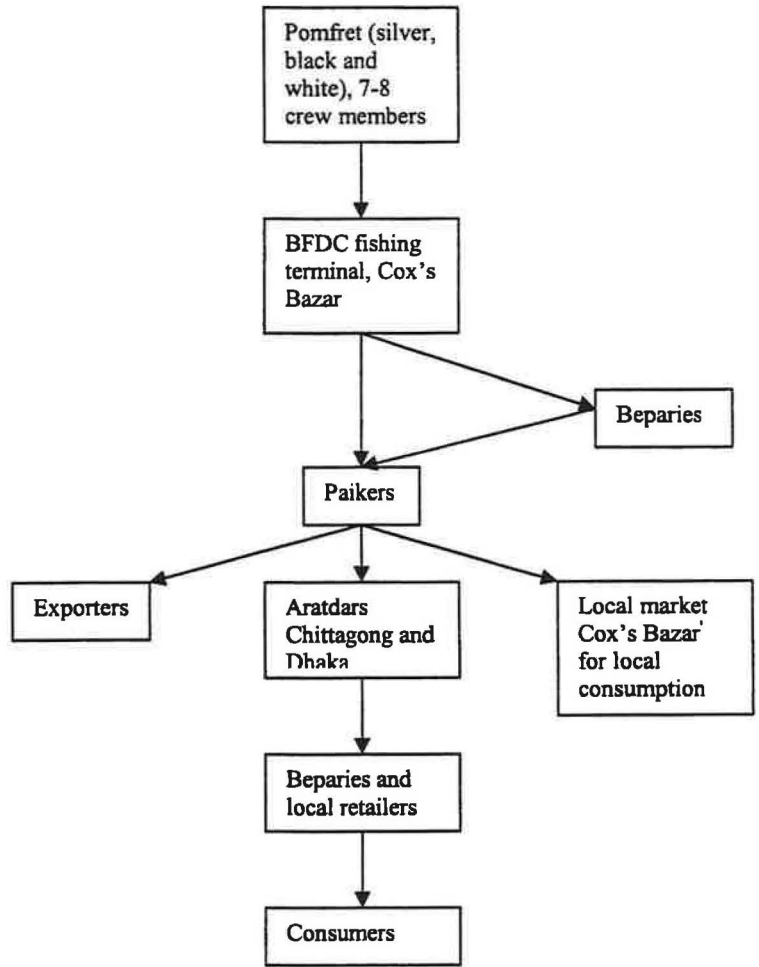
Box x: Commodity chain, Hilsa fisheries, Hatkholapara, Khuruskhul



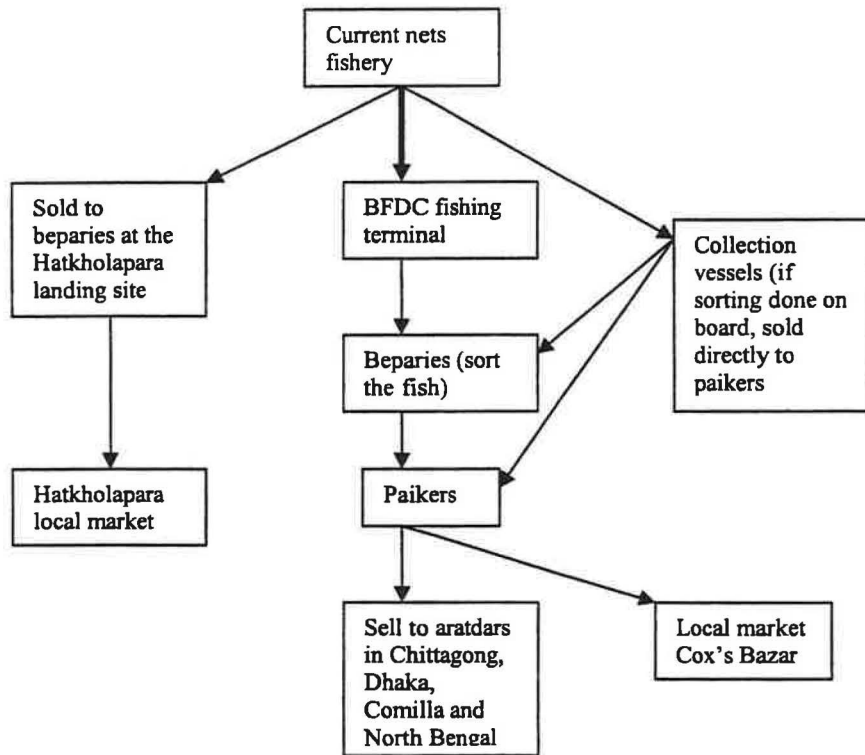
Note:

Aratdars in Dhaka and Chittagong provide loans to paikers who again provide loans to hilsa fishers, against 10-20% of the marketprice.

Box x: Commodity chain Pomfret, Hatkholapara, Khuruskhul



Box x: Commodity chain current nets, Hatkholapara, Khuruskhul



:

**Commodity Chain
Hilsha fish
Choto Gadi
Kuakata**



Small Fishermen

Hokar

Choto Gadi
Kuakata

Big Boat



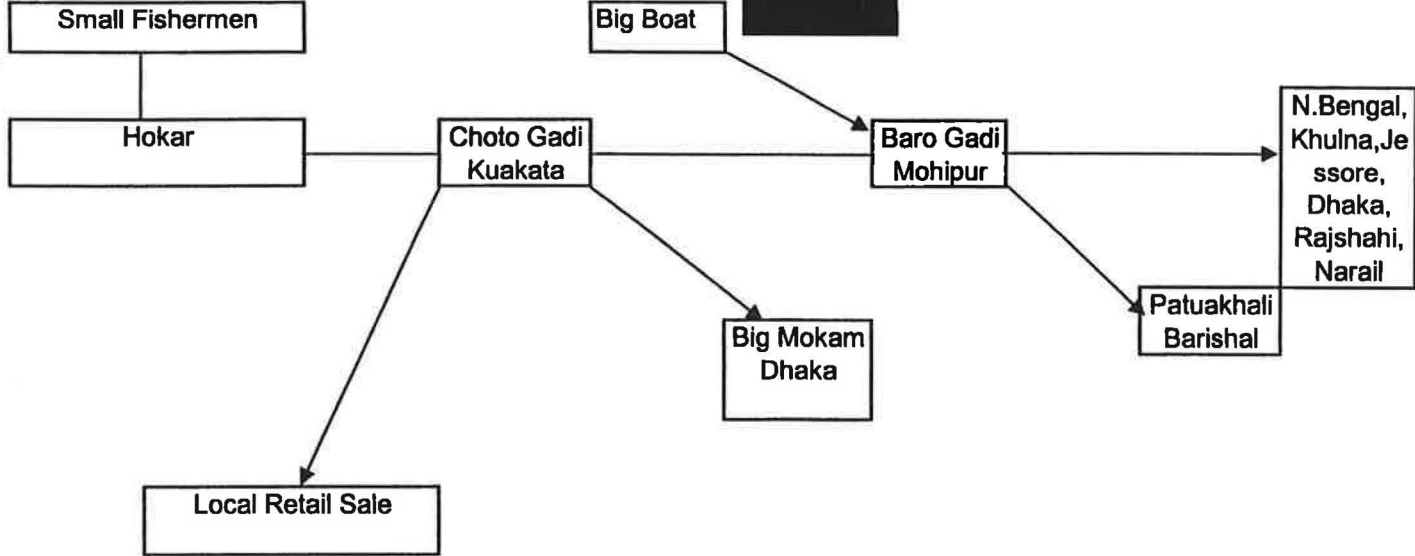
Baro Gadi
Mohipur

Big Mokam
Dhaka

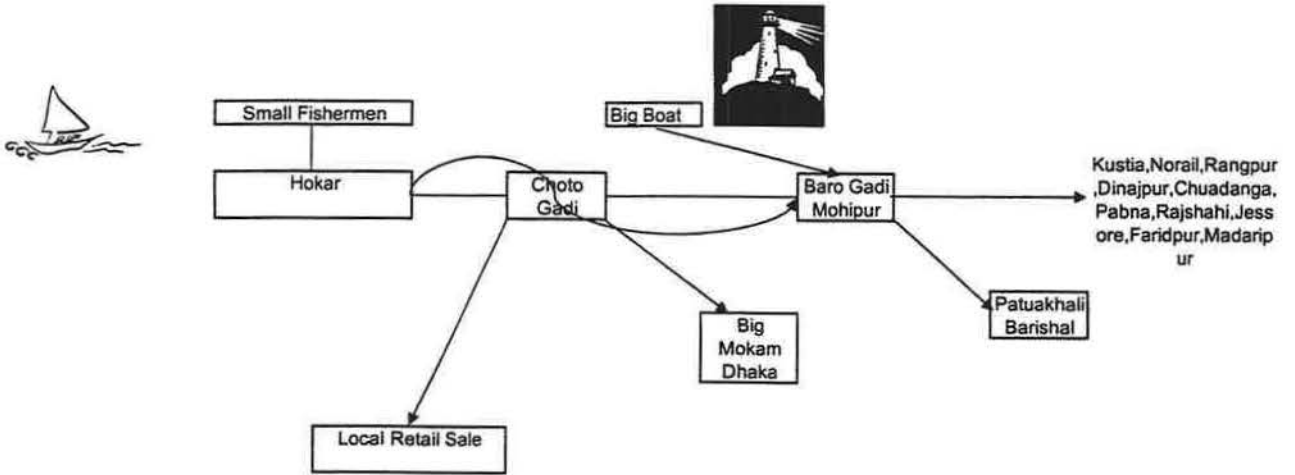
Patuakhali
Barishal

N. Bengal,
Khulna, Je
ssore,
Dhaka,
Rajshahi,
Narail

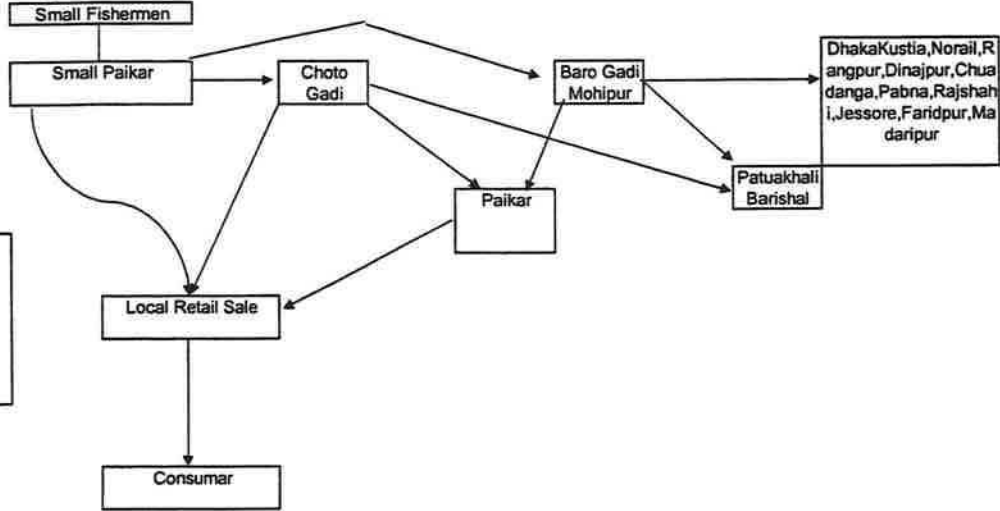
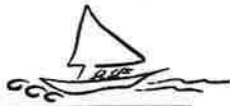
Local Retail Sale



Commodity Chain
Alipur arat
Kuakata

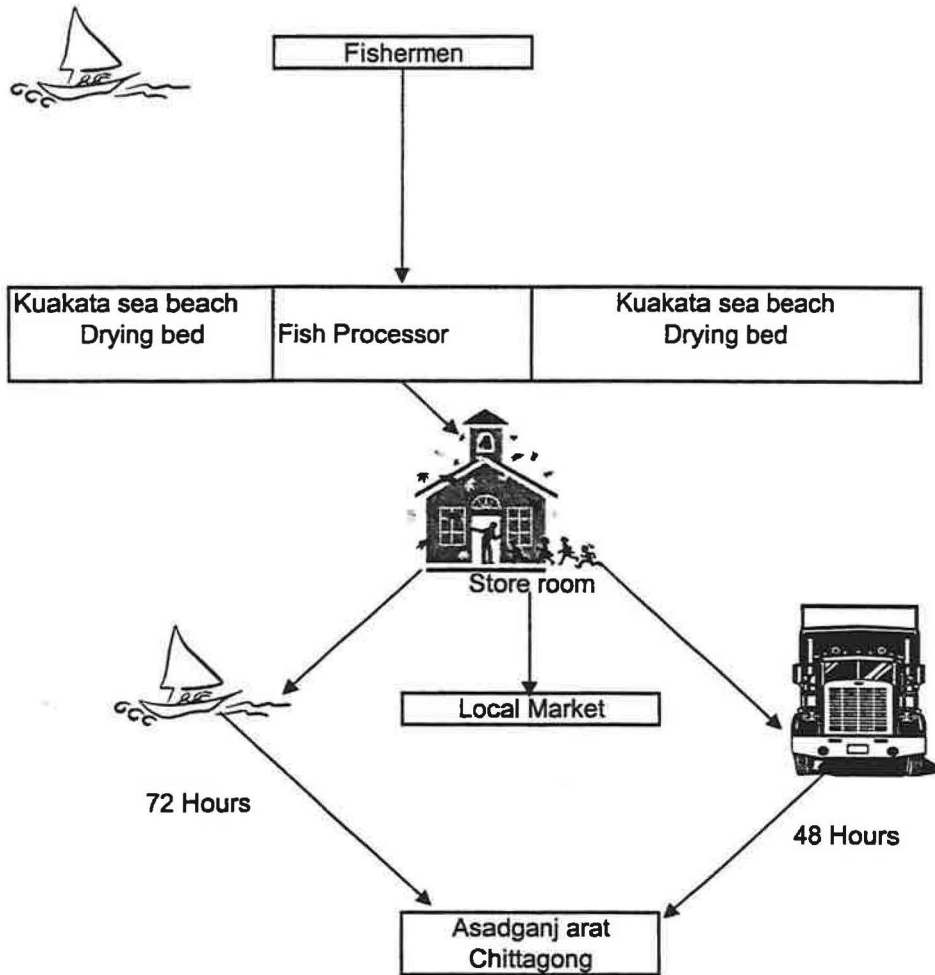


Commodity Chain
Choto gadi
Kuakata
Different species

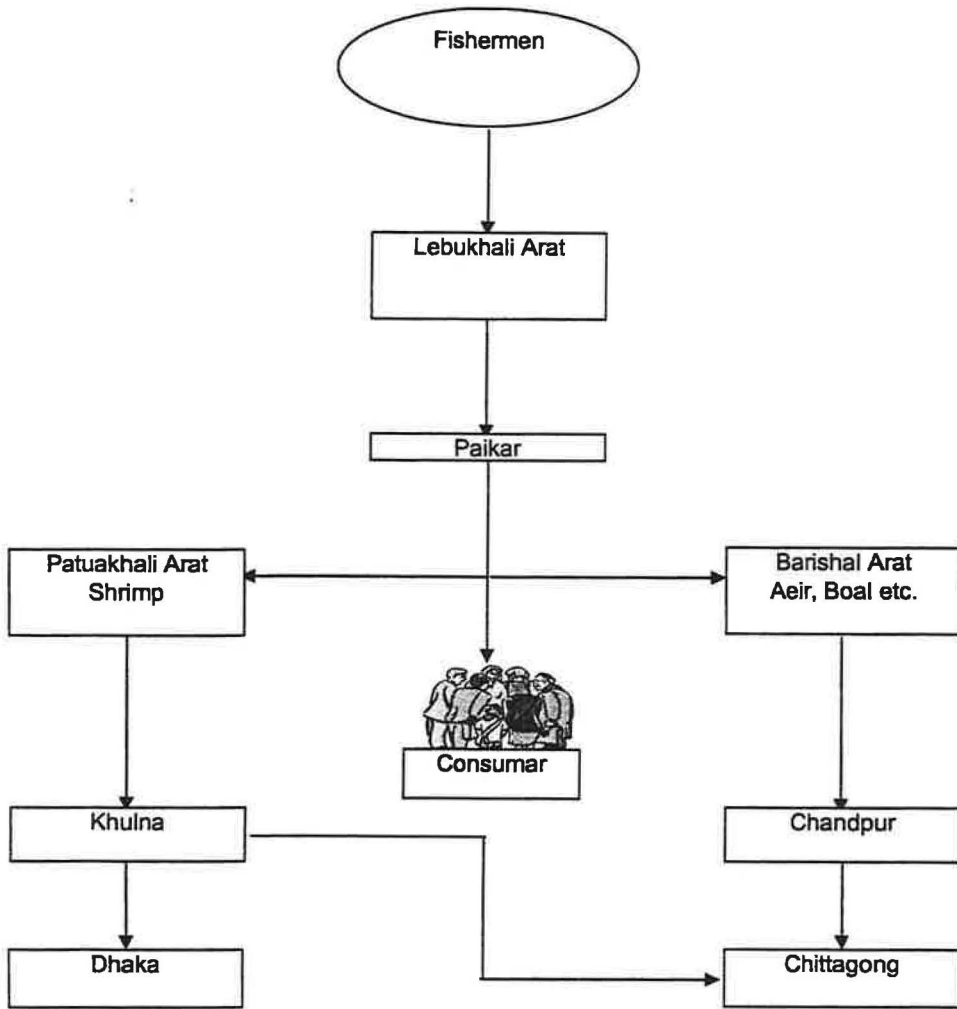


Name of the species:
Juvenile hisha,
Joe fish
Medh
Mochon, Air, Shrimp,
Pomfret, Bombay duck,
Pangash, Taila etc.

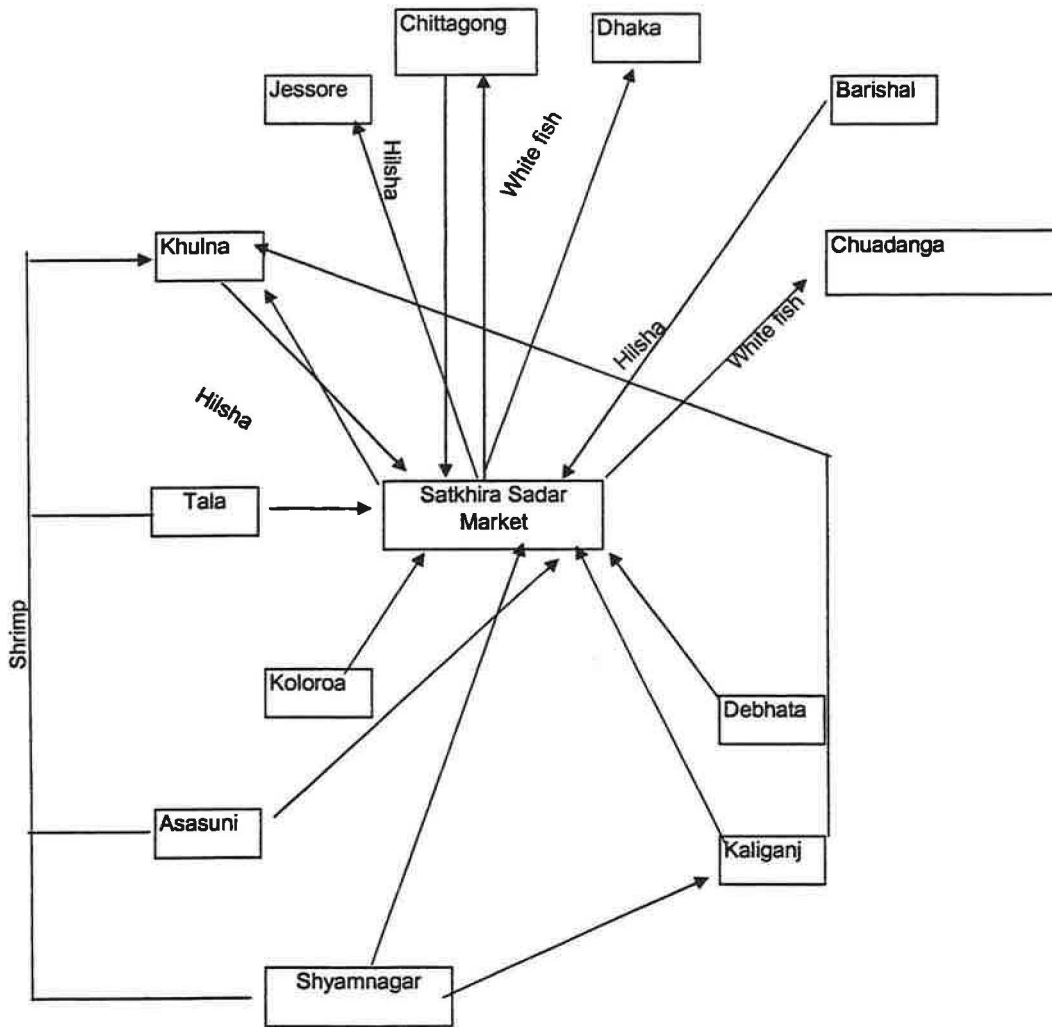
**Commodity Chain
Dry Fish
Panjupara, Kuakata**



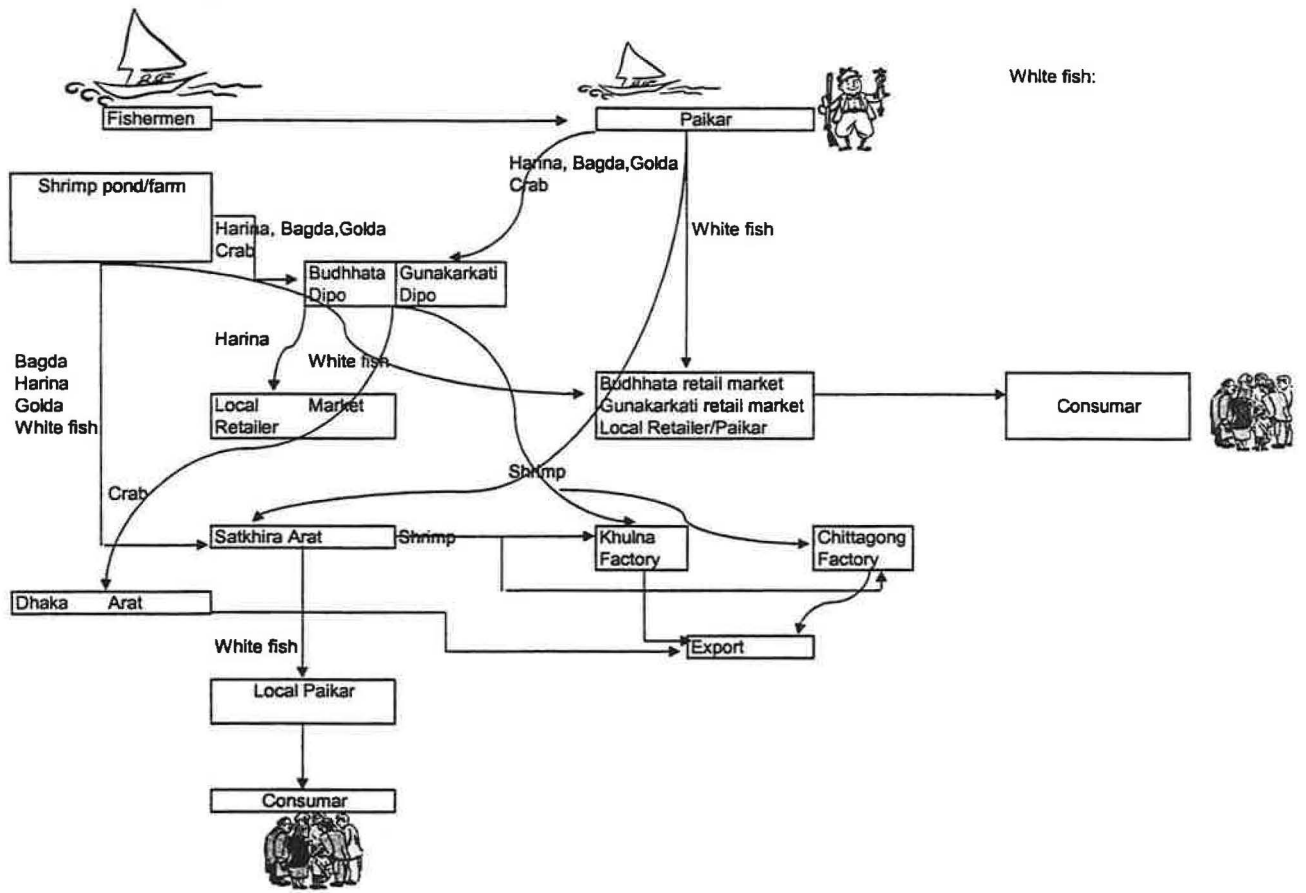
Commodity Chain
Lebu Khali
Patuakhali



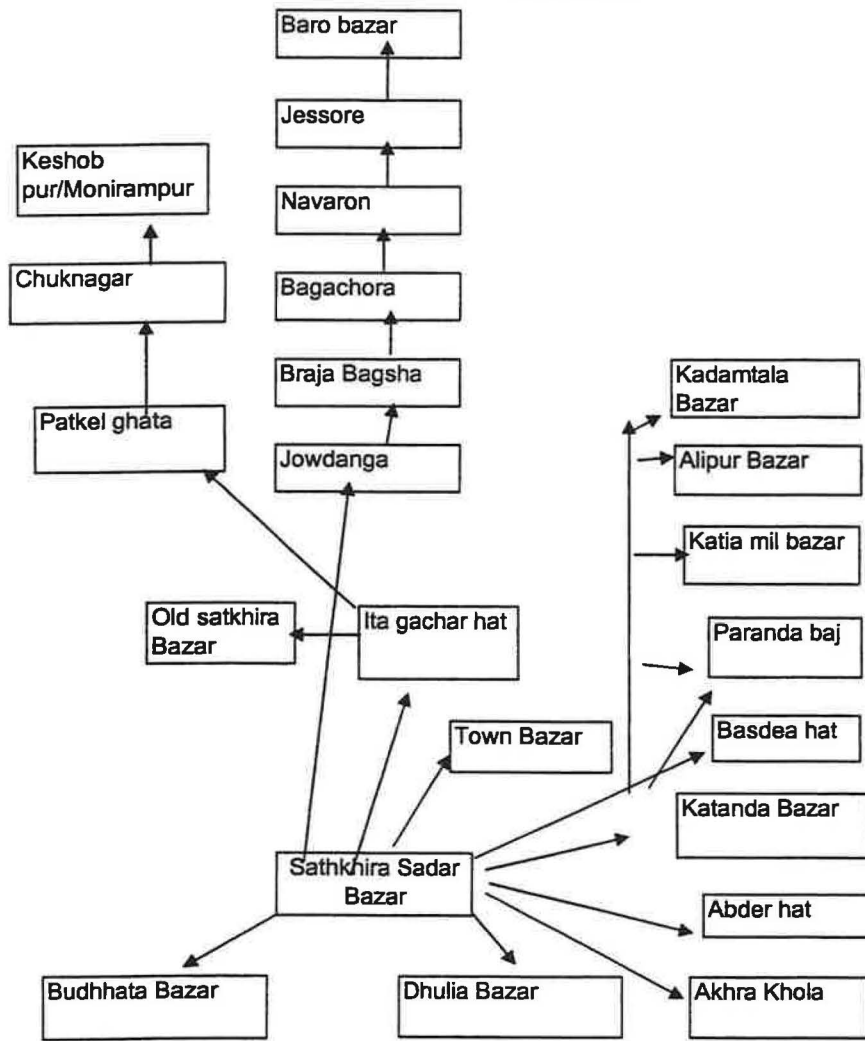
Commodity Chain Satkhira



**Commodity Chain
Kulla, Satkhira**



Commodity Chain Satkhira



Prices for Fresh and Dried Fish

Place: Chittagong Wholesale Markets (Fisheries Ghat and Asadgonj)

Taka per kg

	Jul-01	Aug-01	Sep-01	Oct-01	Nov-01	Dec-01	Jan-02	Feb-02	Mar-02	Apr-02	May-02	Jun-02
Fresh Fish												
Hilsha	155	181	55	60	65	60	65	65	57	60		
Pomfret	267	261	125	135	135	140	150	160	150	160		
Bombay duck	27	29	18	20	15	10	12	15	10	20		
Shrimp	800	693	340	350	260	330	360	360	350	340		
Tilapia	61	59	50	55	45	50	55	50	45	50		
Rui, local	112	109	87	90	85	110	115	140	130	125		
Rui from India	75	96	45	50	55	55	60	60	57	60		
Rui from Myanmar	64	67	40	45	50	50	55	62	58	58		
Dried Fish												
Ribbon fish (Chhuri)	160	155	155	163	157	160	150	170	175	155		
Faishya (anchovi)	133	136	131	136	112	109	105	90	110	100		
Salted Hilsha	192	149	187	189	184	179	179	189	195	200		
Shrimp, red	173	171	171	171	163	160	200	150	180	180		

NB: Prices were collected by CODEC staff during the last week of the month.

Prices were average prices per kilogramme for average quality fish.

For Asad Gunj, the prices were collected at secondary wholesale market level (i.e. from a selection of the 186 traders)

Prices for Fresh and Dried Fish

Place: Chittagong, Bahaddarhat Bazaar (retailer to consumer)

Taka per kg

	Jul-01	Aug-01	Sep-01	Oct-01	Nov-01	Dec-01	Jan-02	Feb-02	Mar-02	Apr-02	May-02	Jun-02
Fresh Fish												
Hilsha	120	100	150	80	150	150	140	120	120	180		
Pomfret	200	180	260	130	250	300	250	250	150	120		
Bombay duck	40	35	40	20	50	40	35	40	40	30		
Shrimp	80	70	60	50	90	85	80	50	40	50		
Tilapia	70	50	70	60	90	70	45	60	50	60		
Rui, local	110	110	120	110	150	120	140	130	120	130		
Rui from India	60	60	60	60	60	60	36	36	60	55		
Rui from Myanmar	80	70	60	75	75	60	40	40	70	65		
Dried Fish												
Ribbon fish (Chhuri)	210	200	140	150	140	140		120	120	140		
Faishya (anchovi)	180	190	200	200	210	225	150	90	80	120		
Salted Hilsha	200	200	200	290	290	300	600	800	250	260		
Shrimp, red	210	210	220	220	230	210	240	170	200	210		

NB: Prices were collected by CODEC staff during the last week of the month.
Prices were average prices per kilogramme for average quality fish.

Prices for Fresh and Dried Fish

Place: Kumira (fish sold by fishermen to paikers, without dadan arrangements)

Taka per kg

	Jul-01	Aug-01	Sep-01	Oct-01	Nov-01	Dec-01	Jan-02	Feb-02	Mar-02	Apr-02	May-02	Jun-02
Fresh Fish												
Hilsha	60	40	40	40	60			80				
Pomfret	65	60	60	62	70	80	80	80	85			
Bombay duck	20	15	15	15	20	25	25	25	25			
Shrimp				20	20	25	25	20	30			
Tilapia								70	70			
Rui, local								80	80			
Rui from India								70	70			
Rui from Myanmar												
Dried Fish												
Ribbon fish (Chhuri)												
Faishya (anchovi)	120	130	130	130	130	130	130					
Salted Hilsha	24	24	24	24	25	30	30					
Shrimp, red	280	280	280	260	260	250	250					

NB: Prices were collected by CODEC staff during the last week of the month.
Prices were average prices per kilogramme for average quality fish.

Prices for Fresh and Dried Fish

Place: Patuakhali Wholesale Market (fish sold by paikers to other traders)

Taka per kg

	Jul-01	Aug-01	Sep-01	Oct-01	Nov-01	Dec-01	Jan-02	Feb-02	Mar-02	Apr-02	May-02	Jun-02
Fresh Fish												
Hilsha	80	80	90	90	120	140	150	150	145			
Pomfret					80	90	100	105	110			
Bombay duck							80	85	80			
Shrimp	500	500	500	500	400	500	500	850	800			
Tilapia	90	90	95	95	50	60	80	65	60			
Rui, local	120	110	130	130	100	120	120	100	105			
Rui from India												
Rui from Myanmar												
Dried Fish												
Ribbon fish (Chhuri)												
Salted Hilsha												
Faishya (anchovi)												
Shrimp, red												

NB: Prices were collected by CODEC staff during the last week of the month.

Prices were average prices per kilogramme for average quality fish.

Prices for Fresh and Dried Fish

Place: Mohipur (fish sold by fishermen to traders, without dadan arrangement)

Taka per kg

	Jul-01	Aug-01	Sep-01	Oct-01	Nov-01	Dec-01	Jan-02	Feb-02	Mar-02	Apr-02	May-02	Jun-02
Fresh Fish												
Hilsha	99	115	94	95	90	85	105	100	110	105		
Pomfret	105	100	100	95	90	95	148	155	160	150		
Bombay duck	75	80	80	70	75	70	80	85	80	82		
Shrimp	330	320	310	326	300	346	86 small	85 small	88 small	80 small		
Tilapia												
Rui, local												
Rui from India												
Rui from Myanmar												
Dried Fish												
Ribbon fish (Chhuri)	60	65	68	70	65	66	68	70	70	72		
Salted Hilsha	80	85	75	80	75	65						
Faishya (anchovi)	50	52	55	60	62	65						
Shrimp, red	55	50	53	50	52	55	45	48	48	50		

NB: Prices were collected by CODEC staff during the last week of the month.

Prices were average prices per kilogramme for average quality fish.

Appendix 2: Overview of the Sustainable Livelihoods Approach

Appendix 2

Summary of “The Sustainable Livelihoods Approach and its Relevance for Fish Marketing”, based on Oudwater (2001)

The ultimate goal of Sustainable Livelihoods is to maintain an income, to minimise social exclusion, achieve social equity and a long term productivity of natural resources without undermining livelihoods or compromising livelihood options open to others. The focus of the development debate moved beyond the state of resources and began to include people, livelihoods and poverty alleviation as highlighted in DFID’s Sustainable Livelihoods Approach.

In the White Paper on International Development 1997, DFID outlined its commitment to poverty reduction through policies and actions which:

- Promote Sustainable Livelihoods
- Education, health and opportunities for the poor
- Protection and better management of the natural and physical environment

Box 1: The three dimensions of Sustainable Livelihoods

In sum, there are three dimensions to Sustainable Livelihoods (SL):

- an objective supporting the goal of poverty elimination
- a framework for thinking about poverty
- an approach for addressing poverty (the most important dimension)

SL is NOT:

- A panacea for poverty eradication
- A blueprint to guide implementation of programmes or projects targeting poverty.

From this policy objective of elimination of poverty, DFID has worked towards developing a conceptual and operational framework that constitutes the Sustainable Livelihoods approach. Promoting the Sustainable Livelihoods approach within current development thinking is seen as a means to address the ultimate target of poverty elimination. Many NGOs like Oxfam and Care have contributed to the development of the SL approach by taking it up at an early stage and providing critical feed back and suggestions based on their ideas and ‘field’ experiences.

Definition and Principles underlying the Sustainable Livelihoods approach

A livelihood comprises the capabilities, assets and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base (Carney, 1998).

In this context, poverty focused development activities should be:

People centred – the emphasis is on people, not on resources per se. It mainly focuses on people and livelihoods at the micro community level (e.g. coastal fishing communities) and at higher policy and planning levels (e.g. local government and central government).

Holistic – it is important to look at all the different resources, opportunities and constraints that people face in pursuing and improving their livelihood strategies.

Dynamic – It is important to recognise that livelihoods are changing in response to external shocks and trends, and it is necessary to understand these changes, how the people themselves perceive these changes and how they have adapted their livelihood strategies in response to these changes.

Building on strengths – the approach starts with an analysis of strengths and resources rather than a list of needs.

Linking macro-micro levels – Bridges gaps and makes explicit links, e.g. effects of national policies on local communities.

Conducted in partnership – with donors, local organisations like NGOs and government.

Sustainable – People should be able to deal with and respond to external shocks, hardships and trends, and not being (entirely) dependent on outside support. There are four different dimensions of sustainability that are interrelated:

- a) economic - e.g. supply and demand for fish
- b) institutional – e.g. a well functioning fish marketing chain, availability of credit and loan facilities
- c) social – e.g. support from within the family and the community in general
- d) environmental - e.g. fish stocks

Box 2: Summary of Sustainable Livelihoods approach's principles

What the approach emphasises:

- A people centred participatory and responsive approach to development
- Starting with positives (what people have) and opportunities (what they can make of it)
- Build on existing development approaches
- Micro to macro policy influencing

What the approach does not emphasise:

- Starting with sectors or commodities
- Starting with needs and problems
- Replacement of existing development approaches (but sets them in broader context)
- A focus only on local development

The Sustainable Livelihoods Framework

The Sustainable Livelihoods approach is a way to understand the needs of the poor and identify key opportunities that will ultimately benefit the poor. In order to understand and analyse the lives of the poor, a Sustainable Livelihoods framework has been developed. It is important to note that it is not an ultimate blueprint. Its elements can be presented and applied in different ways (see Appendix).

SL embraces a wider approach to people's livelihoods by looking beyond income generation activities in which people engage. Through participatory approaches, it seeks to encourage various stakeholders, with their own perspectives, to engage in these discussions and debate about factors affecting their livelihoods.

Box 3: The key elements of the Sustainable Livelihoods framework

The key elements of the SL framework are:

- *Capital assets*: resources that help people survive and thrive (i.e. natural, social, human, physical and financial capital)
- *Vulnerability context*: things that the poor are vulnerable to
- *Policies, institutions and processes*: influence their livelihoods
- *Livelihood strategies*: how do people adapt and plan in response to threats and opportunities
- *Livelihood outcomes and aspirations*: what are people's objectives and priorities?

Capital assets

Capital assets are resources that help people survive and thrive. The main capital assets are natural, human, social, physical and financial capital (e.g. fishing skills, aquatic resources, social relations, access to credit, infrastructure, etc). Assets are important in terms of quantity and quality. In addition, the question is how do men and women access assets and what is the extent of their control, rights and security of access. Although it is not possible to define a 'minimum' level of assets needed for survival, as the categories are highly subjective and location specific, it is obvious that the better people's overall asset status is, the better they will be able to respond to changes and face hardships. A pentagon is sometimes used as a visual tool to present information about people's access to assets and the interrelationships.

Vulnerability

Next to an understanding of people's strengths and access to assets, it is important to understand the vulnerability context in which these assets exist. What are the external factors that influence the levels of assets and how these assets can be used? These

external factors are often related to causes of poverty, which makes poor people, in particular, vulnerable. For many poor rural people, changes in natural capital can particularly affect their vulnerability, as they are heavily dependent on natural resources. Three major types of external factors can be recognised: trends, shocks and seasonality (e.g. declining fish stocks, price fluctuations, floods, etc).

Policies, institutions and processes

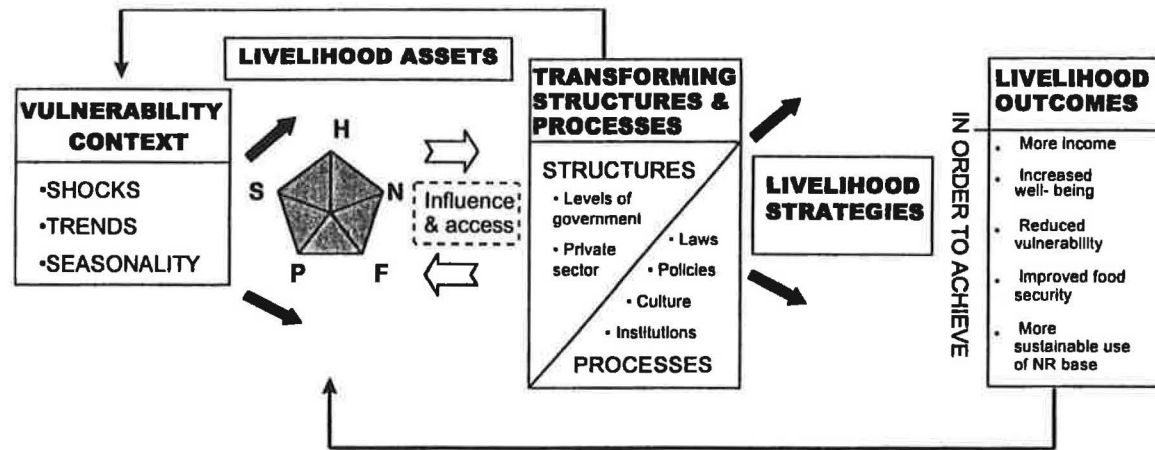
As mentioned earlier, one of the key principles of the Sustainable Livelihoods approach is the attempt to link micro and macro levels: the household/community level with processes as initiated by the government, the private sector and NGOs. There is a two way influence between assets and policies and institutions. Existence or lack of policies can have important effects on the livelihoods of the poor. Changes or transformations in these policies and institutions can be used to mitigate negative effects of trends on the overall asset status and cushion the impact of shocks and seasonality, thereby reducing people's vulnerability.

Rules of access to natural resources will influence people's access and control over natural capital. The marine fishery is considered as a common property, which means it is shared amongst those who fish it. A common problem associated with common property resources is 'the free rider' problem, as individuals benefit from use of the resources but do not bear the full opportunity costs of their use of common resources. In general, there is a tendency towards short-term gains rather than an attempt to manage the natural resources in a sustainable manner as benefits might be reaped by others who have not made any investment in such sustainable resource management efforts. Consequently, many marine fishing grounds are considered as being overexploited. Not only fishers will be negatively affected by loss of fish resources but also those involved in the marketing chain and many coastal families as they depend on fish as an important source of animal protein. Among policy makers there has been an increasing awareness for the need to devolve user rights to lower levels, such as communities, to encourage sustainable resource management.

Livelihood strategies

Livelihood strategies are the range of outcomes of how people combine and use their assets to make a living given the factors that make them vulnerable and the policy and institutional context within which they live. In the past, development efforts often sought to improve services and opportunities available to categories of people e.g. fisherfolk. However, the Sustainable Livelihoods approach seeks to develop an understanding of the factors behind people's choice of livelihood strategy and to reinforce the positive aspects and mitigate the constraints or negative influences. In sum, the Sustainable Livelihood approach seeks to identify ways how to build on the strengths the people have while at the same time trying to reduce the level of vulnerability.

Figure: A Sustainable Livelihoods Framework



Source: DFID/ ODI

Appendix 3: List of scientific, Bangla and English fish names

Appendix 3

List of Scientific, Bangla and English Names of Fish, Molluscs and Crustaceans

Scientific Names	Bangla	English
Fish		
<i>Acanthopagrus datina</i>	Datina	Sea bream
<i>Actobatus narinari</i>	Narinari	Eagle ray
<i>Actomyleus nichofii</i>	Sankachil	Eagle ray
<i>Agyrops spinifer</i>	Lal datina	Red bream
<i>Alia coila</i>	Banspala, Kanjuli	
<i>Amblypharyngodon mola</i>	Mola	
<i>Anabas testudineus</i>	Koi	
<i>Anguilla nebulosa</i>	-	Eel
<i>Anadontostoma chacunda</i>	Koi puti	Shad
<i>Aristichthys nobilis</i>	-	Bighead carp
<i>Atrapus atrapus</i>	Kanwa	Torredo trevally
<i>Bagarius bagarius</i>	Baghair	
<i>Barbus sarana</i>	Swar puti	Barb
<i>Catla catla</i>	Katla	Catla
<i>Channa spp. see Ophicephalus</i>		
<i>Carcharhinus melanopterus</i>	Kalo hangor	Black finned shark
<i>Chirocentrus dorab</i>	Karti	Wolf herring
<i>Chorimemus spp</i>	Chapa	Green fish
<i>Cirrhina mrigala</i>	Mrigal	Mrigal
<i>Cirrhina molitorella</i>		Bottom carp
<i>Cirrhina reba</i>	Vagna	
<i>Clarius batrarchus</i>	Magur	Walking catfish
<i>Coilia dussumieri</i>	Alua, Kariali	Pointed tailed anchovy
<i>Ctenopharyngodon idella</i>		Grass carp
<i>Cynoglossus spp.</i>	Kokorajib	Tongue sole
<i>Cyprinus carpio</i>		Common carp
<i>Decapterus maruadsi</i>	Nilambari	Round scad
<i>Decapterus</i>	Nilambari	Mackerel scad
<i>Dussumieri acuta</i>	Nailla	Shark
<i>Eleutheronema tetradactylus</i>	Tailya	Four threaded tassel fish
<i>Elops machnata</i>	Kundra	Lady fish
<i>Epinephalus lanceolatus</i>	Bole, Koral	Grouper
<i>Euthynnus affinis</i>	Bom maittya	Tuna
<i>Eutropicthys vacha</i>	Bacha	
<i>Gadusia chapra</i>	Chapila	
<i>Glassogobius giuris</i>	Bela	
<i>Harpodon neherus</i>	Nihari lottya	Bombay duck, Lizzard fish
<i>Heteropneustes fossilis</i>	Shingri	
<i>Hilsa ilisha</i>	Ilish (Hilsa)	River shad, Hilsa
<i>Hilsa kanagurta</i>	Chandona	Sea shad
<i>Hilsa toil</i>	Chandan ilish	
<i>Himantura uarnak</i>	Haush, Sankush	Sting ray
<i>Hypophthalmichthys molitrix</i>		Silver carp

<i>Rhinomugil sorsula</i>	Khorsula	
<i>Rita rita</i>	Rita	
<i>Rynchobatus diidensis</i>	Pitambari	Skate
<i>Sardinella longiceps</i>	Takhya	Sardine
<i>Sarotherodon mossambica</i>	Tilapia	Tilapia
<i>Sarotherodon nilotica</i>	Nilotica	Tilapia
<i>Saurida undosquamis</i>	Achila	Lizard fish
<i>Scatophagus argus</i>	Chitra, Bishtara	Spade fish
<i>Scoliodon sorrokowah</i>	Hanga	Dog fish
<i>Scomberoides commersonamus</i>	Chapa	Queen fish
<i>Scomberomorus guttatum</i>	Maittya	Spanish mackerel
<i>Sillago domina</i>	Hundra tulordandi	Lady fish
<i>Silonia silondia</i>	Shilong	
<i>Sphyranea spp.</i>	Dharkuta	Barracuda
<i>Sphyrna blockii</i>	Mioshja hanga	Hammerhead shark
<i>Tachysaurus spp</i>	Gongra guizza	Sea catfish
<i>Therapon spp.</i>	Barguni, Girpai	Therapon, Perch
<i>Triacanthus brevirostris</i>	Sukura	Tripod fish
<i>Trichiurus spp.</i>	Chhuri	Ribbon fish
<i>Trichogaster pectoralis</i>		Sepat Siam, Siamese Gourami
<i>Upeneus sulphureus</i>	Sonali bata	Red mullet, goatfish
<i>Wallago atu</i>	Boal	Catfish
Molluscs		
<i>Anadara granosa</i>		Blood clam, Cockle
<i>Crassostrea spp</i>		Oyster
<i>Mytilus smaragdinus (viridis)</i>		Green mussel
Crustaceans		
<i>Macrobrachium lancesteri</i>		Rice prawn
<i>Macrobrachium malcomsonii</i>	Chatka chingri	
<i>Macrobrachium rosenbergii</i>	Golda chingri	Giant freshwater prawn
<i>Metapenaeus affinis</i>	Hani chingri	Endeavour shrimp
<i>Metapenaeus brevicornis</i>	Kachu chingri	Short-horned shrimp, Brown shrimp
<i>Metapenaeus monoceros</i>	Hainna chingri	Sand or brown shrimp
<i>Parapenaeopsis stylifera</i>	Ruda chingri	
<i>Penaeus indicus</i>	Chapda chingri	Indian or white shrimp
<i>Penaeus japonicus</i>	Bagda chingri	Banded or Kuruma shrimp
<i>Penaeus merguensis</i>	Bara chingri	Banana or blue tail shrimp
<i>Penaeus monodon</i>	Bagda chingri	Giant tiger shrimp, Grass shrimp
<i>Penaeus penicillatus</i>	Baro chana	White shrimp
<i>Penaeus semisulcatus</i>	Bagda chingri	Red-legged shrimp

Source: Coulter and Disney (1987)

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Appendix 4: Bibliography

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