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**PADDY, FISH AND VEGETABLE MARKETING SYSTEMS
IN NORTHWEST BANGLADESH**

CURRENT SITUATION AND OPPORTUNITIES FOR INTERVENTION

**Consultancy report prepared for
CARE, Bangladesh**

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EXECUTIVE SUMMARY

Introduction

1. Go-Interfish is a production-oriented project. Agronomic practices are being disseminated without their marketing implications being explicitly taken into account and farmers are receiving little or no advice and support regarding post-harvest activities. The lack of attention paid to marketing issues is problematic, both from a sustainable livelihoods and from a project sustainability perspective.
2. This study seeks to identify a range of feasible intervention options to improve the returns from marketing by Go-Interfish project participants. In addition, it aims to provide information and analysis to inform future marketing-related research and activities by Go-Interfish and CARE.
3. The study is based on a rapid appraisal of rice, fish and vegetable marketing systems in Go-Interfish project areas. Fieldwork was conducted in Bangladesh over a four-week period, between 16 May and 14 June. The first three weeks were spent in Go-Interfish districts, visiting communities and markets. The last week was spent in Dhaka, collecting relevant documents and studies and interviewing key informants. In addition to semi-structured discussions with a wide range of market players and knowledgeable observers, formal questionnaires were administered in the study areas and Dhaka.
4. Information gaps and weaknesses and limitations in the analysis will be pointed out throughout the report in order to place the recommendations in proper perspective and highlight specific areas which need further research. Follow-up work and validation exercises will be required to translate study recommendations into action in a way that meets the specific and complex needs of end-clients in different locations, in a timely and appropriate manner.

Paddy marketing systems in Go-Interfish areas

5. Real paddy prices have been falling over the past decades. Within the same year, prices follow a bimodal seasonal pattern. Prices fall immediately after harvest, start rising as market supplies become scarcer, and peak just before the next harvest. Finally, in any particular moment in time, prices differ according to the type of paddy and the quality of the grain.
6. Go-Interfish districts are located in Northwest Bangladesh, the main paddy growing region in the country. A significant share of the paddy surplus is processed close to production areas, within the same district or in a neighbouring district. Considerable volumes are also channelled to distant mills.
7. Farmers in Go-Interfish areas have a wide range of options to choose from when marketing their paddy. They can sell at the farm-gate to itinerant traders, take their product to a neighbouring paddy market, or sell at a nearby mill. Lack of buyers is not a problem.
8. Paddy markets in the Northwest are competitive and quite efficient. Marketing margins are very low and the grower's share of mill gate purchasing price is high.

Differences between farm-gate, market, and mill-gate prices are small. Quite significantly, small farmers receive similar farm-gate and market prices to large farmers, a strong indication not only of fair treatment in the market place but also that the rationale for group marketing is largely absent.

9. Hence, and generally speaking, farmers receive low prices not because of unfair trading practices by buyers, but because of supply and demand factors. Small and marginal farmers sell mostly during the peak marketing season, when prices are lower. Farmers prices may also be affected by quality problems resulting from insufficient drying of paddy.

10. Distress sales are essentially motivated by acute cash needs to undertake consumption and production expenditures and repay loans. Storage constraints or losses do not seem to play a significant role in determining farmers' selling behaviour.

11. Farmers are largely dependent on production loans to undertake paddy cultivation. Part of the reason lies in the input intensive character of paddy farming. Informal lenders are an important source of credit and the interest rates charged can be quite high. Many farmers have difficulties in accumulating capital from paddy growing and sales, finding themselves trapped in a vicious debt cycle.

12. Liquidity constraints are also experienced further up the marketing chain and affect most market participants. Not surprisingly, and in view of the need to secure smooth business transactions and volumes, informal credit flows between market players at different tiers of the marketing system are common.

13. Working capital constraints help explaining the low level of storage at the trader and miller levels. Other factors include the need to secure high business turnover due to low profit margins, the risk of unexpected and adverse price changes, the cost of storage, and relatively moderate seasonal price fluctuations.

14. Although small paddy volumes are channelled through the public grain procurement system, the government is an important and very attractive client because of the favourable prices paid. Competition amongst potential suppliers to government procurement centres is high, and as a result most farmers find themselves without access to such market outlets. For this and other reasons, the system is not achieving one of its main objectives, which is to support farmer prices.

15. It is not easy to recommend marketing interventions in the context well developed and largely efficient markets. Access to markets and buyers is not a problem. Go-Interfish farmers are well exposed to paddy marketing and do not seem to face serious difficulties in accessing market information or existing market channels. Product losses due to storage are relatively marginal. Spot prices paid to small and large farmers are very similar.

16. Still, Go-Interfish participants could benefit from inventory credit interventions to enable them to exploit seasonal price variations. Promoting access to government procurement centres and advocacy work to reform the procurement system is another intervention area that could potentially generate tangible benefits to project farmers.

Fish Marketing systems in Go-Interfish areas

17. Go-Interfish areas are relatively marginal from a fish production viewpoint and largely dependent on outside supplies. Market prospects for fresh food fish are good given the large gap between local supply and demand and the possibility that such gaps may widen over the coming years.

18. Fish markets in the region function in a fairly efficient manner, taking into account that fresh fish is an extremely perishable commodity that must be transported under poor preservation conditions, by a large number of players, and in relatively small quantities to dispersed locations.

19. Producers are in a position to compete with outside supplies due to the shorter distances to retail markets and the reduced number of marketing intermediaries involved. Also, local fish arrives at markets in fresher condition than imported fish, and is therefore highly prized by traders.

20. Informal credit flows between different market players are pervasive in view of the acute cash constraints faced by clients and the need to secure sales. For commission agents, interest-free loans or advances may also form part of a strategy to secure scarce local supplies.

21. Go-Interfish farmers generally benefit from the presence of various market outlet options within relatively short distances. They may sell at their village to consumers, itinerant traders and rural market retailers or take the catch to nearby rural or town markets.

22. Each market outlet offers advantages and disadvantages. Although generalisations may not apply in certain cases, it may be concluded that sales at the farm-gate are very convenient but command the lowest prices and the payment is often delayed by a few days. Town markets are a much better option in terms of prices and absorptive capacity, and producers are paid on the spot. The price situation and payment conditions (credit/cash) in village markets varies considerably from place to place and from transaction to transaction.

23. Prices are very sensitive to supplies in a particular day, and the risk of selling when markets are well supplied is real. Prices are generally higher during the off-season months, between March and June. Major carps and catfish are the most valuable cultural species, and large-sized fish commands a considerable price premium in the market.

24. A wide and complex range of factors influence producers' marketing decisions and strategies. These include production levels, degree of commercial orientation, status issues, cash needs, time constraints, distance to markets, availability of refuge waters, risk of theft and disease, and access to market information and networks.

25. Go-Interfish farmers are constrained in their fish marketing activities by low production levels, problems in accessing good quality seed at a reasonable price, difficult access to refuge waters, acute cash needs, labour constraints, and limited market knowledge.

26. As a result of these factors, farmers often sell marginal quantities of undersized fish during the peak season and at the farm-gate. This is the worst possible marketing scenario in

terms of price, but may well be the best marketing strategy for farmers given their resources and constraints.

27. Four possible intervention areas were identified as having the potential to address some of the constraints and needs of many Go-Interfish farmers. These include: i) the integration of marketing-related issues into extension messages; ii) support to group formation and development for food fish marketing; iii) the improvement of access to good quality fish seed in project areas; and iv) the promotion of farmer co-operation for food fish stocking.

Vegetable marketing systems in Go-Interfish areas

28. Northwest Bangladesh is an important vegetable growing region. While Go-Interfish areas produce significant exportable surpluses during peak harvesting periods, some thanas and districts show much higher production levels than others, and inter-district transactions are significant. Imports from outside areas are also common, especially during off-season periods.

29. Vegetable production compares very favourably to other crops in terms of profitability. Yet, farmers' interest in expanding cultivation is significantly hindered by a wide range of production and marketing constraints and risks. These include insufficient technical know-how, labour constraints, high yield and price variability, and depressed prices during peak harvesting and marketing periods.

30. Extreme inter- and intra-annual price variations are one of the main risks vegetable growers face. The implications are that farmers cannot anticipate future prices at the time of planting. At the same time, because most vegetables cannot be stored for more than a few days due to perishability, growers have limited scope to postpone sales in situations of unfavourable market prices.

31. Vegetable prices show a marked seasonal pattern. They are generally lower during the first semester of the year and rise during the second half of the year, peaking around October or November. Price patterns vary between different vegetables and areas. Consequently, marketing interventions in a particular area must be informed by crop-specific price information for that same area.

32. Vegetable prices also vary significantly with quality. The main product quality determinants are freshness, degree of insect infestation, size, shape, and colour.

33. Go-Interfish vegetable growers generally have a small marketable surplus. Although women are heavily involved in post-harvest activities, it is the man that normally markets the produce. Households normally have various marketing options. They can sell at the farm-gate to neighbours, itinerant traders, wholesalers, and rural market retailers. They can also dispose of their vegetables in rural retail markets, wholesale assembly markets, and urban retail and wholesale markets.

34. Village level sales are the most convenient but the least attractive in terms of price. Urban markets are the most attractive with respect to prices. However, because of small marketable surpluses and acute time constraints, most Go-Interfish farmers either sell at the farm-gate or channel their production to nearby rural markets.

35. One of the main sources of inefficiency of vegetable marketing systems is the large number of intermediaries involved in the product chain. Vegetables may change hands four or five times before reaching the consumer, especially when they are sold to distant markets. Long product chains result in excessive quality losses and low producer prices.

36. Vegetable traders in Go-Interfish areas generally operate with very high margins. As a result, farmers are being deprived of a considerable share of the retail price. This problem is most acute the larger the number of market intermediaries and the longer the distances between the point of production and consumption centres.

37. High margins are a consequence of many factors. These include inadequate access to market information by farmers; their weak bargaining position due to the need to quickly dispose of production to avoid spoilage; the small quantities handled by traders, especially retailers and small itinerant traders; marketing costs, especially labour and transport; and high marketing risks and product losses before, during, and after transport.

38. Go-Interfish vegetable growers face a wide range of marketing problems and constraints. For example, unreliable supplies of low quality seed affect product quality and limit the ability of growers to exploit off-season marketing opportunities. Moreover, vegetable prices are not only extremely volatile, but also unduly depressed during peak harvesting and marketing periods. Product perishability is another commonly cited problem. Finally, Go-Interfish farmers lack a premium market for pesticide-free vegetables.

39. There is scope for Go-Interfish project to address some of these problems through carefully designed interventions. There is moreover an opportunity to learn from other CARE projects which have recently developed pilot marketing initiatives for vegetable marketing.

40. Six intervention areas with the potential to improve farmer returns from vegetable marketing were identified. The development of local seed production and markets is one. Another is the integration of marketing issues into project extension work. A third area is the promotion of off-season vegetable production and marketing opportunities. Support to group marketing activities and the development of direct market channels for pesticide-free vegetables are two other intervention options. The promotion of linkages between selected project farmers and vegetable exporters for contract farming is suggested as a final possible area of intervention.

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CHAPTER ONE

INTRODUCTION

1.1 Background

“Greater Opportunities for Integrated Rice-Fish Production Systems” (GO-Interfish) is a five-year project implemented by CARE in Northwest Bangladesh that promotes integrated rice-fish production, integrated pest management practices, and the use of field dikes for vegetable production. Recently the project decided to more actively start promoting homestead-based gardening and pond fish culture alongside other intervention areas to further enhance women’s participation and create new opportunities for improving farming household livelihoods.

Project activities began in June 1999. While only Dinajpur and Thakurgaon districts were covered during the first phase, the project is now gradually expanding to other neighbouring districts. By the end of 2001 Go-Interfish will be active in six districts of Northwest Bangladesh (Dinajpur, Kurigram, Nilphamari, Panchagar, Rangpur and Thakurgaon), either directly or through partner organisations.

Go-Interfish targets a total of 400,000 small and marginal male and female farmers. Most participating households own less than 1.5 acres of land. By improving the capacity of poor farming households to manage diversified and integrated rice field production, CARE aims to contribute to improved family incomes and increased stability, biodiversity and productivity of rice fields.

Primary adoption of disseminated technologies and practices is to be achieved through a participatory and problem-solving approach centred on Farmer Field Schools (FFS), which serve as the focal point for extension activities within the community. Secondary adoption is expected to result from the exposure of non-participants to the new practices and activities embraced by direct project beneficiaries; the selection and training of farmer leaders to act as informal extension agents within the community; and the development of links between field school activities, community members, and local networks and institutions. Partnerships with local NGOs, the Department for Agricultural Extension (DAE) and the Department of Fisheries (DoF) are also being developed to foster wider and lower cost replication of project extension approaches.

Go-Interfish is a production-oriented project. Marketing-related activities or interventions have not been given proper consideration during the project design, staff recruitment or initial implementation stages. As a result, agronomic practices are being disseminated without their marketing implications being explicitly taken into account. Similarly, farmers are receiving little or no advice and support regarding post-harvest activities. The production-oriented nature of the project is understandable in view of the type of target beneficiary, the difficulties in effectively intervening in the marketing arena, and the importance attributed by CARE to improved household consumption and longer-term environmental sustainability. However, the fact that most project participants sell part of their agricultural production and

are quite vocal in expressing their discontent about the prices their produce is being sold for should not be overlooked.

Clearly, the lack of attention paid to marketing issues is problematic, both from a sustainable livelihoods and from a project sustainability perspective:

- Generally speaking, the more successful project participants are in selling their produce the greater their ability to achieve positive livelihood outcomes through improved incomes and increased capacity to undertake expenditures and investments in areas such as nutrition, health, sanitation, education, land improvement, transport and storage. Moreover, improved marketing activities by farming households are associated with the development of networks and trust relations with other community members, service providers and traders. In other words, while marketing outcomes are largely determined by households' initial livelihood situation, such outcomes also influence in a decisive manner their livelihood trajectories.
- At the same time, remunerative paddy, fish and vegetable prices are critical if farmers are to adopt and invest in the technologies and practices disseminated by Go-Interfish. Hence, the ability of project participants to intervene in marketing processes and interact with different market players is intimately related to effective and sustainable project interventions.

Aware of the importance of successful marketing by end clients for achieving project objectives, CARE approached the Natural Resources Institute (NRI) to undertake a study on the paddy, vegetable and fish marketing systems in Northwest Bangladesh to inform future project strategies, interventions and activities in this area.

1.2 Study objectives

This study seeks to identify a range of feasible intervention options to improve the returns from marketing activities undertaken by Go-Interfish direct and indirect target beneficiaries¹. In addition, it aims to provide information and analysis to inform future marketing-related research and activities by Go-Interfish and CARE. Recommendations will be based on an analysis of paddy, vegetable and fish marketing systems in Northwest Bangladesh and an understanding of the circumstances and environment faced by project participants. If deemed appropriate, the study will be followed by the design and delivery of training to selected Go-Interfish and other CARE staff on how to implement the study recommendations.

It is important to stress that any recommendations must take into account three aspects:

- First, CARE and partner organisations have limited experience and expertise in implementing marketing-oriented interventions. Consequently, any activities in this area should be regarded as part of a learning-by-doing process that is just beginning. Complex and over-ambitious interventions should generally be avoided.

¹ See Terms of Reference (Annex two).

- Second, Go-Interfish is an on-going project that will terminate by mid-2003. In some communities the project is phasing out whereas in others it is just starting activities. This means that there is greater scope for intervention in the latter locations.
- Third, while Go-Interfish farming households generally produce small surpluses for sale and face acute resource constraints, the picture is not uniform. Location-specific and inter-household differences due to economic, social, cultural and other factors should not be underestimated. The implications of this are twofold. On the one hand, interventions should be realistic as to what can be achieved over the short- to medium-term. On the other hand, across the board approaches may not adequately respond to the realities and needs of different households and locations.

1.3 Study approach and methodology

After consultation with CARE, it was decided to conduct a rapid appraisal of marketing systems for rice, vegetables and fish produced in Northwest Bangladesh using sub-sector analysis. By focusing on key links in vertical commodity sub-systems, such approach is well suited to an assessment of problems and opportunities and the identification of leveraged interventions, defined as having the potential to benefit large numbers of sub-sector participants at a relatively low cost.²

However, it is important to bear in mind that while the sub-sector approach provides insight into the entire commodity sub-system, it is essentially concerned with those points in the marketing chain where large amounts of product pass through the hands of a small number of participants. In contrast, the focus of this study is on the problems and constraints faced by a well-identified group of farmers in Go-Interfish project areas. Accordingly, the study is centred on interventions which are likely to directly benefit this group, and not so much on promising lines of intervention which address critical constraints at the wholesale, processing or exporting stages but whose benefits are indiscriminately spread over a large number of farmers and geographical areas, with no clear link to Go-Interfish participants. The study also gives little emphasis to policy issues, however important they may be, as this is an area that falls outside the scope of the project.

This study is essentially based on fieldwork conducted in Bangladesh over a four-week period, between 16 May and 14 June. Visits to villages and markets and discussions with CARE field staff, selected partner NGOs and local government officials in several Go-Interfish areas were carried out over the first three weeks. The last week was spent in Dhaka collecting relevant documents and studies and interviewing key informants in government, non-government and donor organisations and projects.³ Most report writing was done in the United Kingdom (UK) over a three-week period.

Due to time constraints, there was a need to be selective in the choice of study areas. Hence, it was decided to concentrate the fieldwork in Dinajpur District and a few chosen areas of Rangpur and Thakurgaon districts, as shown in table 1.1. Consequently, while some study findings may generally apply to most Go-Interfish project areas, other may not due to

² See Holtzman *et al.* (1993) for a thorough discussion on rapid market appraisal methodologies and Miles (1995) for a simple and very didactic description of the sub-sector approach.

³ See Annex three for a list of people and institutions contacted in Bangladesh.

location-specific production and marketing dynamics. Care should therefore be taken when interpreting the conclusions and recommendations of this report, and validation exercises are required before translating them into practice.

Table 1.1 Visited Areas

Districts	Areas
Dinajpur	Dinajpur Sadar Thana; Bonchagonj Thana; Chiribandar Thana; Kaharol Thana; Parbatipur Thana
Nilphamari	Saidpur town
Rangpur	Rangpur Sadar Thana; Mithapurkur Thana
Thakurgaon	Thakurgaon Sadar Thana

In-depth informal focus group discussions with male and female project farmers were based on checklists of key issues (annexes 4 and 5). Male and female farmers were interviewed separately to allow women to express their views as openly as possible. Discussions with male farmers centred on issues such as post-harvest practices and activities, timing of sales, means of transport used, market channels, marketing arrangements, prices, group dynamics, and production and marketing constraints. In the case of female farmers, the consultant was particularly interested in assessing their participation in production and post-harvest decision-making processes and activities, with a special emphasis on marketing.

Topic guidelines (annexes six and seven) were also produced to structure discussions with a wide range of market participants, including itinerant traders, commission agents, wholesalers, retailers and rice millers. Product flows, market channels, means of transport used, marketing arrangements and costs, prices, and system-wide and stage-specific constraints were the main issues examined. Triangulation techniques were used in order to crosscheck the information provided by different informants.

The topics covered during discussions with supporting organisations (government and non-government) and knowledgeable observers (e.g. in donor agencies and donor-funded projects) differed according to the type of institution or person interviewed. Issues and opportunities in agricultural and fish marketing, lessons learned from marketing-related project interventions, and the role of NGOs in agricultural marketing were topics of discussion. Knowledgeable observers often have a historical and system-wide sub-sector perspective, thereby being well positioned to identify trends, constraints and opportunities.

In addition to informal discussions with a wide range of sub-sector participants and knowledgeable observers, formal questionnaires (annex eight to ten) were administered by selected Go-Interfish field staff in the study areas. These were developed during the final stages of the consultant's visit, taking into account the information collected in the field, and as a result there was no time to pre-test the questionnaires. Despite these constraints, it was felt that structured interviews would be a useful tool to complement and strengthen the validity of fieldwork findings, especially with regards to market channels, prices, marketing costs and trader margins. It is important to bear in mind however, that the objective was not to undertake any sort of statistical analysis, which would be unrealistic given the little time available to prepare and conduct the interviews.

The survey sample, after excluding a few invalid questionnaires due to errors and inconsistencies, comprised 208 randomly selected market participants. Farmers, itinerant

traders, wholesalers, commission agents, retailers and millers were interviewed. Questionnaires for different commodities (e.g. vegetables and fish) were sometimes administered to the same farmer. Table 1.2 presents the distribution of respondents.

Table 1.2 Survey sample

	Paddy N= 61	Vegetables N=80	Fish N=67
Farmers	41	42	43
Village market retailers	-	6	6
Itinerant traders	10	-	-
Wholesalers	2	4	-
Commission agents	-	6	7
Town market retailers	-	12	11
Millers	8	-	-
Dhaka wholesalers	-	10	-

Farmer interviews were conducted in 14 villages of Dinajpur, Kurigram, Panchangar, Rangpur and Thakurgaon districts. Traders were interviewed in 13 rural markets and 10 town markets. Ideally, interviews should have been carried out in one village market, the closest thana town market and the district town market for every sample village, so as to trace the different local marketing chains. Unfortunately, this was not possible due to time constraints. During the fieldwork it was found that Dhaka was an important market for vegetables grown in Go-Interfish project areas, but the tight schedule did not allow for any visits to vegetable markets in the capital. In order to fill this gap, one Go-Interfish staff member conducted formal interviews with 10 vegetable wholesalers/commission agents in Dhaka's Kawran Bazaar and Sham Bazaar.

1.4 Study limitations

A study of this nature, conducted over a short period, cannot hope to offer full insight into all the complexities of paddy, vegetable and fish marketing in Go-Interfish areas. The dearth of pertinent region- and crop-specific secondary data and socio-economic and anthropological background studies leaves the analyst in a difficult position. Many are the factors influencing product flows and market transactions, some of which are difficult to capture from a rapid market appraisal visit. Clearly, many questions will remain unanswered.

Therefore, the aim of this study is not to present a comprehensive and in-depth overview of paddy, vegetable and fish marketing systems in Go-Interfish areas, but rather to highlight some key sub-sector features and trends, shed some light on vertical links and constraints along the product chain, and in so doing, gather useful elements to inform future Go-Interfish intervention strategies and activities.

Information gaps and weaknesses and limitations in the analysis will be pointed out throughout the report in order to place the recommendations in proper perspective and highlight specific areas which need further research. This study should therefore be seen as a first attempt by CARE Bangladesh to look at marketing issues in the context of Go-Interfish project. As such, it offers an initial overview of key aspects that must be taken into consideration in any successful strategy to enhance the capacity of project farmers to

intervene in markets. Follow-up work and validation exercises will be required to translate study recommendations into action in a way that meets the specific, complex needs of end-clients in different project locations in a timely and adequate manner.

1.5 Structure of the Report

The report is divided in five chapters. Following this introduction, chapters two to four describe paddy, fish and vegetable marketing systems in Go-Interfish project areas. Key sub-sector features and trends, product flows, and marketing channels and arrangements are described. Trading margins are calculated to assess the efficiency of marketing systems and identify potential opportunities for Go-Interfish farmers. Finally, the main marketing-related problems and constraints faced by traders and farmers are analysed. Based on the information and evidence collected, opportunities for intervention are identified.

Annex one contains a list of references used to inform the analysis. Annex two includes the terms of reference for this study. Annex three provides a list of institutions contacted in the study areas and Dhaka. Annexes four to seven include the checklists used to guide informal discussions with farmers, traders and millers. Annexes eight to ten show the formal questionnaires administered to farmers and different market players. Finally, annex eleven presents marketing margins in different fish markets in Go-Interfish areas.

CHAPTER TWO

PADDY MARKETING SYSTEMS IN NORTHWEST BANGLADESH

2.1 Introduction

Many studies have been conducted in the past on paddy and rice markets in Bangladesh. This section draws heavily on this important body of literature, complementing it with information and findings from fieldwork. The analysis concentrates on paddy since the focus is on interventions that have the potential to directly benefit Go-Interfish farmers. Because CARE will not intervene beyond the milling stage, looking at the whole rice sub-sector adds little value to the analysis. Nevertheless, the close interdependence of rice and paddy markets must be acknowledged, and for this reason information on rice market trends and features is presented when considered useful for a good understanding of the issues under discussion.

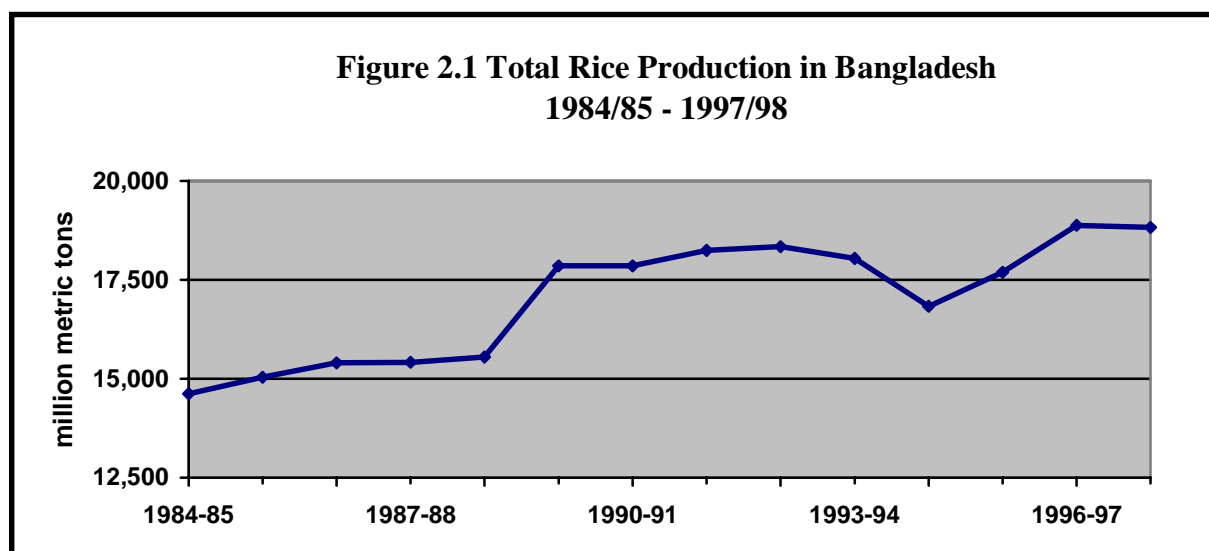
2.2 Rice production in Bangladesh

Rice dominates the landscape of rural Bangladesh. Nearly three-quarters of total gross cropped area are cultivated with rice. For most farming households, paddy is the single most important crop and absolutely central to their livelihoods, representing a major source of calories and income. Paid work in paddy farms and rice mills, and involvement in paddy and rice trading, provides a very significant source of seasonal employment and income to many rural and urban households. In Bangladesh, rice accounts for more than 90 percent of total foodgrain output, approximately half of total agricultural production and one-quarter of GDP.

Approximately 500 different varieties of rice are grown in Bangladesh in three different seasons:

- *Aman* is the leading paddy growing season, contributing approximately half of total annual production. *Aman* rice is transplanted to the fields between June and August, before the floods, being harvested in November or December, as flood waters recede. More than half of the *aman* paddy area is still planted with local varieties. Local speciality or aromatic rice varieties are grown during this season.
- The *boro* or winter season has gained importance during the 1980s and 1990s, following the development of groundwater irrigation and widespread adoption of high-yielding varieties (HYV) and fertilisers. This season is now responsible for approximately 40 percent of annual rice production. Planting of *boro* rice takes place in November and December while harvesting is carried out between April and June.
- Farmers may also sow rice in late March or April to take advantage of early monsoon rains, harvesting in July and August. This is known as the *aus* season. *Aus* production has become relatively marginal, and at present accounts for a low 10 percent share of total output. More than two-thirds of *aus* rice areas are planted with traditional varieties.

Rice production expanded significantly and above population growth rates during the second half of the 1980s (Figure 2.1). This growth was driven by investments in irrigation, increased fertiliser use, and increased adoption of high-yielding varieties. The liberalisation of restrictions on tubewell siting and the importation of pumps and small diesel engines played an important role in this process, opening up new opportunities for dry-season irrigated cultivation (Ahmed, 2000).



Source: Bangladesh Bulletin of Statistics (various), in Dorosh (2000)

Production fell during the early 1990s. Although it has since recovered, concerns have been raised regarding the sustainability of previous production gains and the likelihood that similar growth rates will be achieved in the near future (Brandon, 1998; Dorosh, 2000; Mahmud, 1998; McIntire, 1998):

- First, virtually no land is available for an expansion of cultivated areas. There is some scope for increased cropping intensity, but that will require significant investments in irrigation.
- Secondly, soil fertility appears to be in decline as a result of various factors, including increased intensity of land use and indiscriminate application of fertilisers.
- Finally, in view of the long-term decline in real paddy prices (section 2.6), it is not clear whether farmers have the incentives to invest in improved technologies.

Uncertainties over the future prospects for rice production are also fuelled by past yield trends. With an average yield of 2.7 tonnes of paddy per hectare, Bangladesh still lags behind other Asian rice-producing countries with respect to productivity. Past increases in yields were largely driven by increased use of modern varieties and not a consequence of variety-specific improved performance. Nearly all the *boro* rice area and half of total rice area in Bangladesh is now planted with improved varieties. Further adoption of high-yielding varieties requires costly water control and irrigation investments. Variety development and improved farming practices offer an alternative yield-enhancing path, but this poses considerable challenges to national agricultural research and extension systems.

2.3 Paddy marketing in Bangladesh

Before marketing, paddy is cleaned of foreign matter, soaked, dried and packed in jute bags of approximately 80 kilograms. The paddy is then sold at the farm-gate or channelled to primary and secondary markets and mills. While the time of sale is largely influenced by the cash needs of farming households, expectations about future prices and product losses during storage also play a role in farmers' marketing decisions. Paddy marketing activities are exclusively undertaken by men.

Approximately half of the total paddy harvest is sold in the market (Chowdhury, 1992; Chowdhury and Haggblade, 2000). This marketed share is high considering that paddy cultivation is essentially undertaken by small farming households, who need to retain at least part of the harvest to satisfy their own consumption needs. It is also high in historical perspective. Four decades ago the marketed share was below 15 percent.

Both supply and demand factors explain the steady rise in the proportion of total production that is channelled to the market. On the supply side, growing crop intensity and increasing yields have led to a rise in the number of farmers that are able to generate a surplus⁴. On the demand side, urbanisation and growth of rural non-farm incomes have increased the number of households that depend on market purchases to meet their food needs.

It is interesting to note that marketed shares are much higher for *boro* than *aman* paddy. On average, two-thirds of the *boro* harvest is sold whereas only one-third of the *aman* crop is marketed. Two main factors explain this difference:

- *Boro* rice requires more external inputs. In order to pay for water and fuel and buy improved seeds and fertilisers, farmers often need to borrow money from institutional and non-institutional sources or to purchase inputs on credit. After the harvest, many have to rely on paddy sales to repay the loans.
- In addition, *boro* rice is more difficult to store, not only because modern varieties retain more moisture, but also because the paddy is harvested at a time when humidity is high and open-air drying difficult.

Marketed volumes have increased tenfold over the past four decades (Chowdhury and Haggblade, 2000; Chowdhury, 1992). Marketing systems had to undergo profound changes in order to absorb such large inflows. Improvements in transport infrastructure and telecommunications have clearly played a role in facilitating product flows from farms to mills and from mills to consumer centres. More importantly, during that period the number of paddy traders and rice mills expanded at an impressive rate. Estimates from the early 1990s indicate that 48,000 itinerant traders were then involved in paddy marketing, compared to 4,000 three decades earlier. The number of wholesalers ascended to 9,500. And while only 6,155 mills were operational in the mid-1960s, that number had increased to 50,868 by the early 1990s.

⁴ It is estimated that 0.16 hectares of land are enough to satisfy the foodgrain needs of a family growing HIV *boro* and transplanted *aman*. During good production years, an estimated 70 percent of farming households are net food sellers. Even deficit farmers market part of their harvest because of cash needs. (Chowdhury and Haggblade, 2000)

2.4 Paddy processing in Bangladesh

Almost all rice mills in Bangladesh are modest in scale, indicating that the bulk of derived paddy demand originates from a large number of small and geographically dispersed units. These mills employ simple mechanised technologies and have the capacity to husk approximately 0.6 tons of paddy per hour. Small mills can be categorised into full service and husking mills. The former comprise parboiling units and drying yards and are responsible for the whole processing operations whereas the latter merely provide custom milling services to home-based and itinerant paddy entrepreneurs that lack their own milling facilities.

In addition, some large and automatic mills operate in the country. In the early 1990s, there were nearly 500 large-scale mills and 90 automatic mills (Chowdhury, 1992). Large mills employ similar technology to smaller units but can process up to one ton of paddy per hour. They are able to achieve higher milling recovery rates and produce a higher quality product through the use of multiple hullers, which results in a more gradual and finer husking and polishing process. Automatic mills employ modern technologies, having the capacity to process up to two tons per hour and meet stricter product quality standards.

2.5 Rice imports and exports

Bangladesh is a net importer of rice. Although self-sufficient in good production years, the country needs to import rice during less favourable years. Rice aid inflows were never very significant and have practically ceased during the 1990s. Rising domestic production levels, improved government capacity to import grain through commercial channels, and the liberalisation of rice imports have all contributed to the decline of rice aid inflows. The government held a monopoly on commercial rice imports until the early 1990s, but the private sector has since become the main actor in the rice import trade.

Table 2.1 Rice Imports in Bangladesh, 1980-1998

	Food Aid	Government	Private	Total
	thousand metric tonnes			
1985	125	570	0	695
1986	27	10	0	37
1987	108	150	0	258
1988	192	398	0	590
1989	40	21	0	61
1990	41	258	0	299
1991	10	0	0	10
1992	39	0	0	39
1993	19	0	0	19
1994	0	0	74	74
1995	0	230	583	813
1996	1	487	650	1,138
1997	10	9	15	34
1998	0	98	993	1,091

Source: Food Policy Monitoring Unit, in Dorosh (2000).

Many traders have become involved in rice imports since 1993, when the ban on private sector imports was lifted. The private sector has shown a quick response capacity in the advent of poor harvests and the resulting rise in domestic prices, which provides an incentive for cheaper supplies to be imported from abroad (Dorosh, 2000 and 2001). Export liberalisation in India has also facilitated the involvement of a large number of small and medium-sized operators in rice imports. Rice can be brought in from India by truck and in small lots within a relatively short span of time. In contrast, imports from alternative sources such as Thailand and Vietnam must be shipped in relatively large volumes by sea.

Bangladesh is not a rice exporting country. The government has at times expressed an interest in seeing rice exports developing as a means to improve foreign exchange revenues and sustain producer prices, especially in years of bumper harvests. Whilst Bangladesh faces poor export prospects for common rice⁵, some local aromatic varieties (in particular kaligira and kataribogh) are believed to have the potential to compete with Indian and Pakistani basmati rice in foreign markets (Ateng, 1998; Goletti *et al.*, 2000; Stringfellow and Swetman, 1996). These varieties are very appreciated in Bangladesh for their aromatic qualities and command higher prices in the domestic market. Even in the absence of an exportable surplus, speciality rice could be exported to premium markets, for example in Europe and the Middle East, and cheaper coarse rice imported from India or other sources to meet domestic requirements.

However, various problems and constraints stand in the way of increased production and export of aromatic paddy and rice (Ateng, 1998; Goletti *et al.*, 2000; Stringfellow and Swetman, 1996). The yield of local aromatic varieties is about half of that achieved by modern varieties. Aromatic paddy is also more difficult to market than high-yielding varieties, with farmers having to travel to specialised rural markets in order to dispose of their production. Coarse paddy, in turn, can be easily sold at the farm-gate or in nearby rural markets. Farmers cannot be expected to expand production of aromatic paddy unless current yield problems are overcome and quality standards improved through focused and effective research efforts.

Furthermore, to successfully export aromatic rice, Bangladesh needs to improve its export infrastructure, in particular with regards to storage facilities. The country also needs to develop internationally recognised grades and standards and aggressively promote the qualities of local aromatic varieties in target markets. Trade barriers in importing countries must be addressed through bilateral trade negotiations. In sum, it will take some time and concerted private and public sector efforts before Bangladesh is in a position to establish itself as an exporter of aromatic rice.

2.6 Price trends and behaviour

i. Real price trends

The consultant had no access to time-series data on real paddy prices. However, judging by the long-term decline in the real price of rice, which dropped 34 percent between 1977-79 and 1991-93 (Dorosh, 2000), it is reasonable to conclude that the real price of paddy has been

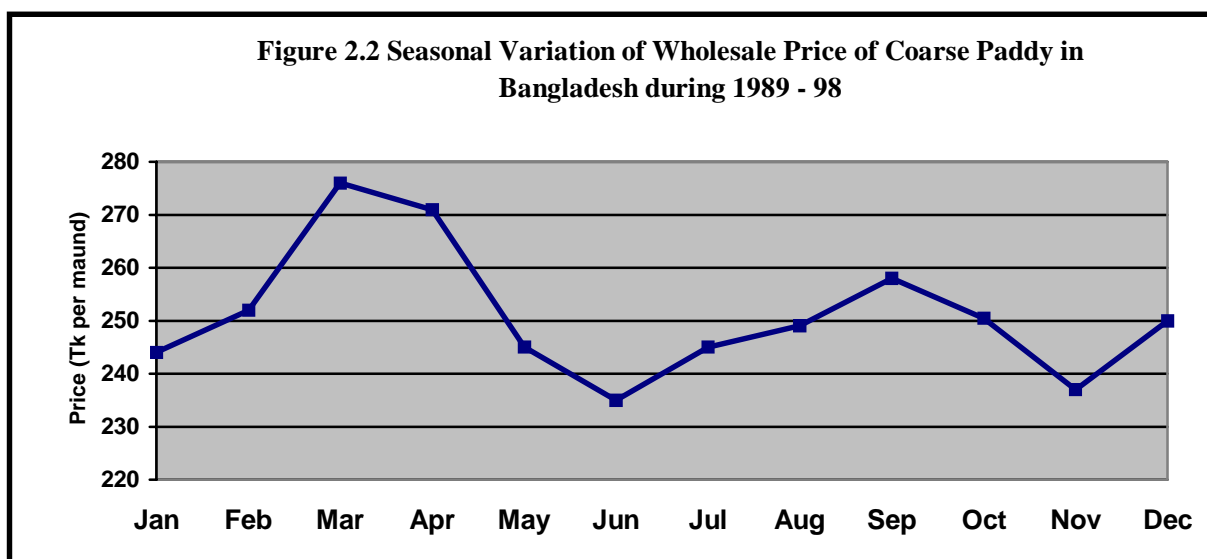
⁵ Problems associated with coarse rice exports include poor quality, intense competition from traditional exporting countries, and a thin and stagnant world market.

falling over the past decades. Modest increases in supply coupled with a relatively stagnant demand explain this steep decline in prices.

Domestic demand is likely to remain sluggish in the future in view of declining population growth rates and the tendency for the share of rice in total household consumption to fall as incomes rise and urbanisation accelerates (Ahmed, 2000). Bangladesh has reached a point in which rising incomes and declining prices have negligible impact on rice demand. At the same time, imports will continue to compensate for any future weather-induced shortages in local rice supplies. Consequently, and given that a surge in rice exports is not on the horizon, the real price of paddy may well continue falling in the coming years. While consumers will certainly benefit from such scenario, the profitability of paddy cultivation will be further squeezed.

ii. Seasonal price behaviour

Within the same year, paddy prices follow a bimodal seasonal pattern. Prices fall immediately after harvest, start rising as market supplies become scarcer, and peak just before the next harvest. Accordingly, prices decline from mid-April to June, at the onset of the *boro* marketing season, and then slowly rise until mid-November. They fall again during the peak *aman* marketing season, which goes until January, and follow a rising trend from February to mid-April.



Source: Goodland *et al.* (forthcoming)

Seasonal paddy price variability is less pronounced than often thought. First, the existence of two main seasons and the fair degree of commercialisation of paddy production contribute to stabilise market supplies and prices throughout the year. Second, when prices rise above certain levels, the government intervenes in the market by releasing public grain stocks, which has a moderating impact on prices. Finally, although the extent to which traders engage in storage activities is somewhat limited, farmers are known to hold large stocks

during the season for future consumption and sale⁶. If prices rise considerably, they have an incentive to release stocks, thereby softening the price increase.

Figure 2.2 depicts seasonal variations of wholesale coarse paddy prices during the 1990s. On average, within each season the difference between the trough and peak in prices is of approximately 15 percent. However, it appears that storage is more beneficial to farmers during the *aman* season, especially if they manage to hold on to their surplus until late March or early April, when prices reach their annual peak. In the *boro* season, prices fall steeply immediately after harvest, but then increase only gradually and by less than 10 percent on average over a four-month period.

iii. Factors that influence prices in a given moment

In any particular moment in time, prices differ according to the type of paddy. Compared to finer varieties, coarse paddy is generally sold at a discount. The latter now accounts for more than 70 percent of total production. Different varieties also command different prices, depending on the size, texture, flavour and colour of the grain. It is important to stress, however, that price is not necessarily an indication of profitability due to the fact that yields, production costs, and susceptibility to disease and adverse weather conditions vary among different varieties.

The quality of the grain is another major determinant of prices. The drier, cleaner and more mature the paddy is the higher will be its market price. Because these product characteristics critically influence processing outturns and rice quality, traders and millers spend considerable amounts of time visually inspecting the quality of purchased paddy. The Fair Average Quality standard applied in government procurement, which stipulates a maximum moisture content of 14 percent, is normally taken as reference for assessing the quality of the grain. Farmers that lack space or time to properly clean and dry their paddy are therefore at a disadvantage.

2.7 Government intervention in paddy and rice markets

In the past the Government of Bangladesh has intervened heavily in paddy and rice markets (Ahmed *et al.*, 2000; Chowdhury and Haggblade, 2000). Until recently, the Ministry of Food had a monopoly on rice imports and was directly involved in the management of a large-scale grain procurement, stocking and distribution system. These interventions were essentially aimed at supporting producer prices, stabilising consumer prices, preventing acute shortages in cases of failed harvests, and providing access to food to poor and vulnerable households.

Since the late 1980s, public intervention in foodgrain markets has undergone radical changes in size and shape. For example, ration channels were abolished in 1992 and the ban on private imports was lifted in 1993. The attention is now focused on a reduced public procurement system and targeted food delivery to the poor through vulnerable group feeding, food-for-work and food-for-education programmes. The public food distribution system was significantly downsized as a result of these changes. Factors that contributed to food policy

⁶ During the early 1990s, on-farm stocks accounted for more than three-quarters of total private stocks, including both paddy and rice traders and mills. (Chowdhury, 1992)

reforms included increased domestic grain production, reduced seasonal price variations, the need to save scarce budget resources, and donor pressure.

The public procurement system is of particular interest to this study. A network of government procurement centres exists throughout the country. Through these centres, the government undertakes purchases of paddy and rice, which are kept as a food security and price stabilisation stock and used in targeted food programmes. One of the objectives of this system is to support farmer prices through favourable procurement prices and a reduction in the quantities of paddy and rice that are channelled to markets. Procurement volumes vary from year to year in accordance to prevailing market circumstances and the level of public stocks. Procurement prices, which are announced at the beginning of the *boro* and *aman* marketing seasons, and are generally set well above market levels.

It appears that the system is failing to achieve its intended price support objectives (Goodland *et al.*, forthcoming; Shahabuddin and Islam, 1999). According to most analyses, the impact of public procurement on farm-gate prices is at most negligible:

- Less than 5 percent of the total annual rice and paddy trade is channelled to government procurement centres. Such modest volumes cannot be expected to have a significant impact on prices.
- At the same time, public procurement is spread through a three-month period during each season. The impact on producer prices would be greater if purchases were concentrated during harvest time and the following month, when the fall in prices is more significant.
- Finally, rice accounts for the bulk of government purchases. It is not clear whether this increased demand for rice feeds into higher paddy prices or simply leads to higher profits at the milling stage. Even if paddy prices rise as a result, at least part of the gain goes to paddy traders, not farmers.

Equally important, while in theory farmers are entitled to sell directly to procurement centres, in practice they sell through traders and do not benefit directly from high procurement prices. Sales at local supply depots are bureaucratic and time-consuming. Before taking his paddy, the farmer must first visit the procurement centre to express his interest and co-ordinate the transaction; after selling the paddy, he must go to the bank to collect payment. These problems are sometimes aggravated by long distances to these centres. Finally, and most important, farmers' paddy is almost always rejected on quality or quantity grounds.

However, field evidence suggests that many farmers are aware of the requirements for selling to government procurement centres. The latter will not accept quantities below 70 kilograms and will only buy certain varieties. The paddy must be cured and moisture content should not exceed 14 percent. Although cases may exist when the paddy supplied does not meet such requirements, other factors seem more important in explaining why the great majority of farmers have no access to local supply depots (Awal and Brewin, 2001; Baulch *et al.*, 1998; Goodland *et al.*, forthcoming; Shahabuddin and Islam, 1999):

- First, it is easier for warehouse officials to collect large quantities of paddy from traders than to engage in multiple transactions with small farmers.

- Second, cases of so-called “musclemen” preventing farmers from reaching the centres and forcing farmers to sell to them instead have been reported.
- Last, but certainly not least, connections and unofficial payments are often necessary to guarantee access to procurement centres⁷.

2.8 The rice sector in Go-Interfish areas

Go-Interfish districts are located in Northwest Bangladesh, the main paddy growing region in the country. *Boro* is the main rice season. Paddy cultivation is characterised by high levels of input utilisation and a high proportion of total production is sold in the market, reflecting not only high production volumes but also larger than average farm size and lower than average population density. Approximately three-quarters of total paddy production in districts such as Dinajpur, Rangpur and Thakurgaon is marketed (Chowdhury, 1992). The area benefits from a dense network of paddy markets, the presence of a large number of paddy traders, and a very high concentration of rice mills.

A significant share of the paddy surplus generated by Go-Interfish districts is processed close to production areas, within the same district or in a neighbouring district. However, because available milling capacity is insufficient to absorb all marketed production, considerable volumes are channelled to distant mills. Although most of these mills are located in the southern districts of Rajshahi Division (e.g. Pabna, Natore, Naogaon and Bogra), many wholesalers have regular clients in the southern, central and south-eastern parts of the country.

Exports to outside areas are even more prevalent and the average distance to destination market areas longer in the case of rice marketing, as local production is well above local requirements. The main cities and industrial areas of the country predominate as terminal markets. For example, Dhaka, Narsingdi, Noakhali, Jessore, Khulna and Chittagong are common destinations to the rice produced in Go-Interfish districts. While small local mills may sell large quantities to nearby traders, larger mills rely essentially on distant market outlets. The dominant position of the Northwest region as the main rice supplier to deficit areas has been further strengthened following the opening of the Jamuna bridge in 1998.

2.9 Paddy markets

The literature on paddy marketing (e.g. Chowdhury, 1992) classifies markets into primary and secondary:

- Primary markets serve different villages and open on specific days of the week, usually twice. These markets serve as important collection points for the paddy produced in neighbouring areas. Many itinerant traders converge to primary markets to purchase

⁷ This is not surprising. While there are significant gains to be made from sales to government procurement centres, especially during the immediate post-harvest period, the relatively small quantities bought mean that only a few will be able to access this channel. Consequently, there is a clear incentive for market players to take advantage of their connections and offer side payments in exchange for the right to sell. In other words, in a situation of excess demand for a very lucrative and fixed-price market outlet, bribes and connections act as a rationing mechanism. In such a situation, farmers are at a clear disadvantage vis-à-vis traders

paddy from farmers. The product is normally conveyed in very small quantities by head load, bicycle, rickshaw van, bullock-cart and power trolley. Some mills may also procure paddy in these markets.

- Secondary markets act as assembly points for paddy first channelled to primary markets. Depending on the quantity, paddy is either brought in by intermediate means of transport or conveyed in trucks. Farmers also come to these markets to sell. Secondary markets are often open six days of the week and accommodate a large number of wholesalers. It is from these markets that most local and distant mills procure paddy, and supplies are normally transported from the market by truck.

This study does not rigidly follow the above market categorisation. During fieldwork, it was found that the distinction between primary and secondary markets is not always that clear. It is true that markets differ considerably in size, number of traders and area of influence. However, the functions performed are often the same. More specifically, many so-called primary markets act as important supplying outlets to mills, even though these tend to be small in size and located in nearby areas. Furthermore, like secondary markets, they may also accommodate traders that perform the function of wholesaler and commission agent.

2.10 Marketing options

Most Go-Interfish project participants engage in paddy sales, even if many have to buy rice later on in the season to satisfy the household's consumption needs. According to project survey data (CARE, 2001), the average Go-Interfish household markets approximately one-third of the total paddy harvest. Marketed quantities average 4 and 6.5 maunds⁸ during the *aman* and *boro* seasons, respectively. More paddy is produced in the *boro* season, and this explains the difference in marketed volumes between seasons. As mentioned, women are not involved in the actual selling of paddy, even when the produce is sold at the homestead to an itinerant trader.

Go-Interfish farmers have a variety of marketing options to choose from within relatively short distance from their village. They can sell at the farm gate, take their paddy to nearby rural periodic markets or sell at one of the several mills operating in their area:

- Farm-gate sales are convenient in that no time is spent and no transport cost incurred taking the product to the buyer. Moreover, farm-gate prices are only slightly lower than prices at the market place or mill gate and prompt payment is common. Unsurprisingly, as many as 70 percent of the paddy producing households in high production districts such as those located in Go-Interfish areas sell at the farm-gate (Chowdhury, 1992).
- When buyers are not available at the farm-gate, the farmer faces no problem in selling at primary or secondary markets, where large numbers of buyers can be found, especially during the peak *aman* and *boro* marketing seasons. Most villages are located within 10 kilometres or less from a paddy market. The grain is normally sold for cash and the farmer may take this opportunity to purchase a variety of goods at the market.

⁸ One maund equals approximately 37.5 kilograms.

- Selling at the mill is another option available to farmers. Most mills buy at the mill-gate from farmers and itinerant traders. While some millers are willing to purchase any quantities brought to them, others find it time consuming to deal with minimal quantities from a large number of suppliers and therefore will not accept less than a 5 or 10 maunds from each seller. Moreover, purchases on credit are common, and this discourages many farmers from taking their paddy to the mill, even if they are entitled to a higher future price. Mills also tend to apply stricter quality criteria than traders when buying paddy.

Although Go-Interfish farmers sell small quantities of paddy, this does not seem to significantly affect the price they receive. One of the surprising findings from the fieldwork was that the price fetched by producers is basically the same irrespectively of the quantities sold, which is a strong indication that paddy markets are highly efficient. For example, an itinerant trader will generally pay the same farm-gate price for one, 10 or 20 maunds of paddy. One rickshaw van has the capacity to carry between 10 and 14 maunds, and if this is the means of transport used, the trader will want to buy that same quantity in a village so as to minimise his average transport costs and save time. If he cannot obtain 10 maunds from one grower, he will normally have no problem in procuring the remainder from a neighbouring producer. Because the trader will face very few additional transaction costs in so doing, poor farmers will not be penalised in terms of price.

Likewise, small and large farmers will be paid similar prices in primary or secondary markets provided the variety and quality of the grain are the same. In a market day traders handle such large volumes and buy from so many different sources that they cannot afford to discriminate against particular suppliers based on the quantities brought to them. They are more concerned with the quality than the quantity of the grain bought from individual farmers. Similarly, mill-gate purchasing prices are essentially set according to variety and quality criteria, not the quantity of paddy supplied.

However, poor farmers may be somewhat constrained in their choice of buyer and market outlet due to the small quantities traded. While they face no problems in selling to small itinerant traders at the farm gate or to any other trader at the paddy market, they are generally unable to attract wholesalers and millers to the village. These market operators will not come or send their workers to the village unless the quantities justify it. Likewise, in many cases farmers may not be able to sell marginal quantities of paddy at the mill gate.

Despite these limitations, during the interviews no farmer referred to lack of buyers as a problem. Equally important, farmers who are unable to sell directly to mills or large traders at the village do not seem to loose out significantly in terms of price. Different categories of buyers pay very similar spot prices. In a given village, the difference between the price paid by small itinerant traders and that offered by large traders or millers may well be the same and rarely exceeds 2.5 percent. In a particular area, millers may sometimes pay slightly higher prices at the mill gate than traders at nearby primary or secondary markets, but in other occasions the inverse may happen.

In sum, and contrary to what one would expect, Go-Interfish farmers are not significantly penalised by only having small quantities of paddy to sell. They do not lack buyers and the prices received are similar to those fetched by large farmers. The situation is such that there is no single market channel or buyer which has proven clearly superior to others with respect to prices offered. Paddy markets are well developed and competitive.

2.11 Market players and marketing chains

Four main categories of participants dominate paddy marketing in Go-Interfish areas. Their activities, functions and relations with other market players can be briefly described as follows:

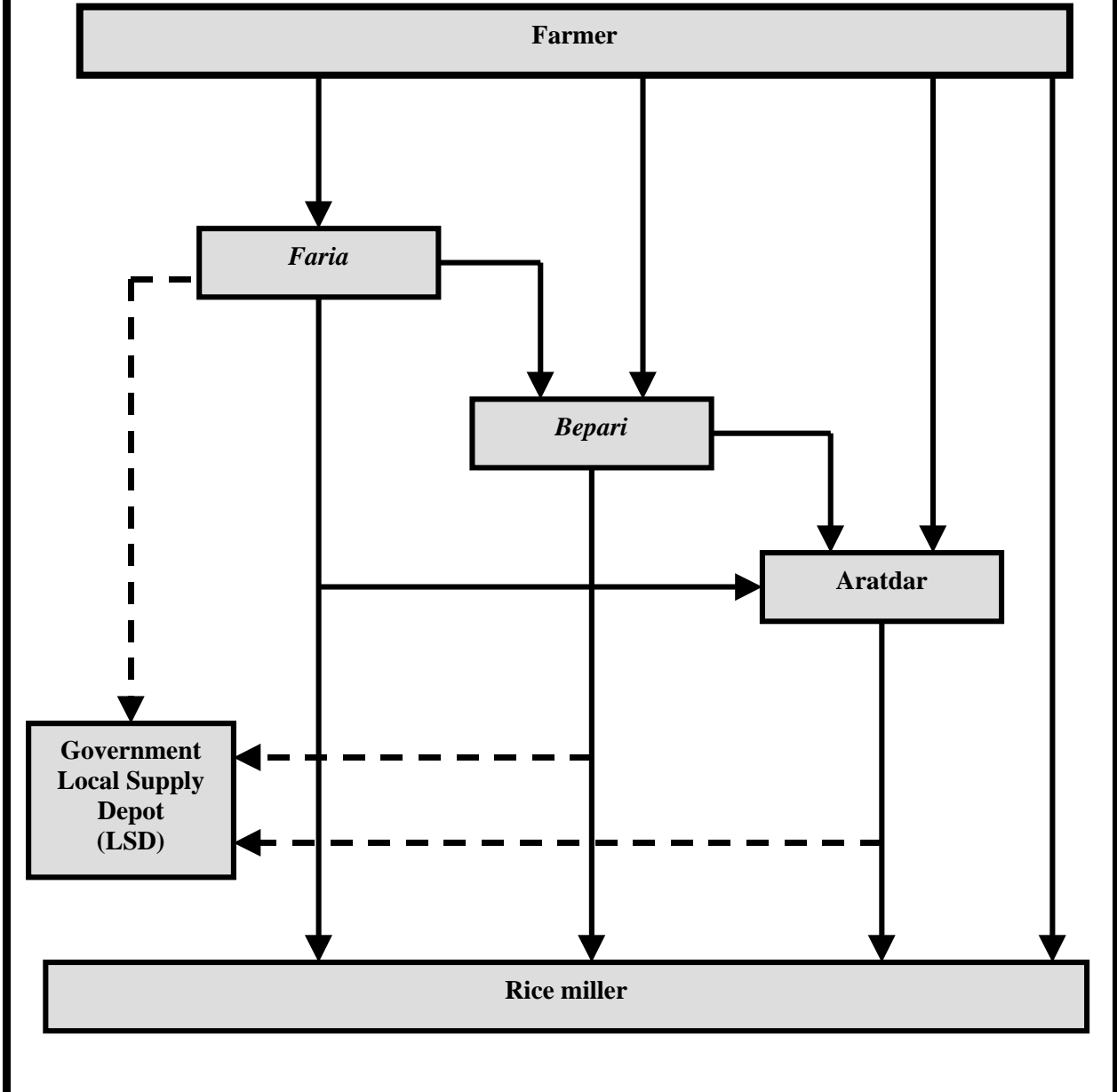
- Small-scale itinerant traders (*faria*). During the marketing season, *faria* go from village to village to procure paddy from farmers for subsequent sale to wholesalers and millers. They also purchase paddy from farmers at primary or secondary markets, selling to wholesalers and millers at the market or taking the produce to other nearby markets and mills. *Faria* either use their own bicycles to transport the paddy or rent rickshaw vans, power trolleys and bull carts. They rarely use hired labour, have no fixed premises, operate in relatively circumscribed areas, and deal with small product quantities. Volumes purchased from each farmer typically vary between one and 10 maunds and they rarely handle more than 20 or 25 maunds per day.
- Large itinerant trader (*bepari*). *Beparies* buy at primary markets from farmers and *faria*. They also buy at villages but seldom procure less than 5 maunds from individual farmers. Normal quantities traded during market days normally vary between 50 and 250 maunds. *Beparies* sell to wholesalers as well as nearby and distant mills, often acting as their agents and receiving a fixed commission as payment. Cash advances from clients are common. While small *beparies* are in many ways similar to *farias*, the larger ones resemble wholesalers in their functions and access to capital and transport. They may own or rent small premises in the market, where the paddy is collected before being loaded into rented trucks. They rarely undertake storage for more than a few days. Paddy marketing tends to be their main source of income.
- Wholesaler (*aratdar*). *Aratdars* assemble large quantities of product from dispersed growers, *faria* and *beparies* for sale to mills. *Aratdars* normally operate at large marketing centres, where they hold fixed storage premises, but also undertake purchases from large farmers at the village level. They sometimes engage in temporal price arbitrage through storage, but do not tend to retain stocks for than a few days or weeks. Wholesalers often procure paddy on behalf of mills, from whom they receive funds and orders, being paid a fixed commission. Large *aratdar* buy as much as 400 or 500 maunds of paddy per market day and tend to operate in a wider geographical area than *beparies* with respect to client location. They hire several workers, who are responsible for carrying out purchases at the farm-gate and markets and undertaking a variety of operations, including unloading, inspection of product quality, weighing, sorting, bagging and loading.
- Millers. Mills vary in terms of ownership as well as milling and storage capacity. Some mills are owned by the operator whereas others are leased. Only those with adequate storage capacity and access to working capital are able to operate all year round. Mills buy at the farm gate, mill gate and paddy markets. While small mills can satisfy their daily requirements from nearby markets, the larger ones have to rely on more distant sources. Transport may be organised by supplying *aratdars* and *beparies* or by the miller. The rice is then sold to local and distant rice wholesalers.

In addition to these players, three other less important market participants are worth mentioning:

- *Kutials*. These are small-scale, seasonal and often part-time home-based village processors. They purchase paddy from farmers in neighbouring villages and markets, undertake parboiling and drying operations using household labour, and custom mill the paddy at a local rice or husking mill. The rice is then sold to market wholesalers or retailers.
- Crushers. These itinerant traders also operate simultaneously in paddy and rice markets. They purchase paddy from farmers and *faria* for custom processing at mills, retaining the rice for sale at wholesale markets. They are larger in scale than *kutials*.
- Government. The government absorbs a relatively small proportion of total paddy production. However, because of the favourable procurement prices, the contentious nature of access to public procurement centres, and the uncertain impact of the system on paddy and rice markets, the government is often the focus of much attention and debate. As already mentioned, farmers rarely have access to government procurement centres.

Figure 2.3 below represents the main paddy marketing chains in Go-Interfish areas.

Figure 2.3
Paddy Marketing Chains in Go-Interfish Areas



2.12 Marketing margins

Paddy marketing margins in Go-Interfish areas were found to be extremely low and the share of the mill-gate purchasing price captured by growers quite high, even when sales are carried out at the farm gate and two or more market intermediaries are involved in the product chain. Table 2.2 presents standard margins for different intermediaries in the paddy marketing chain during the time of the survey. These margins are calculated on the basis of prices at different stages of the product chain on a particular day. As an example, it is assumed that growers sell at the farm-gate to small itinerant traders, who then transport the paddy to a nearby market in

rickshaw van. At the market, itinerant traders sell to wholesalers, who collect large quantities of produce for distribution to local mills. Transport from the market to the mill is organised by the miller. This is a typical marketing chain in the study areas. While variations to this product channel can be introduced and alternative scenarios constructed, margin estimates and conclusions would remain largely unchanged.

Table 2.2 Marketing margins for boro paddy in Go-Interfish areas, June 2001

Tk per maund		
1. Farm-gate price		190
2. Itinerant trader's selling price to the wholesaler		195
3. Itinerant trader's marketing costs per maund		2
4. Wholesaler selling price to the mill		200
5. Wholesaler's marketing costs (e.g. labour)		2.5
6. Itinerant trader's gross margin	(2) – (1)	5 (2.6%)
7. Itinerant trader's net margin	(2) – (1) – (3)	3 (1.5%)
8. Wholesaler's gross margin	(4) – (2)	5 (2.5%)
9. Wholesaler's net margin	(4) – (2) – (5)	2.5 (1.25%)
10. Farmer's share of mill-gate price	(1) / (4)	95%

Source: Field survey, June 2000

Traders typically operate with a gross margin of 5-10 Tk per maund. Such low margins have to cover unit operational costs and still generate a profit. Securing high business volumes is therefore critical for reducing unit marketing costs and increasing revenues. The main marketing costs for larger itinerant traders are transport and labour. Although smaller itinerant traders generally do not hire any labour and may even save on transport by carrying the paddy on their own bicycle, they trade much lower quantities and therefore enjoy very small profits. Wholesalers hire several workers and may have to pay for transport from the farm-gate to the market and from the market to the mill. Workers are involved in activities such as the collection of paddy from villages, checking quality, weighing, unloading the product, bagging, and loading it in trucks. Other wholesale marketing costs include market fees, warehouse rent, electricity, phone bills, jute bag purchases and entertainment expenditures.

Estimated margins may be particularly depressed because of the fact that field work was conducted in May and June, during the peak *boro* marketing season, when market supplies are abundant and prices low. Also, margins are much higher in sales to government procurement centres, although the importance of this market outlet is marginal and declining. These considerations notwithstanding, the findings are robust enough to conclude that paddy marketing systems in the study areas are characterised by intense competition and operate in a fairly integrated and efficient manner. Paddy collection and distribution costs are small in relation to the mill-gate purchasing price and profit margins very low. Farmers generally command a high and fair share of the mill-gate purchasing price.

These findings are corroborated by other, more in-depth studies. For example, in their analysis of the spatial integration and price efficiency of the private sector grain trade, Baulch

et al. (1998) arrive at very similar estimates for *boro* coarse paddy in Naogoan and Sherpur districts as those presented above.

Some may argue that, despite intense market competition, poor farmers are often tied to informal credit providers, to whom they must sell their paddy at very low and unfair prices. It is true that cases exist when small and marginal farmers receive pre-harvest credit from informal moneylenders (*mahajan*) or traders, with the loan being repaid in predetermined paddy quantities to be delivered after harvest. Implicit prices are often set at well below market rates. However, these cases seem to be more an exception than the rule and apply mostly to low production areas (Chowdhury, 1992). This issue was explored during field discussions with Go-Interfish farmers, who indicated that although credit from *mahajan* was not uncommon, payment in kind rarely occurred. Indeed, one of the reasons why farmers sell immediately or soon after harvest is to earn much-needed income to repay previously contracted loans.

2.13 Key marketing problems and constraints

2.13.1 Problems and constraints faced by traders and millers

i. Low prices

Traders and millers are most concerned with low paddy and rice prices. This general concern is consistent with the low marketing and profit margins enjoyed in paddy trading. Prices are particularly depressed during the peak marketing season and when sudden and large quantities of Indian rice floods the market. The problem of low prices is also associated with the small and declining importance of government purchases. During discussions, both traders and millers expressed discontent over the modest volumes of paddy and rice channelled through the government procurement system, and an increase in these flows is often seen as the easiest solution to many of their problems. Many also complained about lack of access to government outlets because of the need to have good contacts with, and offer side payments to, local supply depot officials.

ii. Lack of own capital and difficult access to credit

During the interviews, many traders and millers mentioned shortage of own capital and difficulties in access to formal lending institutions as important constraints to the development of their activities. Traders and millers may operate in areas with no bank branches and often complain about corruption amongst bank officials in sanctioning credit. Both traders and millers depend to a various extent on their own funds to undertake investments in milling or storage capacity and carry out paddy purchases, and insufficient working capital constrains the amount of product they are able to trade or process, especially during the peak marketing season.

Cash shortages and inadequate access to institutional credit partly explain why traders try to maximise business turnover and avoid keeping stocks for long⁹. These factors also help explaining why many mills close for part of the year. Millers not only must procure most of

⁹ Additional reasons for low storage activities includes the risk of unforeseen adverse price fluctuations, the cost of storage in terms of rent and interest on capital, the need to maximise business volumes in the context of low marketing margins and the risk of product losses during storage.

their raw material requirements over a short two or three month period each season, but at the same time they must endure a time lag between paddy purchases and rice sales.

In view of liquidity constraints at the trading and milling levels, it is not surprising to see widespread informal credit arrangements between different market operators along the product chain (Baulch, 1998; Chowdhury, 1992; Goodland *et al.*, forthcoming). Credit flows both ways along different tiers of the marketing chain and the same operator may simultaneously be a credit provider and a credit receiver. Trust and repeated business transactions are intrinsic features of these informal credit arrangements, as the lender has no possibility of recovering funds through legal action in case of default. Even so, late payment is sometimes seen as a problem by market participants.

For example:

- Millers often provide short-term cash advances to wholesalers to purchase paddy, deducting these funds from the proceeds when wholesalers sell them the paddy. Short-term trade credit is usually provided free of interest, the rationale being to secure regular supplies.
- At the same time, deferred and partial payment by mills is common. Future payments are determined according to a previously agreed price or the spot price at the time. The supplier benefits from such arrangement by having his paddy stored by the miller on his behalf and by minimising the transaction costs involved in finding buyers and engaging in multiple selling transactions.
- Finally, while wholesalers may provide cash advances to smaller traders, they may also buy on credit from better-off farmers, with the future price being agreed beforehand or according to the market price at the time of payment.

The working capital shortages faced by individual market operators at various tiers of the product chain are not necessarily an indication that the system suffers from an acute liquidity constraint. The marketing system is able to absorb paddy marketable surpluses in a rather quick and efficient manner. By limiting the volumes handled by individual market participants and constraining their capacity to expand, liquidity problems may end up facilitating market entry and contributing to increased competition (Goodland *et al.*, forthcoming).

Still, from a farmer viewpoint, improved access to credit by traders and millers could be advantageous in that it would facilitate increased storage activities. Off-farm private storage activities are important to growers since they translate into higher paddy demand and prices during the peak marketing season, when selling is most intense, and greater supplies and lower prices of rice during the slack season, when many have to purchase rice.

2.13.2 Problems and constraints faced by Go-Interfish farmers

i. Low prices

The low price of paddy was mentioned as the number one problem in every group discussion with Go-Interfish farmers. This problem was felt as especially acute during the time of the

fieldwork, which coincided with a bumper *boro* harvest and very depressed paddy prices. When asked to elaborate why prices are generally low, farmers invariably referred to the need to sell immediately or shortly after harvest due to pressing cash needs. They not only face urgent consumption and production expenditures but must also repay previously contracted loans. Immediate paddy sales may also be motivated by lack of storage space or the risk of product losses during storage due to pests and dehydration. However, throughout field discussions, no farmer mentioned these as important reasons for undertaking sales during peak marketing periods. Goodland *et al.* (forthcoming) reached similar conclusions in their research on paddy marketing and rural livelihoods in three districts of Bangladesh.

As discussed in section 2.6, it is precisely at the time of harvest that paddy prices are at their lowest levels. The problem of selling right at the beginning of the marketing season is compounded by the fact that many deficit and non-deficit Go-Interfish households need to buy rice later during the season, when prices are higher. Recent NRI research found this same selling and purchasing pattern amongst small-scale farmers in other parts of Bangladesh (Goodland *et al.*, forthcoming).

Low prices are seen as particularly problematic because of the input requirements of paddy growing. Input use has significantly expanded over the past decades, following the introduction of green revolution technologies. Every year farmers have to purchase high-yielding seed varieties, buy fertilisers and pesticides, pay for water and fuel, and hire labour for planting and harvesting. At the same time, there is evidence that farmers are applying increasing doses of fertiliser just to maintain land productivity (Brandon, 1998). Not surprisingly, many interviewed farmers mentioned the high cost of inputs as one of their main problems.

ii. Low profitability

The combination of poor paddy prices and high input costs results in low profits. This problem seems most acute amongst poorer farmers, who are more exposed to depressed prices and high interest charges on consumption and production loans. Large farmers are able to postpone sales until moments of higher prices and may have at times access to cheaper bank loans. In contrast, poor farmers often undertake distress sales during periods of low prices and may face exorbitant interest rate charges from informal moneylenders.

As a result, many poor and marginal farming households find themselves trapped in a vicious debt cycle. They need to borrow money to purchase inputs and carry out consumption expenditures, repaying capital and interest after harvest. Being left with insufficient income to meet their consumption and production expenditures, they must again borrow money. In the process, they are unable to accumulate sufficient capital and escape poverty. Credit is an absolutely critical ingredient in poor farmers' livelihood and coping strategies but not necessarily a way out of poverty.

Interestingly, while many interviewed farmers complained about the low profitability of paddy cultivation, nearly all mentioned rice as their favourite crop. Rice is not only the staple food of Bangladeshi households but also the easiest and less risky crop to market. These factors largely explain why farmers have not diversified in any significant manner into more lucrative crops, such as vegetables and fruits (Ateng, 1998; Mahmud *et al.*, 2000).

iii. Lack of access to government procurement centres

Another very common complaint of Go-Interfish farmers relates to their incapacity to access government procurement centres. The reasons for this were discussed in section 2.7. In some villages visited, a few farmers have, in the past, tried to sell their paddy to the local supply depot but with no success. Not one single farmer interviewed has ever managed to sell to government procurement centres. These findings are consistent with the evidence collected from other studies (Goodland *et al.*, forthcoming) and fieldwork conducted by Go-Interfish staff (Awal and Brewin, 2001).

Lack of access to government outlets is a source of frustration to farmers for two reasons. One is that farmers perceive the system as unfair and inequitable and feel powerless to change the situation. For them, it is another example of discrimination. A second, and possibly more important, reason why the current system generates frustration amongst farmers has to do with the significant differences between procurement prices and market rates. For example, at the time of the fieldwork, the price of one maund in different locations and markets varied between 160 Tk and 200 Tk. The same quantity of paddy was being purchased by the government for 320 Tk. Consequently, farmers tend to see public procurement as an ideal but unattainable solution to the low prices they receive for their paddy. What many may not realise is that the government buys only a very small proportion of total annual production. Therefore, even if they were to enjoy fair access to the public procurement system, only a few would be able to benefit and most likely the quantities sold would be rather small.

2.14 Opportunities for intervention

2.14.1 Preliminary considerations

It is not easy to recommend paddy marketing interventions in the context of Bangladesh. Paddy markets are very well developed and largely efficient. Access to markets and buyers is not a problem. Farmers are well exposed to paddy marketing and do not seem to face serious difficulties in accessing market information or existing market channels. Product losses due to storage are relatively marginal. Spot prices paid to small and large farmers are very similar. Consequently, opportunities for clear gains to be exploited through project interventions were not identified.

Still, there are two areas for intervention that could potentially generate tangible benefits to project participants. Inventory credit to enable farmers to exploit seasonal price variations is one. The other is the promotion of farmers' access to government procurement centres and advocacy work to reform the procurement system.

2.14.2 Inventory credit

Lack of access to credit on favourable terms is frequently regarded as the main reason why so many farmers engage in distress sales. If poor and marginal farmers had adequate access to credit at moderate interest rates, they could meet their expenditure requirements without having to sell the paddy. They could then repay the loan three or four months later with income earned from different sources, including paddy sales at higher market prices.

The difference between the trough and peak of the paddy price curve within one season varies from year to year and from region to region. Generally speaking, in high production areas such as those in Northwest Bangladesh, intra-seasonal price fluctuations for paddy are on average between 10 and 20 percent. Care must be taken, however, not to equate maximum intra-seasonal price differences with the actual gain to be made from an intervention which provides credit to farmers, enabling them to engage in temporal price arbitrage.

Only those farmers that would sell at the bottom of the price curve in a scenario where credit is not available, and at the peak of that curve in a scenario where credit is provided, would capture the whole price difference. This is an unlikely scenario. In a real world situation, characterised by uncertainties and imperfect information, a farmer does not know exactly when prices will peak and is rarely in a position, therefore, to exploit price differences to the maximum possible extent. For example, sudden imports of rice or release of public stocks could frustrate price expectations¹⁰. The analysis is further complicated by the fact that, over time, paddy dehydrates and loses weight. One maund today will weigh less than 37.5 kilograms in two or three months time. Small product losses due to pests may also occur. Finally, and very important, the costs of storage and capital repayment must be brought into the equation.

The above analysis suggests that Go-Interfish and its partner organisations should follow a cautious approach to credit initiatives. These interventions are complex and costly. At the same time, their benefits may not be as high as sometimes thought and the risk of financial loss is real. However, because access to credit on favourable terms may facilitate delayed paddy sales and provide improved income opportunities to farmers, the project should contemplate the possibility of linking farmers with on-going government and non-governmental credit initiatives.

The SHOGORIP inventory credit scheme run by the Department of Agricultural Marketing (DAM) at the Ministry of Agriculture is one such example (DAM, 2001). Inventory or warehouse credit schemes have the potential to address credit access problems. This concept has been implemented in several developing countries. Such initiatives have usually targeted traders and processors, but cases exist where small farmers are the direct target beneficiaries, such as in Ghana and Bangladesh (Coulter and Shepherd, 1995).

In this scheme, participating farmers bring their grain to project warehouses, where it is checked for moisture, cleanliness and insects. If the grain is of acceptable quality, the farmer is given a receipt indicating the quantity of grain stored, which serves as loan collateral. The farmer retains ownership over the deposited grain, being entitled to a loan from a participating bank at a fixed rate of 80-90 percent of the government procurement price. The farmer can withdraw the deposited grain from the warehouse at any time, paying back the loan and interest to the bank and a storage fee to the Godown Committee.

SHOGORIP targets farmers owning less than 5 acres of land. Each farmer can store up to 10 quintals of grain per harvest¹¹. One project staff is in charge of the warehouse for the first 18 months, after which a Godown Committee of 7 members, elected by farmers and assisted by an Advisory Committee, is supposed to take over. At present, a total of 71 warehouses are in operation, many of which in Go-Interfish areas, servicing approximately 60,000 registered

¹⁰ The likelihood of unexpected price changes seems to have increased after the liberalisation of rice imports.

¹¹ One quintal equals 100 kilograms.

farmers. SHOGORIP expects to have 116 warehouses with a total capacity of 10,000 tonnes and 100,000 farmers enrolled in the scheme by June 2002.

Apart from increased income from crop sales, farmers are expected to benefit from access to quality seed, the opportunity to access financial institutions, increased understanding of market price fluctuations, and enhanced social status. Only six warehouses are currently under farmer management. According to project officials, the operation of these warehouses has not encountered serious problems during the post-support phase. Loan recovery is close to 100 percent, but loans may at times have to be rescheduled to accommodate situations in which farmers face repayment difficulties due to unforeseen price fluctuations. Although it is probably too early to arrive at definite conclusions regarding the success of the scheme, CARE should develop links with DAM and the project with a view to judge the appropriateness of facilitating the participation of Go-Interfish farmers.

2.14.3 Promoting access to government procurement centres

Market operators that manage to sell at government procurement centres are able to capture very attractive prices. Go-Interfish farmers would reap significant benefits if they were able to access these outlets. They would also benefit if the system worked in such a way that its impact on farm-gate prices would be taken more into account. Consequently, CARE should consider possible strategies to enhance farmers' access to procurement centres and improve the design and operation of the system. In so doing, it should be aware that this is a highly sensitive issue. It should also bear in mind that interventions in this area may be complicated by the fact that local supply depots procure a very small proportion of the total paddy harvest and as a result, only few Go-Interfish farmers may benefit from improved access. Targeting of beneficiaries may be a difficult and contentious matter.

Three possible intervention options are elaborated below:

1. Link farmers to procurement centres. In order to overcome the problem of farmers individually marketing small quantities of paddy, which seems to be one of the alleged reasons for procurement officials to give preference to traders, CARE could organise farmers in groups for the sole purpose of selling at these centres. Groups would also have the advantage of reducing the transaction costs associated with dealing with the formalities of selling at local supply depots since only a few of the group members would need to be involved in each step of the operation. Given the potentially high gains of selling at procurement centres, group dynamics should not pose major problems¹².

Groups alone are far from sufficient to guarantee farmer access to government procurement channels. Concurrently, in order to prevent staff excuses for refusing to buy farmers' produce, CARE should not only provide project participants with accurate information about procurement times and requirements in terms of quality and variety types, but also offer them the required assistance for accurate weighing and moisture and cleanliness assessment. In addition, the project should liaise with godown officials, serving as broker between them and project participants. The idea would be to enhance

¹² Some of the problems associated with group formation and development for marketing activities are discussed in chapters three and four.

the awareness of government officials to the needs of project farmers, and in so doing, increase their willingness to buy directly from growers.

2. Market on behalf of farmers. A second possibility in case linkage development proves unfeasible, would be for CARE or its partner organisations to undertake sales to procurement centres on behalf of farmers. This is a more interventionist approach than the previous one, as the NGO would be directly responsible for sorting and assembling the paddy and transporting it to the local supply depot. Payment would then need to be collected from the bank and distributed amongst participating farmers. The NGO could either be issued slips by procurement centres, under the understanding that it would purchase paddy from farmers, or collect slips previously distributed to farmers.
3. Lobby for an improvement of the system. There is scope to improve the system in order to enhance its impact on farmer prices. Therefore, CARE could consider developing advocacy activities aimed at changing the way the procurement system works. Clearly, CARE alone cannot achieve much. For this reason, it should join forces with other NGOs and stakeholders for policy dialogue with the Ministry of Food and relevant government institutions. Discussions with IFPRI project staff within the Ministry of Food could provide useful inputs on how to best approach the whole issue.

Advocacy and policy lobbying should be preceded by pragmatic analysis and strategic thinking on which issues to focus. Section 2.7 suggests some that could form part of a reform agenda. First, procurement time should be anticipated to coincide with the paddy harvest and the period of procurement shortened from the current three months to one or one and a half months. Second, the current predominance of rice in government purchases should be reversed in favour of paddy. Third, the differential between procurement and market prices should be reduced to reduce the current incentives for corruption. Fourth, ways should be found to effectively enhance the participation of small and marginal farmers in the system.

CHAPTER THREE

FISH MARKETING SYSTEMS IN NORTHWEST BANGLADESH

3.1 Introduction

Little has been written on fish marketing in Bangladesh and even less on the specific case of Go-Interfish districts, which occupy a relatively marginal position compared to other fish producing areas. However, because Go-Interfish districts are not major fish producing areas, local producers enjoy favourable market opportunities and prospects. This chapter looks at possible ways in which Go-Interfish farmers can be supported to better exploit existing market opportunities. The focus of the analysis is on fresh fish. Dried fish is consumed in Go-Interfish areas but in small quantities.

3.2 Fish production in Bangladesh

Bangladesh is endowed with a long coastline and vast inland water areas, comprising rivers, tributaries, canals, large lakes, oxbow lakes (baors), land depressions (haors), ponds, inundated paddy fields, floodplains and estuaries. Marine fish production is concentrated in coastal areas of Khulna, Barisal and Chittagong divisions. Inland fish resources are spread throughout the whole country. Half of the area under rivers and estuaries lies in the Southwest region; half of the area under baors is in Jessore; the largest lake (Kaptai Lake) is located in Chittagong; and the largest flooding basin is in the Northeast. Beels (small land depressions that hold water permanently or seasonally) and ponds are evenly distributed throughout the country.

Bangladesh waters are inhabited by 475 marine and 271 inland water fin fish species. Of these, 42 marine and 37 inland water species are exploited on a commercial scale (Rahman, 1997). Ilish is by far the most popular and widely available fish. Although a marine specie, it is caught in large numbers when it migrates up river for spawning. Major carps (e.g. rui, catla and mrigal), other carps and catfishes (e.g. boal, pangas and rita) are highly valued freshwater species. Apart from indigenous species, some exotic fish has been introduced in Bangladesh since the 1970s, including silver carp, grass carp, common carp, pangas and tilapia. Common carp and tilapia have established themselves in the inland open waters of Bangladesh.

Fish production in Bangladesh is seasonal. This is largely a consequence of the fact that inland fisheries are intimately linked to fish migratory flows, reproduction and growth patterns, and river flooding dynamics (Ali, 1997; Minkin *et al.*, 1997; Payne, 1997). During the pre-monsoon season, upstream spawning migration of major riverine species takes place. Following the onset of the first heavy rains, between May and June, river waters overflow their banks and flood extensive areas of the low-lying lands. It is at this time that young and mature fish begins to migrate from rivers and beels to floodplains through canals for reproduction and feeding. A large number of people then become involved in fishing activities as part-time and subsistence fishermen.

Between May and July, migrating fish are caught in canals and floodplains. In the following months, the fish population increases dramatically, harvesting in the floodplains gains prominence, and catching volumes expand. When the floodplain waters recede, from

September to December, fish migrate back to rivers or take refuge in perennial water bodies, being caught in large numbers. Inland fishing then becomes restricted to rivers and permanent water bodies such as beels and ponds. Initially, beels are well stocked, but intensive harvesting leads to a depletion of fish resources, and a scarcity period of approximately four months (late March- early July) follows until the onset of the next monsoon season.

Despite the significant expansion of marine fisheries since the 1970s, inland water bodies remain by far the most important source of domestic fish supplies (Table 3.1). By the mid-1990s inland fisheries accounted for more than three-quarters of annual fish production, which in 1994-5 was estimated at 1.2 million metric tonnes¹³. Flood lands contributed 30 percent of the total catch, followed in order of importance by ponds, marine waters, rivers and estuaries, land depressions (beels and haor) and rice fields.

Between 1984-5 and 1994-5 fish production expanded by 55 percent, above the population growth rate over the same time period (Table 3.1). Pond fish farming and marine artisanal catches were responsible for much of the increase in production. In contrast, inland capture fisheries as a whole have shown a stagnating trend. River fish catches have been declining year after year, and while floodplain fish output has recovered in the early 1990s, it contracted during the two previous decades. Because recent statistics were not consulted, it is not possible to ascertain whether these trends have continued during the second half of the 1990s.

Past declines in riverine and floodplain fish production were a consequence of several natural and man-related factors (Ali, 1997; Tsai and Ali, 1997). Shoaling, siltation and changes in river courses have negatively affected riverine production. In addition, flood areas have been reduced, migratory patterns disturbed, and floodplain habitats disrupted by factors such as flood control and drainage measures, the development of irrigated and high-input rice production, rural road construction, increased population pressure, and over-fishing.

Many authors have raised concerns regarding the declining trend in inland capture fish production in general and floodplain catches in particular (Ahmed, 1997; Ali, 1997; Minkin *et al.*, 1997). During the rainy season, between July and October, floodplains are inhabited by a wide variety of large and small species, providing a critical source of proteins to the population, particularly the poorest of the poor, who cannot afford to buy fish in the market on a regular basis. Apart from professional and part-time fishermen, a large number of men, women and children living in and around floodplains engages in subsistence fish capture activities. Small indigenous species are particularly important to the poor. Apart from household consumption, part of the fish harvested may be given away as gift or used in special occasions such as weddings and religious festivities. Some may also be sold to meet the household's cash needs. Fish selling activities are invariably carried out by men.

¹³ The DoF publishes annual fish catch statistics. Unfortunately, the consultant did not have access to the more recent bulletins, and for this reason 1994-5 figures are used.

Table 3.1 Fish Production in Bangladesh (metric tonnes), 1984-1995

	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94*	1994-95*
Inland Waters											
a) Capture											
1) River & Estuary	213,057	199,500	195,117	183,317	181,140	173,410	135,355	124,843	138,746	130,235	135,550
2) Sundarban	5,825	7,112	6,035	3,055	6,416	5,393	6,651	6,297	6,939	6,970	7,550
3) Depression (beels and haor)	45,893	45,258	42,077	45,610	47,019	46,594	47,923	49,201	53,019	56,678	62,550
4) Kaptai Lake	2,700	2,433	3,991	4,068	3,439	3,713	4,392	4,216	4,142	4,815	5,500
5) Flood Land	194,130	187,396	183,795	182,037	186,126	193,762	249,083	295,185	329,573	353,530	365,500
Sub-total	461,605	441,699	431,015	418,087	424,140	422,872	443,404	479,742	532,419	552,228	576,650
b) Culture											
1) Pond	111,557	123,804	142,876	148,423	155,012	153,730	131,018	195,034	202,167	231,530	285,520
2) Ox-bow Lake (<i>baors</i>)	962	968	1,174	1,254	1,321	1,357	1,544	1,682	1,803	2,250	3,550
3) Farm	11,232	19,951	22,050	25,248	27,172	27,505	28,431	30,147	33,773	41,500	56,630
Sub-total	123,811	144,723	166,100	175,925	183,505	192,592	210,993	226,863	237,743	275,280	345,700
Inland Total	585,416	586,422	597,115	594,012	607,645	615,464	654,397	706,605	770,162	827,508	922,350
Marine Fisheries											
a) Industrial	12,440	11,898	12,356	10,395	10,353	11,379	8,760	9,623	12,227	14,600	17,530
b) Artisanal	175,123	195,503	205,223	217,187	222,928	227,534	232,778	235,851	238,265	245,000	260,350
Marine Total	187,563	207,401	217,579	227,582	233,281	238,913	241,538	245,474	250,492	259,600	277,880
Total Fish Production	772,979	793,823	814,694	821,594	840,926	854,377	895,935	952,079	1,020,654	1,087,108	1,200,230

Source: Department of Fisheries, Bangladesh 19984-1994: Bulletins on Annual Fish Catch Statistics for the years 19984-85 to 1994-95, in Rahman (1997).

* Provisional

An expansion of culture-based fisheries has compensated for the decline in inland natural catches. Although ponds cover only 3.5 percent of total inland water bodies, they now contribute approximately 30 percent of total inland fish production. Fish polyculture involving a mix of native and exotic carp species is becoming an increasingly attractive economic activity as a result of favourable price trends and the dissemination of aquaculture technologies, and is seen by government and donors as a partial solution to diminishing inland capture fish resources. However, such developments are not free from problems. In particular, it appears that Bangladesh is experiencing a shift in the composition of its fish portfolio, away from “poor people’s fish” and towards large-size, high-value native and exotic species (Lewis *et al.*, 1996).

Many authors have also expressed concern over the tendency for privatised user rights to replace traditional access systems following a policy of leasing water bodies to the highest bidders and the expansion of aquaculture activities (Ahmed, 1997; Ali, 1997; Lewis *et al.*, 1996; Minkin *et al.*, 1997). This represents a serious threat to the livelihoods of many poor people who rely on common property fisheries as a main source of proteins and/or income.

3.3 Fish consumption in Bangladesh

Fish is an integral part of Bangladeshis’ diet and the principal source of animal food to the population. Per capita fish consumption in Bangladesh is estimated at approximately 9 kilograms per annum, well below the Asian average of 25 kilograms (Minkin *et al.*, 1997; Rahman, 1997). Consumption is significantly higher in urban areas.

Inadequate purchasing power is one cause behind low overall consumption levels. Insufficient domestic production offers another, more important explanation. Fish consumption levels in Bangladesh are closely associated with domestic production volumes: in years of increased production, consumption rises; in years of declining output, the opposite happens. This close relationship between production and consumption levels is due to the marginal role of imports and exports¹⁴. Whilst domestic fish supplies are not threatened in any significant manner by exports to other countries, at the same time availability is not improved through imports from neighbouring or distant countries.

Fresh fish is highly perishable and must be consumed soon after harvest. It is true that fish can be stored over long periods through freezing and its shelf life significantly extended through salting, drying, smoking or canning. However, while freezing is expensive and not that common in Bangladesh, only a small proportion of the fish produced in the country undergoes processing.

Indeed, mainly as a result of consumer preferences, most fish is consumed in its fresh form. According to guess estimates made in the early 1990s (Rahman, 1997), 70 percent of total production was either consumed fresh or iced for medium to long distance transport within the country. Approximately 20 percent, consisting of small species, was sun dried or salted and dried. The remaining 10 percent were frozen, smoked, canned or mealed. Icing is particularly important in the case of marine fish, which tends to be transported over longer distances than freshwater fish, whose production is more evenly distributed throughout the

¹⁴ Still, shrimp exports from southern Bangladesh are the second most important source of foreign exchange earnings, after textiles and garments.

country. Ice is used by producers and traders when the fish is marketed more than 4 or 5 hours away from the point of production and for short-term storage purposes.

The seasonal character of inland fish supplies has important distributional consequences. During the dry season, common property fish resources decline drastically, and subsistence fishing opportunities are much restricted. Fish must then be bought in the market, precisely at a time when the composition of fish supplies is more biased towards larger species and prices are higher. While better-off households are able to maintain fish intake levels through regular market purchases, those without the purchasing power to do so are forced to cut fish consumption levels.

Fish demand is likely to continue expanding over the medium term as a result of population growth, rising per capita incomes and increased urbanisation. Yet, marine and inland fish catch volumes will remain the single most important determinant of future consumption levels. Unless production keeps pace with rising demand, the gap between the two will increase, prices will rise and consumption levels will remain repressed. This is not an unlikely scenario (Rahman, 1997).

3.4 The fisheries sector in Northwest Bangladesh

The Northwest of Bangladesh falls within the Rajshahi Division. The region is bordered by the Brahmaputra River in the East and by the Padma in the South, and crossed by many of their tributaries. These rivers have traditionally been a significant source of freshwater fish to the region, but their importance has been declining for some time. Presently, the bulk of fish catches originate from ponds, floodplains and beels.

As in the rest of the country, fish production is essentially a small-scale activity, conducted by professional and part-time fishermen using simple technologies. Large numbers of households also engage in subsistence fish harvesting activities in rivers, canals, flooded paddy farms, beels and ponds. Commercial pond fish culture is becoming more widespread (Lewis *et al.*, 1996).

Most fish in the region comes from the southern districts (e.g. Naogaon, Natore, Pabna and Rajshahi). Go-Interfish areas, located in the northern part of Rajshahi Division, are not particularly well endowed in terms of river networks and inland water bodies. Areas under beels and ponds are relatively small. A significant proportion of ponds and beels are seasonal, drying for a significant part of the year. Consequently, Go-Interfish project areas are relatively marginal from a fish production viewpoint and largely dependent on outside supplies. For example, in 1992, Greater Dinajpur and Greater Rangpur districts produced 30,770 tonnes of fish while in that same year consumption was estimated at 103,499 tonnes (ASYB, 1994). Therefore, local catches were enough to satisfy 30 percent only of local consumption. The remaining had to be imported from other parts of the country

Production in the Northwest region has fallen significantly during the 1980s, especially in rivers and beels, and by the early 1990s the whole region contributed only 10 percent of national fish catches (Ali, 1997). During that period, many carp habitats were destroyed due to embankments and heavy sedimentation in the main rivers crossing and bordering the region. Irrigation projects, flood control measures, and overfishing also played a role. The

construction of the Farrapa Dam in India was another important factor, causing a change in the water flow and hydrology of the entire Padma River basin.

3.5 Product flows

Markets for fish produced in the study areas of Northwest Bangladesh are very localised. The product is normally consumed within a radius of 40 kilometres from the point of catch, and quite often the distances to retail markets do not exceed five or ten kilometres. Generally speaking, the picture is one of many casual fish collectors, small and large pond operators, seasonal and permanent fishermen, and petty itinerant traders carrying small quantities of fresh produce to nearby rural and urban retail markets. For very short distances, the fish is conveyed by foot, bicycle or rickshaw. Rickshaw van, tempo (three wheeled automotive van), and bus are commonly used for longer distances. During transportation the fish is frequently carried in aluminium containers containing water or packed with banana leaves into bamboo baskets. As soon as it reaches the market, it is sold to consumers. In the case of town markets, it is also sold to fish traders coming from neighbouring village markets.

Three main factors explain the circumscribed nature of markets for locally harvested fish:

- First and most importantly, local production is far from sufficient to meet the population consumption needs; for this reason, producers face no major difficulties in selling in nearby markets at remunerative prices.
- Secondly, fresh fish is an extremely perishable product that must be consumed shortly after harvest, especially in view of Bangladesh's humid sub-tropical conditions and the inadequate transport and preservation systems available at village and town level. It is true that fish can be cheaply preserved for relatively long periods when dried or smoked, allowing for storage and easier marketing to more distant areas. However, drying is not common and smoking not practised in Go-Interfish areas due to household consumption preferences and the fact that producers or fishermen generally have small marketable quantities which can be easily sold in neighbouring areas immediately after harvest. The intense and unpleasant smell of dried fish also seems to make this an unpopular option amongst producers.
- Finally, collection and transport of small and scattered fish supplies is a time-consuming, difficult to co-ordinate and costly activity. Marketing local supplies in distant areas is therefore uneconomical.

To cover the gap between local demand and supply, large quantities of fish are imported from other parts of Bangladesh and brought by boat, bus, truck and/or train to the larger town markets. Many are the markets in the region which are supplied daily or weekly with freshwater and seawater fish from outside areas. The fish is normally packed with ice in wooden crates or aluminium containers. There are three main supplying regions: the southern districts of Rajshahi Division (e.g. Naogaon, Natore, Pabna and Rajshahi); Khulna and Barisal divisions in the South; and the coastal areas of Chittagong, in the Southeast.

Finally, it is important to stress that even if Go-Interfish areas were self-sufficient in fish production, there would still be some imports from other regions. Indeed, some highly

appreciated riverine and sea fish species (e.g. ilish, rita and rupsha) cannot be found in the region and have to be imported from other areas. Also, while demand patterns do not justify local dried fish production, many households appreciate this type of fish, providing an incentive for traders to import it from other parts of the country. Two specialised wholesale markets, one in Saidpur town and the other in Rangpur town, supply imported dried fish to village and town markets in the study areas.

3.6 Fish markets

Fish markets in Northwest Bangladesh can be distinguished by their size, opening days, and type and number of traders. For the purposes of this study, fish markets are classified into two main types:

- *Hat*. These markets can be found in many villages and unions. They are held biweekly and may open in the morning, afternoon or evening. Modest in size, these markets comprise a small number of fish retailers (*pikar*) and serve a relatively small population. Fishermen and farmers are also seen selling to consumers in the *hat*. Often, the variety of fish displayed in these markets, both in terms of size and number of species, is small. The great majority of villages are within three to four kilometre distance from a *hat*.
- *Bazaar*. All district capitals and thana towns contain at least one *bazaar*. These daily and relatively large markets can also be found in some union headquarters. Each *bazaar* comprises a separate fish market, where a large number of people gather to sell and buy a wide variety of fish. Fish trading usually takes place during the morning. Unlike the *hat*, in most of these markets the fish is sold to retailers (*pikar*) through an auctioning process organised by commission agents (*aratdar*). Few villages are further than 20 kilometres away from a *bazaar*.

In the larger *bazaars*, *aratdar* and *pikar* are organised in market associations, which operate separately. These are essentially welfare organisations, collecting contributions from members, which are then used in situations of need, such as disease or marriage of a daughter. Market associations also mediate conflicts amongst members and between *aratdar* and *pikar*.

Despite their many differences, smaller and larger fish markets are essentially retail outlets in the sense that the fish is sold in small quantities to consumers and institutional clients. However, town *bazaars* also act as wholesale points, since fish is sold through auction to rural market retailers. During the fieldwork only three fish wholesale markets were found: the Saidpur and Rangpur specialised dried fish markets and the Terminal Bus Fish Market in Rangpur. Unlike the latter, which essentially supplies neighbouring villages in the district, the former two serve *hat* and *bazaar* markets which can be located more than 50 kilometres distant.

3.7 Market channels and players

This section describes the different fish marketing chains in Go-Interfish areas, from the producer to the consumer. Starting from the point of production, the market outlet options for farmers and fishermen are as follows:

- Sales to village residents. Direct sales to neighbouring households are commonly practised in the study areas. They can be advantageous to both the producer and the consumer since no time or money is spent going to the market. Likewise, because no intermediaries are involved, the price is often attractive to both parties. Payment can be made at the time of the transaction or a few days or weeks later. However, only very small quantities can be sold to village residents, and therefore most surplus production must be channelled to village or town outlets.
- Sales to itinerant traders. At the point of catch, producers also sell to small fish itinerant traders (*bepari*). In so doing they save time, face no price uncertainty and abstain from selling the fish at the market place, considered to be a low-status activity¹⁵. *Bepari* are fishermen who harvest ponds and either sell to village and urban market retailers or to consumers in rural *hats*. They often work in groups. Not surprisingly, the price fetched at the point of catch is lower than what could normally be obtained at the village or town market, after deducting transport costs. Sales on credit are commonplace as the parties involved normally know each other through past transactions. The producer is also aware of the trader's difficulty in paying on the spot for the fish and has an interest in securing the sale. Credit allows the buyer to operate with minimum own capital, paying the owner of the fish after selling the product at the village or town market.
- Sales to *hat* retailers. Nearby rural periodic markets are the preferred outlet for many farmers and fishermen, allowing them to save transport costs and time compared to the alternative of directing the product to the town *bazaar*. Often farmers do not possess the appropriate net equipment and have to rely on harvest fishermen, paying a fee or sharing the catch in return for the harvesting services. Some *hat pikar* also hire fishermen to harvest suppliers' ponds, in which case the produce is bought at the farm gate rather than at the *hat*. While very convenient to the farmer, this last option is the least attractive in terms of price, and payment is normally delayed by one or two days.
- Sales to *hat* clients. Fishermen and poorer farmers often sit at the *hat* and sell directly to the consumer. In so doing they fetch a higher price than if they were to sell to the retailer. However, such possibility is discarded by many, not only because of its status implications, but also because it is very time consuming and only feasible for relatively small quantities. Many farmers also mention lack of bargaining skills and scales as reasons for not selling directly to market clients.
- Sales to *bazaar* retailers. More commercially oriented fishermen and fish growers generally prefer to take their product to the town *bazaar*, where prices tend to be higher, thereby justifying the additional transport costs and time spent marketing the fish. Greater absorptive capacity is another significant advantage of town *bazaars*. At the village market the producer would have difficulties in selling in one go two or three maunds, or a

¹⁵ The issue of status in fish trading was raised during many of the field discussions and formal interviews. Lewis *et al.* (1996) also emphasise this aspect of seed and food fish trading.

few large units of high-value species, such as rui or catfish. The *bazaar* presents no such problems due to the concentration of consumers, many of whom possess reasonable purchasing power. The fish is auctioned on behalf of sellers to retailers through commission agents (*aratdar*), who normally charge three per cent of the auction price. Commission agents pay sellers at the act of sale but receive payment from *bazaar* retailers a few days later. They may also provide short-term credit to some outside village traders. *Aratdar* always sit at the market and seldom buy at the farm gate, although they sometimes co-ordinate supplies with fish farmers, informing them of the types of fish that are in short supply in the market.

As described above, several factors interact to determine producers' decisions regarding where and whom to sell their catch. These include marketable volumes, labour constraints, distance to markets, price and status. Go-Interfish participants that grow fish in rice fields or ponds generally have little to sell after meeting household requirements. Moreover, being engaged in a variety of farm and off-farm activities, they normally face acute labour constraints and thus try to minimise the time spent in marketing activities. For both reasons, most sell to neighbours and traders at the farm-gate or to retailers at the neighbouring *hat*. Selling to consumers at the *hat* is not well regarded, and hence uncommon. Those living within close distance from a town *bazaar*, say ten kilometres or less, may take advantage of low transport costs and carry their fish there, but only if the quantities justify it.

To summarise, there are three main marketing chains for locally collected or grown fish:

- The shorter and most straightforward one directly links the producer to the consumer in rural areas. A fair number of farmers and fishermen engage in direct sales to neighbours or *hat* clients, especially during the peak season, but each sells on average very small quantities.
- A second and more important marketing chain channels fish from the point of catch to *pikar* in rural periodic markets, either directly or through an itinerant trader or *bazaar* commission agent. *Pikar* then resell the product to residents from villages surrounding the *hat* and to the few restaurants or canteens that may be found around the market.
- Finally, there is a third marketing chain linking the producer to the town consumer. The fish is taken to the *bazaar* market by producers or middlemen. Commission agents then auction the produce to *bazaar* retailers, which is then bought by consumers from the town, the suburban area and peripheral villages.

In addition to these channels, there is a fourth and very important marketing chain for outside fish supplies. In the case of the southern districts of Rajshahi Division, local and outside itinerant traders often bring fish to town *bazaars*. Some *hat pikar* may also travel regularly to regional wholesale markets, for example Atrai in Noagon, to buy fish. More importantly, commission agents in town markets are connected to wholesalers/commission agents in major fish landing centres in surplus areas such as Southern Rajshahi, Chittagong, Cox's Bazar, Khulna and Barisal.

Local commission agents are responsible for organising fish imports on a regular basis. The process can be described as follows. Commission agents contact regular suppliers (*aratdar*) in surplus fish producing areas and inform them about their needs. The supplying wholesaler

then sends a consignment of fish to the region, and his agent goes to different markets where he has contacts with commission agents. In each *bazaar*, one or more local commission agents take variable lots according to previous orders, and auction them on behalf of the outside wholesaler to retailers sitting in the market and retailers from nearby markets. They retain a percentage of the auction price as commission fee, which is normally set at three per cent. The local commission agent is responsible for collecting the money from retailers after market hours or during the following days, once the fish has been sold to customers, paying the outside *aratdar* through bank transfer. Trust is a key element in these transactions, and the two parties involved know each other well through regular dealings and occasional meetings.

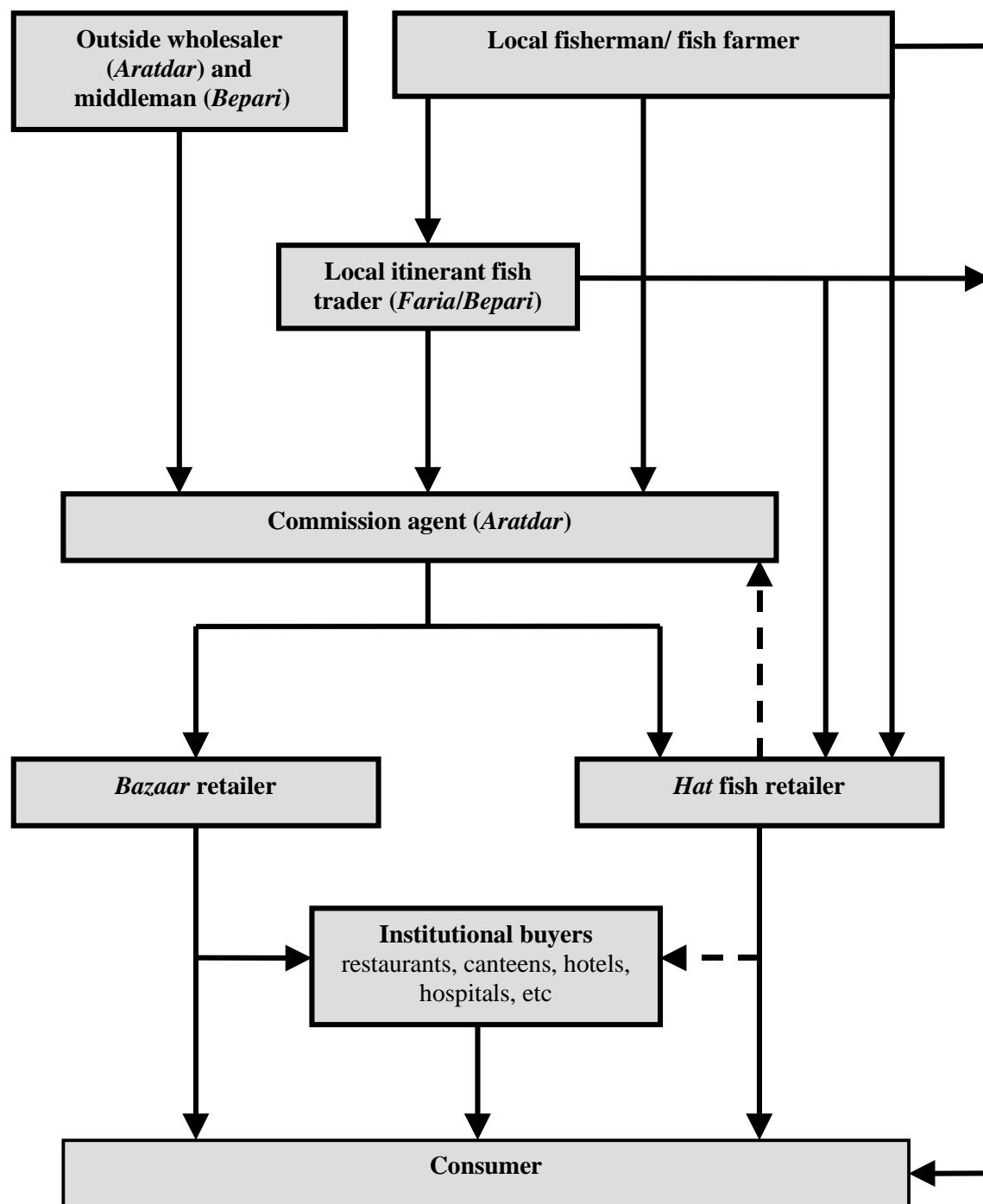
The town *bazaar* commission agent is a key actor in the marketing chain, assuring the smooth and efficient functioning of fish markets. Because of his strong involvement in imports from surplus producing regions, rural and urban consumers have regular access to varied fish supplies. Furthermore, since the commission agent provides short-term credit to fish retailers, little or no working capital is required to enter the fish retailing business, especially in the town *bazaar*. This leads to easy market entry and intense competition at the retail level, which is further intensified by the nature of the auctioning process, in which all interested buyers openly bid for the fish.

The critical role of local commission agents is seldom recognised by casual observers, who tend to regard them as just another intermediary in the chain, in between the producer and the consumer. The fact that the commission agent is generally wealthier than all other market players and that suppliers are compelled to use his services, not having the option of dealing directly with the market retailer, further contributes to such negative perceptions. What is not so often realised is that the commission agent charges a very small share of the retail price for his services and ultimately, it is in the interest of both suppliers and buyers in the *bazaar* to trade through the commission agent.

First, without the commission agent, the seller would have fewer buyers and would have difficulties in marketing his fish through a competitive bidding process. Him and the commission agent share the objective of selling at the highest possible price. Secondly, regular suppliers receive at times advances or loans from the commission agent, often free of charge but conditional on fish supplies being traded through him. Part of the catch is then taken as loan payment. Finally, *pikar* are not in a position to bring fish from outside areas and rarely have the funds to pay on the spot, thus having to rely on the commission agent to secure their daily supplies. The commission agent provides credit to suppliers and *pikar* so as to secure business volumes. Indeed, because commission agents operate with very small margins, their income is a function of traded quantities and bargaining skills. Commission agents have to compete with each other to attract scarce fish supplies and must have the financial capacity to link with as many suppliers and buyers as possible.

Figure 3.1 represents the different fish marketing chains in Go-Interfish areas, showing produce flows and the position of market players in the chain.

Figure 3.1
Fresh Fish Marketing Chains in Go-Interfish Areas



3.8 Price trends and behaviour

This section briefly discusses fish prices in Go-Interfish project areas. The analysis looks at time trends, seasonal variations, and different factors which influence prices at a particular moment in time. It is important to stress that no time series data on fish prices in the study areas or other regions of Bangladesh were found. This poses serious limitations to the analysis. Nonetheless, partial evidence gathered during the fieldwork and from other studies offers some insight into this important topic.

Government intervention in fish markets is minimal and prices are mainly determined by demand and supply forces. Some authors (Ahmad, 1997; Rahman, 1997) have reported that annual fish prices in Bangladesh have been rising significantly and above key agricultural commodity prices due to the gap between fish catches and a rising demand. In view of past supply and demand trends, it is reasonable to infer that real fish prices will remain favourable to producers in and outside Go-Interfish areas, thus providing an incentive for the continuous development of aquaculture along more commercial lines. While such developments are detrimental to consumers, they clearly benefit entrepreneurs and households that produce a marketable surplus.

Fish prices are known to follow a seasonal pattern. Prices are generally lower between July and February, rising during the following four to five months. Price seasonality is mainly a consequence of the seasonal nature of fish catches and the difficulties associated with fish storage over a long period. When supplies are scarce prices increase and vice-versa. Demand behaviour may also contribute to inter-seasonal price fluctuations. Many households are able to satisfy at least part of their consumption needs through occasional fishing activities during periods of abundance, but generally have to resort to the market during the lean season, causing additional pressure on prices. For example, between April and June supplies are scarce but demand is high, as this is the *boro* harvesting season and many households are employed as wage labour in paddy fields and involved in selling part of their own production, thereby having higher disposable income.

Once caught, fresh fish becomes a very perishable commodity which must be disposed of within the next few hours, especially in humid sub-tropical conditions. Consequently, prices are rather sensitive to gluts in the market. Sales cannot be postponed and therefore, if excessive supplies flow to a certain market on a particular day, producers and/or traders are forced to drop prices, sometimes quite considerably. On the other hand, scarce supplies generate profitable sale opportunities, even though consumers' low purchasing power may limit the extent to which prices can be raised.

Moreover, market prices differ according to specie and size. Inland species are generally preferred by the population. Major carps (catla, mrigal and rui) and catfishes (e.g. pangas) command very good prices in the market. Chinese carps (common carp, silver carp and mirror carp) are also popular but less expensive. Small wild species are at the lower end of the price spectrum. For the same specie, prices depend on the size of the fish, with larger fish (above one kilogram) fetching significantly higher prices per kilogram. A premium of 50 percent or more for the larger product is not uncommon.

Freshness is another factor that influences prices. Looking at the reddish hue of gills and the sinking of eyes, pressing the fingers in different parts of the body, and smelling the fish are

some of the techniques used by buyers to assess product freshness. Aware of this, it has been reported that fishermen and traders sometimes apply artificial colours on fish gills or body in an attempt to influence the buyer's perceptions about product quality (Ahmad, 1997). During trading hours, some species are kept alive in tin pots and ice is sometimes used to preserve dead fish. The fish is also splashed with water to give it a fresher appearance.

Auctioning in the *bazaar* takes place early in the morning. As the market day approaches its end, retailers drop prices in an attempt to avoid keeping unsold stocks, which must be preserved with ice, usually in wooden crates, until the next morning. During storage, the fish loses freshness and has to be sold for a lower price. Some *bazaar pikar* prefer to take unsold fish to village *hat* markets later on during the afternoon rather than sell it at the *bazaar* the following day for a low price. However, trading in the rural *hat* is a lower status activity, and one that many urban *pikar* are unwilling to undertake (Lewis *et al.*, 1996).

Finally, prices vary from market to market. Discussions with farmers and traders and data collected from different markets suggest that prices in town *bazaars* tend to be higher than in village *hats* due to a larger concentration of consumers and superior family incomes. However, it is difficult to generalise. Daily supply and demand balances in a particular market day influence prices. Furthermore, a significant proportion of fish supplies in village markets which are situated in very low production areas are procured in *bazaars*, and *hat* retail prices may as a result be higher than in the supplying town market.

In sum, fish retail prices depend on various factors, including season, daily supplies, specie and size, product freshness and market outlet. To illustrate the discussion, table 3.2 presents retail price data at three markets in Dinajpur District during late June. Large price variations in the same market for certain species reflect fish size differences. Data for Rangpur and Thakurgaon districts are included in Annex 9.

Table 3.2 Retail prices in different markets in Dinajpur District, June 2001

	Okrabari Hat Chirirbandar Thana Tk/Kg	New Bazaar Parbatipur Town Tk/Kg	Bahadur Bazaar Dinajpur Town Tk/Kg
Mrigal	60-64	70	65-70
Rui	60-64	75	120
Catla	-	60	80-130
Common carp	60	62-64	60-65
Silver Carp	40	52-55	40-65
Tilapia	-	-	55
Sarpunti	60	-	55-60

Source: Price survey, June 2001

3.9 Marketing margins

Margin analysis is a useful tool to assess the efficiency of marketing systems, especially when complemented with information on marketing costs and risks, providing insights into the existing degree of market competition and marketing strategies which could yield significant benefits to producers. The analysis is based on data collected during fieldwork. Therefore, it applies to a particular moment and does not reflect seasonal variations.

Trading margins along the product chain were found to be relatively low. Moderate margins are an indication that fish trading environments are characterised by a fair degree of competition at both ends of the market. Producers are rarely dependent on a single outlet or buyer, enjoying a considerable range of options within relatively short distance¹⁶ and facing no difficulties in selling their marketable surplus. Lack of income opportunities is breaking down traditional status barriers into fish trading (Lewis *et al.*, 1996), which requires little initial and working capital since fish supplies on credit are widespread. Competition at certain town markets has intensified over the past few years, following an inflow of many newcomers. Turnover is also high, and many traders abandon the business to pursue other more profitable opportunities. A large number of *pikar* can be found in town retail markets competing for fish and clients. Some town markets accommodate up to 100 retailers. While only four or five *pikars* may sit regularly at some village *haats*, several fishermen and farmers may also come to the market to sell their catches directly to consumers.

Clearly, competition amongst traders is not the sole determinant of market margins. For example:

- Fish traders typically handle small quantities, in what is a time-consuming activity. The margin imputed on the final price must provide the trader with a minimum return on his labour. In other words, itinerant traders and retailers must ensure that a minimal income is made out of modest sale volumes.
- Fish is an extremely perishable commodity. Discussions with market participants indicate that spoilage sometimes occurs. Moreover, lowering prices at the end of market days to avoid inventory accumulation and the sale of stale fish is a common practice. Trader margins must therefore be high enough to compensate for losses arising from spoilage and the sale of stale fish.
- Traders must take marketing costs into account when adding a margin to the price paid for fish. Although small quantities increase average marketing costs, these normally account for a relatively small proportion of the market price, mainly due to short transport distances and lack of storage. Transport, labour, ice and market fees are some of the marketing costs. Net and gear purchases and repairs may represent a significant cost for some traders involved in pond harvesting. The relevance of different cost elements varies according to trader category.

Fishermen and farmers selling directly to *bazaar pikar* through commission agents appropriate 80 to 90 percent of the retail price. The commission agent normally retains 3 percent of the auction price, but in a few markets a 4 or 5 percent commission is charged.¹⁷

¹⁶ It must be acknowledged however, that certain factors may constrain the producer's choice of market outlet or buyer. For example, in some communities many producers refuse to sell fish at the market for prestige reasons. They are therefore left with the option of selling to neighbours or a few itinerant and *haat* traders. If for any reason they have special ties to a certain local retailer or fisherman, they may not consider selling to another party. To complicate things further, the fish trader normally occupies a lower social position than large pond fish suppliers, being constrained in his bargaining behaviour.

¹⁷ The *aratdar* charges a very small commission fee but handles large quantities, auctioning between 10 and 30 maunds per day. In the bigger *bazaars*, during periods of abundant supplies, *aratdar* may handle up to 45 maunds of fish in one single market day. Furthermore, commission agents face very few risks. Because they are only involved in auctioning the fish, they do not have to worry about unsold inventories and product spoilage. Still, the commission agent has an interest in avoiding excessive supplies in the market, since this would affect

The retailer normally operates with a 5 or 10 Tk margin per kilogram. For bigger and more expensive fish, he may charge 15 or 20 Tk above his purchasing price. In percentage terms, retail margins at the *bazaar* normally vary between 7 and 15 percent. They may drop below these levels in days of abundant supply, at the end of market hours or when the retailer sells fish that was purchased the previous day and is no longer very fresh.

Table 3.3 shows typical marketing margins during the time of the survey for one fish retailer at the Pauro *Bazaar* in Rangpur town. He trades approximately 20 kilograms each day. It is important to take into consideration that collected prices refer only to some high-price species and do not reflect the whole product range traded by *bazaar pikar*, which may also include less valued fish. Annex 10 presents some examples from other *bazaar* markets in Go-Interfish areas.

Table 3.3 Marketing margins for fish, Pauro Bazaar, Rangpur Town, June 2001

	Common carp	Silver Carp	Mrigal	Rui
1. Producer selling price (Tk/Kg)	67.9	67.9	77.6	97
2. Commission (Tk/Kg)	2.1	2.1	2.4	3
3. Retailer purchasing price (Tk/Kg)	70	70	80	100
4. Retailer selling price (Tk/Kg)	80	75	90	120
5. Retailer gross margin (%)*	12.5%	7%	9%	17%
6. Producer's share of retail price (%)**	85%	91%	86%	81%

* Retailer gross margin = (4) – (3) / (4)

** Producer's share = (1) / (4)

Haat retail margins show greater discrepancies than at the *bazaar*, reflecting a wider variety of situations. Purchases at the village market or farm-gate are conducted through bargaining rather than open auction and the relations between transacting parties are at times rather informal and personalised. In addition, *hat pikars* often spend time and money procuring supplies outside the *hat*, normally at the point of catch and town *bazaars*. Generalisations are therefore difficult to make.

Generally speaking, margins are higher at the *hat* than at the *bazaar*, and the producer's share of retail prices lower, more so when the retailer purchases at the point of catch and is responsible for harvesting the pond. Table 3.4 presents the case of one *pikar* at Kochabari *Hat*, in Thakurgaon Sadar Thana, during the time of the survey. He normally sells between 20 and 50 kilograms of fish per day. He buys at the *hat* from fishermen and farmers; hires fishermen to harvest suppliers' ponds; and regularly goes to the Kalibari *Bazaar*, in Thakurgaon, 15 kilometres away. Annex 11 includes other examples taken from different rural *hats* in Dinajpur, Rangpur and Thakurgaon districts.

his commission, and for this reason he may sometimes store fish until the next day. Some retailers may fail to pay the commission agent, but such situations are rare, as default normally implies that they will lose the right to trade fish in the *bazaar*. The commission agent normally employs between two and eight workers, who are responsible for unloading, weighing, cleaning, sorting, handing over the fish to buyers and receiving payments. Each earns a daily wage of 30 to 60 Tk. Other incurred costs include transport and maintenance during visits to distant wholesalers, telephone expenses, ice, market fees, and entertainment expenses.

Table 3.4 Marketing margins for fish, Kochabari Hat, Thakurgaon Sadar, June 2001

	Common carp	Silver carp	Sarpunti	Mrigal	Rui
1. Retailer purchasing price (Tk/Kg)	50	35	45	55	55
2. Retailer selling price (Tk/Kg)	60	50	60	65	65
3. Retailer gross margin (%)*	17%	30%	25%	15%	15%
4. Producer's share of retail price (%)**	83%	70%	75%	85%	85%

* Retailer gross margin = (2) – (1) / (2)

** Producer's share = (1) / (2)

The discussion so far focused on situations in which the producer sells to the market retailer, directly or through a commission agent. Naturally, the larger the number of intermediaries along the product chain the lower will be the producer's share of retail prices. No data for itinerant fish traders was collected, and therefore it is not possible to draw any conclusions regarding practised margins. Like retailers, itinerant traders generally deal with small quantities and bear the risk of product spoilage. They often work in groups and spend considerable time procuring fish supplies and carrying them to different markets. The product is normally transported by bicycle, rickshaw van, tempo or bus. Ice is sometimes used for fish conservation.

In concluding, evidence collected during fieldwork suggests that fish marketing in Go-Interfish areas is not characterised by excessive or abnormal profits. Trader margins are moderately low taking into consideration the volumes handled and the risks and costs incurred¹⁸. These margins may well be lower during the peak marketing season, which are characterised by more abundant supplies and more intense competition from large numbers of seasonal, part-time and occasional market participants. Moreover, local producers often receive a reasonably high share of the retail price. This is not surprising given that existing competition for fish supplies and customers is high, the number of intermediaries in the product chain low, and distances between the point of catch and retail markets short.

3.10 Key marketing problems and constraints

3.10.1 Problems and constraints faced by traders

i. Product spoilage

Spoilage is one of the problems most commonly mentioned by fresh fish traders in Go-Interfish areas. Rahman (1997) suggests that in Bangladesh approximately 10 percent of fish caught may become spoilt and unsuitable for human consumption in the absence of cold chain systems. The Bangladesh Fisheries Development Corporation (BFDC, 2000a) puts post-harvest losses in inland fisheries at a high 30 percent. This figure is most probably inflated and certainly excessive in the context of the study areas, where marketing distances are short and the number of market intermediaries small. According to a recent project feasibility study conducted in the Northwest by the Asian Development Bank (ADB), on

¹⁸ These conclusions are in line with the evidence presented by Ahmad (1997) for three floodplain areas in Western Bangladesh.

behalf of the Government of Bangladesh, annual fish losses in the region amount to 9,000 tonnes (BFDC, 2000b).

Sometimes fish arrives at the market in poor condition due to transport delays or poor handling. Having been exposed to the sun, flies and/or other contaminants, the fish is frequently sold in far from ideal hygienic conditions. If the product is not disposed of within the same market day, it must be kept until the next morning or afternoon, often in poor storage conditions. Fish cold storage facilities are not available in the region. Some rural *hats* have no nearby ice plants while in many others local ice production is limited and insufficient to meet trader needs. Power cuts are common and disrupt production by ice plants. Ice is therefore expensive.

Product spoilage inflates marketing costs and margins and affects product quality, thereby hurting producers and consumers alike. BFDC, under the Ministry of Fisheries and Livestock, attaches great importance to this problem. A five-year project aimed at improving fish marketing infrastructure in eight markets in Northwest Bangladesh through a US\$ 5.6 million grant from ADB is on pipeline. Proposed investments include packing sheds; semi pucca barracks; training and conference rooms; electrification, sanitation and sewerage systems; equipment; and ice producing facilities.

ii. Low profits

When asked about their problems and constraints, some traders mentioned low and variable profits. This provides further evidence that retail markets, especially in urban areas, are characterised by intense competition. Other factors that explain low profitability include spoilage; limited local fish supplies; reduced business volumes during the off-season; heavy rains, which disrupt fish transport and selling activities; and sporadic market gluts due to lack of co-ordination amongst large numbers of market players.

iii. Credit

Interestingly, apart from *aratdar*, there were few traders that during field discussions mentioned lack of capital and credit as a key constraints to fish trading. While this may seem surprising, given that most have no access to formal credit sources, it reflects the small-scale nature of fish marketing activities and the widespread short-term, informal credit flows along the product chain.

Fish retailing activities are not capital intensive and require minimal initial investment. For example, to start trading fish at the *bazaar*, a retailer basically needs one scale, one basket, one knife and a polythene cover. He must also have some initial working capital to buy fish before being eligible for credit from the commission agent. At the same time, working capital needs are low due to the fact that traders typically handle small quantities of fish and have limited scope for scaling-up their fish trading activities. In view of the large number of people involved in the business and the perishable nature of the product, there are clear limits to the amounts that individual traders can market each day. Still, situations exist in which some retailers have been able to accumulate capital over the years, graduating to the position of commission agent.

Finally, purchases on credit are common, with traders paying suppliers after the fish has been sold. Such credit mechanisms are a response to acute cash constraints along the chain and absolutely critical to the smooth and efficient functioning of fish marketing systems, benefiting the two parties involved. In other words, credit is instrumental in facilitating sales. Itinerant fish traders and *hat* retailers buy on credit from pond farmers, fishermen and commission agents. *Bazaar pikars*, in turn, obtain their supplies on credit from commission agents.

Commission agents supply credit to buyers and make advances to local farmers and fishermen, but may also be able to delay payment for outside orders for a few days. Occasionally they have access to interest-free loans from other *bazaar* commission agents. On the whole however, commission agents are net credit providers. Financial capacity is therefore critical to the success of their business, and quite a few *aratdar* have abandoned fish trading activities over the recent years as a result of financial difficulties. While in some town markets the number of commission agents has risen over the past few years due to increased local supplies and/or demand, in other markets the reverse has happened.

3.10.2 Problems and constraints faced by Go-Interfish farmers

i. Low production

Interviewed Go-Interfish farmers had difficulties in pointing out critical problems they face in food fish marketing. This is not surprising. Go-Interfish project participants tend to produce small marketable surpluses in a context of insufficient local fish supplies. According to a survey conducted amongst 140 Go-Interfish households that produce fish in paddy fields (CARE, 2001), average marketed quantities per household and season amount to approximately 10 kilograms. Consequently, farmers do not experience major difficulties selling to consumers or traders in nearby areas. In such context, post-harvest issues are important but much less so than production problems.

Generally speaking, the main concern of Go-Interfish participants is not having enough fish to meet household consumption requirements and for market sale. Go-Interfish tries to address both needs through the transfer of fish culture know-how and skills to project participants.

ii. Availability, cost and quality of fish seed¹⁹

Fish seed accounts for a very significant proportion of fish culture costs. In the case of Go-Interfish farmers, fish seed is responsible for approximately three-quarters of total fish input costs (CARE, 2001). Moreover, seed quality is determinant for fish growth rates and yields. Access to good quality seed at a reasonable cost is therefore one of the most important factors for the development of profitable aquaculture (Gupta, 1995).

Go-Interfish areas lack adequate sources of wild hatchlings. Some private and public hatcheries can be found in the region – especially in Dinajpur, Rangpur and Gaibandha districts – but they are clearly insufficient to satisfy existing demand (Lewis *et al.*, 1996). The

¹⁹ This section is largely based on Lewis *et al.* (1996), which provides an in-depth analysis of fish seed marketing networks and systems in Northwest Bangladesh. See also NFEP (1998).

excessive iron content of groundwater seems to pose particularly stringent constraints to the development of a profitable hatchery industry. Other impediments include lack of sufficient technical know-how, limited availability of chemicals and hormones, and shortage of good quality brood stock.

As a result of insufficient local production, significant quantities of fish seed is imported from Jessore and Bogra during the months of May, June and July. Fry and small fingerlings are carried over long distances and in small quantities by itinerant traders. While some may transport the seed directly to nursery or food fish ponds in Go-Interfish areas, most often the chain comprises two or three intermediaries. Margins are very high but so are the efforts and risks associated with fish seed trading, and losses are not uncommon. During transport fingerlings are subject to a lot of stress. Mortality rates may be high and the risk of losing the whole stock is real. By the end of the trip the condition of the fingerlings may begin to deteriorate and sales must be realised as quickly as possible. Client networks and pre-arranged transactions are therefore very important. Since the pond operator has difficulties in judging the quality of the seed on offer, the small trader must rely on his contacts, reputation, knowledge of the market situation, and bargaining skills to successfully finalise the transaction. Although sales on credit are frequent, partly to protect buyers against poor quality seed, traders are often reluctant to extend credit to poor farmers and typically favour larger clients.

Go-Interfish has been promoting fish seed production amongst project participants, but efforts so far have been focused on common carp, which breeds naturally and requires no knowledge of induced breeding techniques. Most project farmers are therefore partly dependent on local nursery operators and itinerant traders to obtain fry. Despite the extra transportation costs, imported seed is often cheaper than locally produced fry and fingerlings. Complaints about availability of seed, its poor quality and high price are common. As discussed above, this situation represents a serious obstacle to the development of fish culture activities by Go-Interfish farmers.

iii. Lack of refuge ponds

The majority of small ponds in Go-Interfish areas are rain-fed and seasonal, retaining water only for six to eight months throughout the year. At the same time, many farmers who grow fish in paddy fields do not own ponds. Both factors significantly constrain their capacity to exploit profitable off-season and price premium opportunities.

Short rearing time in paddy fields or seasonal ponds results in undersized fish. Sometimes marketing may not even be an option, as the sale of fish under 9 inches is banned by law. Farmers without access to refuge or perennial ponds are unable to hold fish and wait for it to mature so as to take advantage of higher prices. Moreover, they are forced to catch and market fish at particular moments in time, being unable to postpone sales until periods of low supply and/or high demand. Selling undersized fish during the peak marketing season implies that farmers are doubly penalised in terms of price obtained. For example, during the *aman* season, most farmers catch the fish from the fields around November, as the water starts receding and before the paddy is harvested. Large quantities of fish are available in the market at that time and prices are relatively low.

Naturally, those that have the opportunity to stock fish for longer periods are better positioned to take advantage of market opportunities, but must balance the benefits of higher future prices against the additional production costs of holding fish until it reaches optimum size and the risks of disease and theft. Urgent cash needs may also militate against such strategy.

iv. Limited marketing experience and poor access to market information

Informed marketing decisions entail reasonable knowledge about prices in different markets, the transport cost to each of these markets, and price behaviour according to fish size and season. However, because fish culture in ponds and rice fields is relatively new to many Go-Interfish farmers, most have little or no experience in fish marketing and somewhat limited access to market information. Learning about the benefits, costs and risks of different marketing outlets and strategies takes time. In the meantime, profitable opportunities may be forgone.

For example, last year, in Bachudepur village (Thakurgaon Sadar Thana), a group of farmers which was involved for the first time in integrated rice-fish cultivation decided to harvest and market the fish in November, at a time when prices were low. They had the possibility of holding the fish for one or two months more, but were unaware that prices would be higher and additional profits could have been made. Similarly, in Mithapurkur Thana, one farmer mentioned that he used to sell to fishermen/itinerant traders at the point of catch until he realised that he could obtain a much better price at Shatibari *Bazaar*. He now markets all his fish through a commission agent that sits at the *bazaar*.

In the absence of adequate information, the tendency is for producers to pursue very localised marketing strategies, selling at the point of catch or the nearest rural *hat* every time they face some cash needs or have to harvest their paddy fields or ponds. For households with above average production levels this may be a sub-optimal strategy, not only because fish is frequently sold for a lower price than what could be obtained in town *bazaars*, but also because it does not expose producers to wider marketing networks and realities, limiting their access to market information²⁰.

It is only when surplus production becomes important that farmers find it worthwhile to invest time and resources monitoring the market situation and taking their produce to more distant and remunerative outlets. Large and more commercially-oriented pond fish farmers visit markets and check prices on a regular basis, waiting for a favourable moment to harvest and sell. They also have regular contacts with commission agents, with whom they can co-ordinate the time and specie content of transactions, according to prevailing market prices. Most Go-Interfish farmers lack such connections.

²⁰ The critical importance of networks for accessing market information (and credit) is emphasised by Lewis *et al.* (1996) in the context of fish seed trading.

3.11 Opportunities for intervention

3.11.1 Preliminary considerations

Following the analysis presented in the previous sections of this chapter, four possible intervention areas were identified as having the potential to address some of the constraints and needs of many Go-Interfish farmers:

1. Integration of marketing-related issues into extension messages.
2. Group co-operation for food fish marketing.
3. Promoting access to good quality fish seed.
4. Food fish stocking.

In isolation, each of these intervention areas may not offer much scope for improvement. The constraints faced by Go-Interfish farmers at the marketing level are manifold and difficult to address through single interventions. However, together they have the potential to generate tangible benefits to Go-Interfish end clients.

It is important to bear in mind that each of these options requires to varying degrees further analysis and careful adaptation to the specific environment and circumstances experienced in different communities and by different households within the same locality. Across-the-board interventions will normally fail to address the specific needs of very different communities and households. Furthermore, it is important to carefully assess the cost implications and likely benefits, risks and trade-offs of each option before translating recommendations into action. Sustainability issues must also be considered. Finally, the institutional needs and changes required to carry out new marketing interventions must be addressed beforehand.

3.11.2 Integrating marketing issues in extension messages

Marketing-related messages are not explicitly integrated in Go-Interfish extension activities. Farmer field school (FFS) activities are essentially centred around production aspects, reflecting the project emphasis on the introduction of new fish culture technologies and practices amongst end clients. While individual field staff may sometimes discuss marketing issues with project participants, it is not clear how often that happens and how well informed project staff are about such issues. Furthermore, these attempts are undertaken on an ad-hoc basis and not part of an overall project design and strategy.

Lack of experience in fish marketing and inadequate access to market information limits the ability of farmers to command favourable market prices. Therefore, there is a strong case for incorporating marketing issues within the current FFS curriculum. Fish farmers should be able to link production and marketing decisions, if they so wish. Discussions with farmers should focus on the analysis of the costs, risks and potential benefits of different production-marketing strategies and options. Information on price volatility and levels at different local markets, seasonal price behaviour for different species, and the premium paid to size must be provided if farmers are to make informed judgements. Possible options for holding fish to

allow farmers to take advantage of higher prices should be explored and discussed with project participants. Advice on adequate fish handling and packaging practices to minimise spoilage is also important.

The introduction of marketing-related issues in the FFS curriculum should not present major problems. No new project structures or field staff member needs would be created. Training may be however required to increase the capacity of field staff to monitor local markets, assess and pursue opportunities, and extract relevant lessons. Field trainers also need to be able to transfer market analysis skills to farmers.

3.11.3 Group co-operation for food fish marketing

Group marketing is one example whereby co-operation amongst farmers may overcome some of the problems they face in fish marketing. As mentioned before, low production levels and acute labour constraints prevent Go-Interfish farmers from selling fish at town *bazaars*, where prices tend to be higher. The additional income earned does not normally justify the time and resources spent travelling to town, even if the latter is not far from the village, which is often the case.

However, if several farmers become involved in jointly marketing their fish surplus, transport costs can be shared between all group members, no longer constituting an impediment to sales at the *bazaar*. Moreover, because only one or two farmers will have to travel to the market, most group members will not spend any of their scarce time selling fish. The cost of information gathering with buyers will also be reduced, as these activities may be undertaken by one single farmer. Over time the group can develop relations with specific market *aratdar*, who may serve as a useful source of market information. If marketable production develops in such a way that the *aratdar* has an interest in securing the group supplies, members may occasionally access small cash advances.

Groups can also develop links with nearby rural market retailers. Since larger quantities of product can be made available at once, the retailer saves time and transport costs compared to the alternative of procuring supplies from different sources. Furthermore, the fish is fresher than competing supplies bought at the town *bazaar*. Acting as a group would therefore enable Go-Interfish farmers to gain a stronger bargaining position vis-à-vis retailers. Because group marketing strategies are advantageous to the retailer, he may be willing to offer better prices. Finally, while the retailer does not have the incentive to co-ordinate transactions with very small suppliers, the situation may change when he can satisfy his requirements for a particular day from one single source. The time spent co-ordinating sales would also be minimised by the fact that not all group members need to be involved.

It is important to note however, that the formation of groups for marketing purposes presents significant challenges. It became very apparent during field discussions that farmers in Bangladesh, as in many other parts of the developing world, have a highly individualistic attitude towards marketing and are rather suspicious of any group business undertaking. Moreover, co-ordination of group activities is not only time-consuming but also costly in terms of reduced individual freedom to take marketing decisions. For example, co-ordinated harvesting of ponds and paddy fields well in advance of auctioning opening hours will be needed if farmers are to jointly transport their fish supplies to town markets.

In face of these problems, marketing groups will only work when joint sales generate clear financial gains and when a high degree of trust exists between members. Strong leadership and initiative is another important requisite for group cohesion and success. Given the above considerations, groups should be rather small and informal. Membership to the group should not imply any financial contribution or commitment nor should all members need to participate in every transaction. Rigid meeting schedules should be avoided. The basic idea is that a small group of interested farmers informally decide to bulk up their production and jointly organise transport to the market. The division of proceeds takes place immediately after the transaction has been realised.

A clear opportunity exists to build upon the experience of some Go-Interfish farmers in collective fish farming in paddy fields. The fact that project participants already co-operate in fish growing activities is an indication that they may also have an interest to co-operate in marketing activities. Go-Interfish could consider exploiting this opportunity.

3.11.4 Promoting access to good quality fish seed

CARE is well aware of the critical importance of fish seed to the success of Go-Interfish project. First, access to good quality seed at the right time is fundamental if farmers are to achieve increased fish production and consumption levels. Second, the sustained adoption of integrated pest management techniques in rice farming is central to the project concept and partly dependent on successful fish production in the paddy field. Finally, high fish production levels allow farmers to have a surplus for sale, thus contributing to household cash income.

The project supports the production of fish seed at the village level. In a market environment characterised by irregular supplies of dubious quality, this is seen as necessary to guarantee that project participants have reasonable access to fish seed. Local fish seed production is also considered a potentially good source of income to project households. Farmers produce fish seed in rice fields, small ponds, nurseries or natural ponds using simple management techniques. The seed is either sold as hatchling and fry or restocked in rice fields and ponds for food fish production. So far production has taken place during the *Boro* season only and focused on common carp seed. A pilot initiative is scheduled to start this *Aman* season and will target species other than common carp.

Fish seed production has faced problems during the last two seasons, partly as a consequence of irregular water availability. Only 2-3 percent of the hatchlings survived. These survival rates are extremely low and well below the project long-term target of 30-40 percent (CARE, 2001). As a result of these problems, fish seed production has recently been the focus of increased attention.

Whilst improvements to the current approach to fish seed production at village level are being explored, it appears that other intervention options are not being contemplated. A more diversified strategy could probably prove suitable to meet project objectives in this area. Indeed, the effectiveness of the current strategy is largely dependent on farmers being able to produce enough good quality seed to satisfy the needs of at least some village households, which is not the present case. Consequently, primary and secondary adopters continue to face difficulties in accessing fish seed.

Although it is beyond the scope of this study to present detailed and carefully thought recommendations on such a complex area, it may be worthwhile to consider alternative options to complement existing project strategies in the area of fish seed production. These may include, for example, the promotion of local seed production on a more commercial level and the development of market linkages between project farmers and fish seed producers and traders. This type of approach has the potential to benefit large numbers of fish producers, including project participants, through selective support to a few sub-sector players. Thus, improved and sustained access to fish seed can be achieved in a cost-effective manner.

Artificial fry production has the potential to generate large profits given the right soil conditions, availability of chemicals and hormones, good brood stock, sufficient initial and operational capital, high market demand, adequate technical knowledge and access to networks of clients and market information (Lewis *et al.*, 1996). Local hatcheries seem to face problems in most of these areas, and this explains why the mini-hatchery industry in Go-Interfish areas has not experienced the growth seen in Jessore and more recently Bogra. This in turn affects the development of local nurseries, since proximity to sources of hatchling is a critical factor.

Go-Interfish could provide selective support to hatchery entrepreneurs operating in project areas to address some of the problems they face while at the same time linking them with groups of project farmers. If effective, this support would lead to a sustained improvement in the availability and quality of local hatchlings. Benefits would be spread over a large number of nursery pond operators and food fish producers, but Go-Interfish farmers could also profit from such an intervention, especially if market linkages with hatchling and fingerling suppliers could be successfully developed by the project.

An alternative would be to promote the development of new mini-hatcheries. Village entrepreneurs and partner organisations could be targeted for assistance. Credit may be required to kick start and sustain the activity during the initial stages. Transfer of business skills through training may be equally important. Special attention would need to be paid to the quality of underground water and the existence of enough and unsatisfied local demand, since there is not much point in providing technical and other support to hatcheries when such fundamental pre-conditions are not in place.

A similar approach could be developed to assist existing or new nurseries at the village level. Nursery businesses can be quite profitable and require much less capital outlays than hatcheries. However, nursery operators face significant risks from early drought and water supply failure (NFEP, 1998). For this reason, support should be channelled to nursery farmers that either have ponds with good water retention capacity or access to groundwater and resources to pump that water into the pond. One important area to focus on is technical assistance on pond management practices.

From a project perspective, it only makes sense to address the fish seed supply problem if that leads to improved access to fish seed by project participants. The link is not obvious. Small and marginal farmers purchase very small quantities of fish seed and may lack the capacity to pay on spot. Partial purchases on credit also make sense as an insurance mechanism, since the quality of the seed can only be assessed some time after having been

released in the pond or paddy field²¹. Hatcheries, nurseries and fry traders prefer to sell to larger clients and may therefore discriminate against small and marginal farmers. Moreover, these farmers may not have access to public hatcheries, as these are often distant from the village and do not sell on credit.

Consequently, supply-oriented interventions must simultaneously address access problems. This can be achieved in several ways:

- First, the promotion of fish seed production within project areas is conducive to the development of networks between suppliers and project farmers, while at the same time overcoming the quality problems that may arise when the seed has to travel long distances.
- Second, by providing support to fish seed producers, Go-Interfish is well positioned to foster market links between these and project farmers. Hatchery and nursery pond owners can even be trained and used to disseminate extension messages amongst clients. The Northwest Fisheries Extension Project used a similar approach with fry traders, apparently with very good results (Lewis *et al.*, 1996; NFEP, 1997).
- Finally, group fish seed purchases may be promoted to address the problem of farmers having difficult access to fish seed because individually they buy marginal quantities. This approach may be particularly successful when farmers buy from itinerant fry traders. Because fry is extremely fragile and perishable commodity, the trader is usually under immense pressure to sell his supplies as quickly as possible. Selling marginal quantities to many dispersed clients is not in his interest, but if the transaction can be previously coordinated with a group of farmers, the trader has an incentive to travel to their respective area to sell fry. Again, a group approach can be complemented with market linkage promotion efforts.

3.11.5 Stocking of food fish

Stocking fish not only widens the options available to farming household regarding the timing of consumption and marketing activities but also creates opportunities for the sale of more mature fish. Farmers without the possibility of holding fish due to a lack of refuge and permanent ponds cannot take advantage of profitable off-season marketing opportunities and have no option but to sell undersized fish. Although it is not clear to the consultant how this problem could be addressed in the context of Go-Interfish project, it is an issue that deserves serious consideration. The possibility that individual ponds with larger water retention capacity could be used by other farmers may be unrealistic but is worthwhile exploring.

²¹ Quality assessment problems are further complicated by the multiple factors that have an influence on the fish seed performance. For example, the availability of natural food in the pond is critical for fish survival and growth. Fish culture practices and weather also play a major role.

CHAPTER FOUR

VEGETABLE MARKETING SYSTEMS IN NORTHWEST BANGLADESH

4.1 Introduction

Marketing constraints and risks are critical to understand why farmers in Bangladesh have been reluctant to scale-up vegetable cultivation. Project interventions aimed at addressing these problems are therefore important for achieving sustained increases in vegetable production. Unfortunately, vegetable marketing systems in Bangladesh are poorly understood and information to support project activities is lacking. This chapter aims to shed some light on these issues. In addition, several opportunities for intervention are identified. More focused research and analysis are however needed before some of the study recommendations can be put into practice.

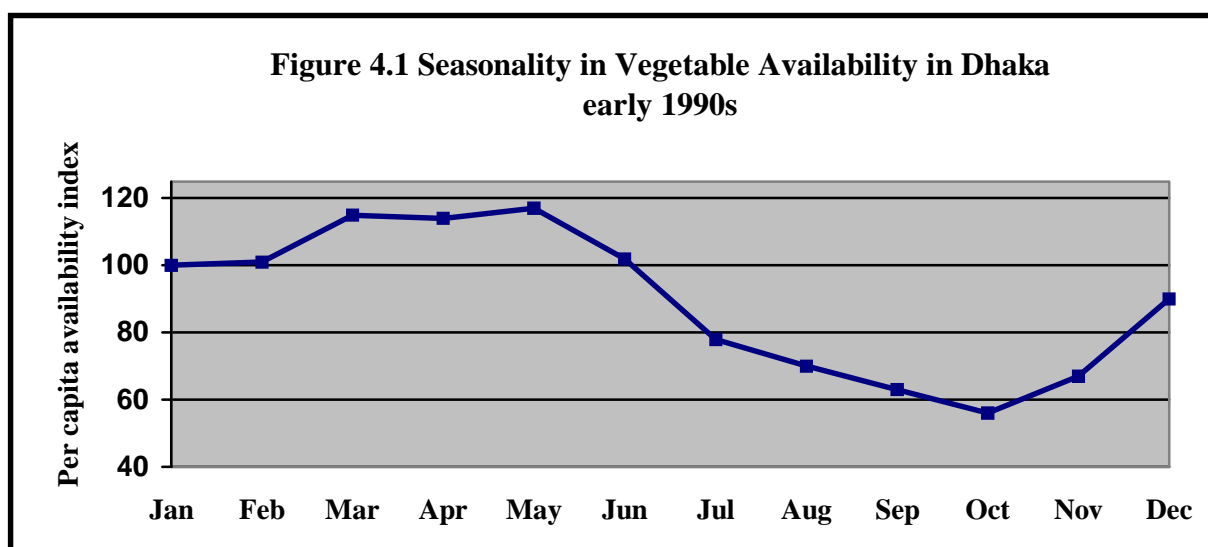
4.2 Vegetable production in Bangladesh

Bangladesh produces a wide variety of tropical and sub-tropical vegetables²². Subsistence vegetable farming remains the dominant mode of production, but cultivation around the main urban centres is gaining commercial importance. The selling of vegetables is common even among the smallest growers, not only as part of an income-generating strategy, but also to prevent product spoilage. Because most vegetables are highly perishable and cannot be stored for more than a few days after harvest, farming households are oftentimes unable to absorb all production, having to sell the surplus.

Vegetables can be suitably grown in very small and scattered parcels of land. Consequently, landless rural households and marginal farmers are often involved in vegetable gardening activities. The fact that these crops are commonly grown within the homestead also explains the strong involvement of women in the production process. Generally, women are partly or fully responsible for land preparation, planting, weeding, and harvesting operations. They are also responsible for preparing and cooking the vegetables, and it is them who normally undertake most post-harvest activities. As with most other crops in Bangladesh, however, market sales are generally carried out by men.

Production is highly seasonal (figure 4.1). The winter season is the most suitable for vegetable cultivation, as temperatures and humidity levels are lower, vegetables less susceptible to pest and disease infestation, and yields higher. More dry land is also available. Unsurprisingly, winter vegetables account for approximately two-thirds of total production (Haque, 2001). Summer vegetables tend to be planted early on during the *kharif* season. Vegetable supplies are more abundant during the first half of the year, peaking from March to May. Availability is lowest between August and November.

²² This chapter does not cover tubers, such as potatoes.



Source: Ali and Tsou (1997)

There is significant potential to develop vegetable production in Bangladesh. Vegetables compare very favourably to other crops in profitability terms and the future performance of the sector will largely determine how successful the country is in diversifying its agricultural production base and achieving higher agricultural growth rates (Ateng, 1998; Mahmud *et al.*, 2000). However, in the past production has been hampered by risk factors and other constraints, barely keeping pace with population growth.

Several factors interact to explain the relatively poor past performance of the vegetable sector. First, an expansion of planted areas is difficult due to existing on-farm water management systems, which do not allow rice and non-rice crops to be planted in the same service units (Ateng, 1998; Mahmud *et al.*, 2000). This has discouraged the use of modern irrigation for the cultivation of high-value crops such as vegetables. Given the limited prospects for increasing the area under traditional irrigation, the scope for future expansion of planted areas is largely dependent on changes to current water management systems.

Second, technological developments in vegetable cultivation in Bangladesh have been modest, reflecting the overwhelming dominance of rice in the government research agenda. At the same time, farmers have been reluctant to fully exploit available technologies, especially due to their high labour requirements. Weak extension services and input delivery systems have also limited the dissemination and adoption of improved technologies and appropriate agronomic practices by vegetable growing households. Not surprisingly, productivity remains very low (Ali and Tsou, 1997; Mahmud *et al.*, 2000).

Third, the fact that vegetables are generally characterised by high yield and output variability, especially when compared to foodgrains, has also restrained farmers from scaling-up production (Ali and Tsou, 1997). Most vegetable crops are sensitive to adverse weather conditions and vulnerable to pests and diseases.

Finally, but certainly not least, price volatility and product perishability make vegetable marketing a risky venture (Ali and Tsou, 1997; Ateng, 1998; Mahmud *et al.*, 2000). On the

one hand, wide inter-annual variations in vegetable prices make it difficult for farmers to predict future returns at the time of planting. On the other hand, in the short-term farmers cannot shield themselves against adverse price shifts by increasing consumption and/or postponing sales. Storage is not an option for most vegetable crops.

The slow growth in vegetable production is rather unfortunate, not only because of its nutritional implications, but also because of lost employment and income opportunities. Unless current constraints and risks in vegetable cultivation and marketing are simultaneously addressed, the existing production potential will remain largely untapped and current nutrient deficiencies amongst the population will persist.

4.3 Vegetable consumption in Bangladesh

In Bangladesh most vegetables are consumed as condiments. Demand has been growing over the past two decades as a result of population growth, rising incomes, and rapid urbanisation. Yet, during that same period production increased just enough to compensate for the growth in population, and annual per capita consumption has stagnated around 10 kilograms as a result (Ali and Tsou, 1997). These levels are half of those achieved in the 1950s and less than 15 percent of minimum consumption requirements (Talukder *et al.*, 1993). The negative nutritional and health implications of this situation are obvious.

National consumption averages tend to hide significant temporal, regional, gender and other differences. Vegetable consumption varies widely throughout the year, according to the seasonal availability of supplies. Moreover, urban households enjoy on average higher vegetable intake levels than their rural counterparts. In addition, consumption is quite sensitive to income, with poor households eating considerably less vegetables than richer ones. Finally, the national consumption average says nothing about the distribution within the household, i.e. between men and women and adults and children. It is likely that both women and children are at a disadvantage in terms of the amount of vegetables consumed.

Demand for vegetables will continue to grow in the future. However, in the absence of major imports, consumption growth will depend on farmers' interest and capacity to expand production. Improvements in vegetable marketing will prove crucial. On the one hand, without increased and more stable farm-gate prices and enhanced marketing opportunities, producers will have few incentives to invest scarce time and resources in vegetable cultivation. On the other hand, without a better functioning marketing system, households in deficit regions will carry on facing a situation of limited and expensive vegetable supplies.

4.4 Vegetable exports

Bangladesh enjoys a comparative advantage in vegetable production, thereby having the potential to export significant quantities of fresh produce to international markets at competitive prices (Ateng, 1998, Dasgupta, 1998; Mahmud *et al.*, 2000). The country is in a particularly good position to supply high-value vegetables to markets in Europe and the Middle East during the winter months. Southeast and East Asian markets offer good export opportunities as well. This potential notwithstanding, vegetable exports are negligible and reached a low 10,270 tons in 1999-2000 (Hortex, 2001).

Most exporters target South Asian communities in the United Kingdom (UK) and the Middle East, relying on informal contacts with local agents in those markets. Fresh vegetables are collected by exporters in large wholesale markets in Dhaka and specialised production zones in Jessore, Dhaka, Comilla and Chittagong districts. Handling and transport practices are rarely adequate, and the product frequently changes several hands before reaching its destination market. Not surprisingly, quality at the port of arrival is generally low and so is the price fetched.

The government attaches great importance to the development of vegetable exports as a means to increase foreign exchange revenues, generate employment, improve farmer incomes, and diversify agriculture. In 1993 it established the Horticultural Export Development Foundation (Hortex Foundation), a non-profit association which has the mandate to promote non-traditional horticultural exports to high-value markets. Hortex initiated activities in 1996 with financial support from the World Bank. Since then, and amongst other activities, it has been promoting the concept of export-oriented contract farming schemes and offering assistance to investors interested in following this model (Hortex, 2001).

Contract growing is seen as critical for successful export development due to the highly demanding and selective nature of high-value foreign markets. Exporters must be able to supply clients with regular and consistent supplies of superior quality produce. This requires tight control and rigorous management of the supply chain. Farmers must grow the right variety, follow appropriate agronomic practices, plant and harvest at specific dates, and carefully transport production to local collection centres. The vegetables must then be sorted, graded, and packed according to international standards before transport to Dhaka International Airport, from where they will be shipped to terminal markets. Proper cooling during transport is essential to guarantee that the produce arrives fresh at the port of destination.

So far, only the Bangladesh Rural Advancement Committee (BRAC) has seriously embarked on export-oriented vegetable production under contract farming arrangements. The programme started in 1998 in Comilla and is soon expanding to Dinajpur. Approximately 600 farming households are presently involved in the programme. BRAC provides training and extension advice to these farmers, ensures timely seed and fertiliser supplies, and guarantees a fixed and attractive price at the time of planting. The export programme comprises crops such as french beans, green chillies, bitter melon, kantola, long yard beans, broccoli, bottle gourd and okra. Export volumes have increased rapidly over the past three years and further growth is expected in the coming years. In 2000, a total of 300 tons were sold to Europe (England, France, Belgium and the Netherlands), East Asia (e.g. Singapore) and the Middle East (e.g. Dubai).

BRAC's experience illustrates the challenges the private sector faces in developing vegetable exports to high-quality, high-price markets. Initial investment costs and working capital needs are very high. The management of transport and logistical systems is complex. Shortage of space for air cargo and flight delays or cancellations are common problems. The development of a reliable network of clients in import countries is a difficult and long-term task. Market risks due to price fluctuations, sub-standard deliveries, and delays in revenue collection can be quite significant. These and other problems explain why private investors have been so reluctant to develop contract farming for vegetable exports. They seem to lack the required financial capacity, expertise, willingness to take risks, and long-term vision.

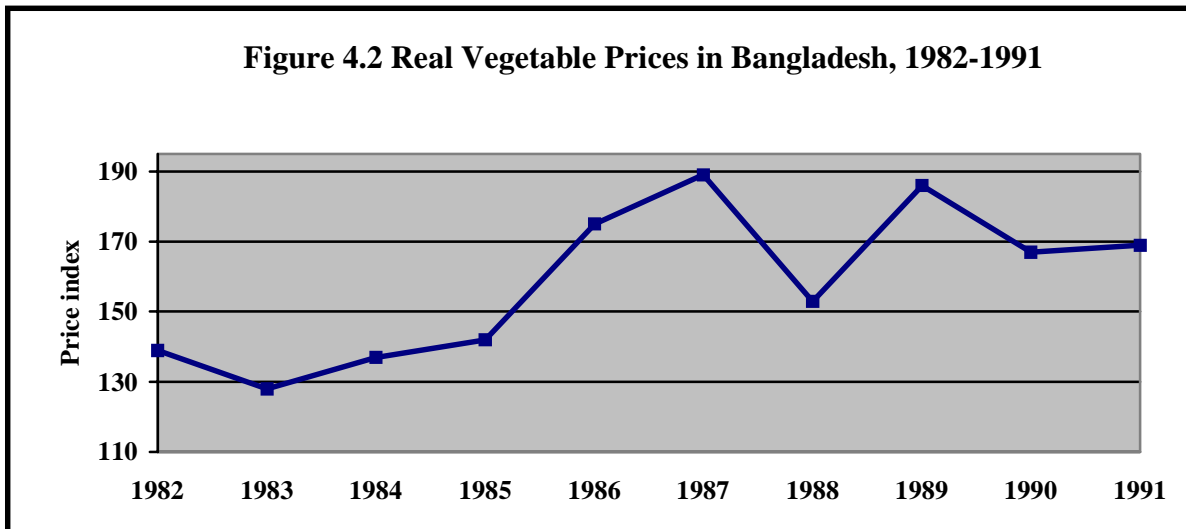
Hortex is also assessing the potential and opportunities for exports of organically grown fresh horticultural produce (Caldas, 2001). This market is expanding rapidly in developed countries, where large segments of the population are willing to pay a significant premium to organic produce. At present, Bangladesh is not an exporter of organic horticultural products. Before it can become one, local producers and exporters must be certified. Consequently, Hortex is currently developing efforts together with some national organisations, such as Proshika, to obtain international certification for their vegetable production. Proshika is developing organic vegetable production near Dhaka, both in its own estate and through contract growers.

Generally speaking, organic vegetable exporters are confronted with similar challenges to exporters that are trying to target foreign markets for high-quality vegetables. In addition, they face the complications of having to go through a process of international certification, which is a difficult one given the lack of internal inspection and certification bodies in Bangladesh. Other problems they will have to face include the lack of in-country expertise and understanding of organic export markets and the unavailability of some organic inputs in the market (Caldas, 2001). The labour-intensive nature of organic vegetable growing also acts as a disincentive for farmers to embark on organic vegetable production.

Finally, the fact that domestic market channels for organic vegetables are practically non-existent, even in Dhaka, is a significant constraint to export development. On the one hand, exporters lack the opportunity to develop production for existing premium markets within the country before venturing into more difficult export markets, where regularity and reliability of supply are important conditions for success. On the other hand, they lack a local high-priced market to fall back into in case foreign clients fail to purchase all production. Proshika is well aware of these problems. Accordingly, it is trying to develop a market in Dhaka through its own organic food sales centre, the operation of a mobile van that targets key city areas, and the establishment of regular supply links to specific department stores. Depending on the success of this strategy, it will then consider targeting outside markets.

4.5 Price trends and behaviour

Real vegetable price data for the 1990s could not be found and it is not possible therefore to determine recent price trends. Less recent data shows that real vegetable prices increased over the 1980s (figure 4.2), which is consistent with the poor growth performance of the sector during that decade. By the early 1990s, real prices were about 20 to 25 percent higher than a decade earlier. It is interesting to note, however, that rising prices did not offer enough of an incentive for increased production. This is not so surprising given the several constraints and risks mentioned in section 4.2.



Source: Ali and Tsou (1997)

Extreme price variations are one of the main risks farmers have to face. Aggregate vegetable prices may differ by 20 percent or more from one year to another (figure 4.2). Inter-annual price variability may be even higher for individual crops. At the same time, prices are also very volatile within the same season, month or even week. For example, according to weekly price data collected in Jessore and Gazipur between the months of March and October 2000, weekly differences of 20 percent or more in farmer brinjal prices were frequent (Hossain and Shievely, 2001).

Such wide fluctuations are problematic since farmers cannot anticipate future prices at the time of planting, when production decisions are taken. Furthermore, because storage possibilities are so limited, vegetable growers do not have much scope for postponing sales to protect themselves against a sudden and unexpected decline in market prices. Finally, even if growers can to some extent manage the timing of sales by anticipating or delaying the harvest and engaging in very short-term storage, the volatile and uncertain market environment makes marketing decisions complex. It is difficult for farmers to anticipate daily or weekly supply-demand balances. The threat of large quantities of produce unexpectedly arriving at the market at the same time, and prices dropping significantly, is real.

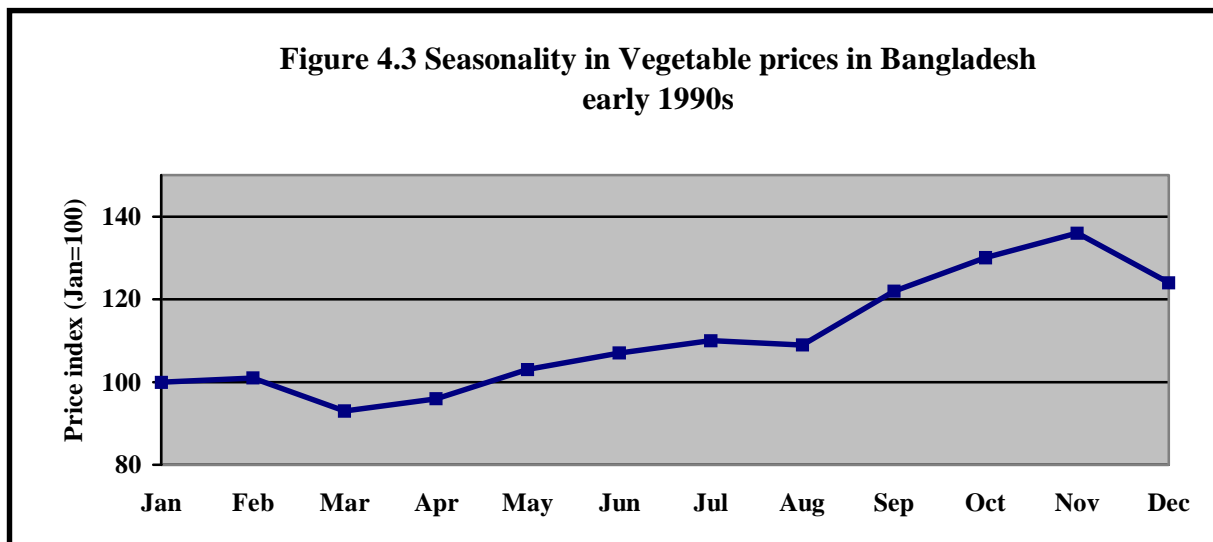
To understand why price changes over time can be so extreme, it is important to consider four aspects:

- One is the fact that vegetable imports and exports are marginal. The impact of abundant domestic supplies on prices could be reduced through exports while at the same time imports could smoothen price rises during times of scarcity.
- A similar reasoning could be applied to surplus and deficit areas within Bangladesh. Exports from the former to the latter are often hampered by distance, poor connections and communications, and the perishable nature of vegetables. Price fluctuations would be smoother if produce flows between surplus and deficit regions were more regular and significant.
- A third aspect that must be taken into account, and one that has been already emphasised,

is the limited scope for storage. With a few exceptions – such as garlic, onions, ash gourd and sweet gourd –, farmers and traders cannot stock vegetables for long. Hence, supplies cannot be transferred from periods of low prices to periods of high prices. If this were possible, temporal price differences would be less drastic.

- Finally, and quite important, large price variations are generally required to restore market equilibrium in situations of excess or insufficient supplies. This can be explained by the thin nature of vegetable markets and the fact that demand is price inelastic. Excess supplies can only be absorbed through large price reductions while in the case of insufficient supplies the market equilibrium is restored through significant price increases.

Unsurprisingly, price variations closely replicate domestic production dynamics, showing a marked seasonal pattern (figure 4.3). Vegetable prices are generally lower during the first semester of the year, when supplies are more abundant, and rise during the second half of the year, as availability declines, peaking around October or November. On the whole, inter-seasonal price differences for vegetables can be as high as 40 or 50 percent.



Source: Ali and Tsou (1997)

However, it is important to stress that seasonal price variations for individual vegetable crops can be even more pronounced. Drawing again on the data collected in Gazipur and Jessore, in October 2000 farmers' selling prices for brinjal were on average 120 and 190 percent higher, respectively, than in July that same year. This data set is particularly interesting in that it illustrates how price patterns for individual vegetable crops may vary markedly from those for vegetables as a whole. Another interesting feature is that it reveals significant differences across regions. The implications are that marketing interventions in a particular area must be informed by crop-specific price information for that same area. Aggregate national averages can highlight trends and patterns, but may fail to accurately reflect what is happening in different parts of the country and for different crops.

Finally, it is important to highlight the impact of quality on vegetable prices. Freshness is a particularly important quality attribute, and more so in the case of extended product chains, which involve many intermediaries and long distances between the point of production and the point of consumption. A low level of insect infestation is another very important quality

aspect, and one that also has a major impact on market prices. Finally, prices are influenced by the size, shape and colour of vegetables.

4.6 The vegetable sector in Go-Interfish areas

Northwest Bangladesh is an important vegetable growing region. It benefits from appropriate soil and climatic conditions for vegetable cultivation and possesses large portions of medium to high elevation land, where summer vegetables can be safely grown. Transport difficulties to major consumption centres and deficit areas in the South and Southeast of Bangladesh have constrained the development of vegetable production in the region, but the situation has improved considerably following the recent opening of the Jamuna Bridge, which has significantly reduced transport costs and time.

During peak harvesting periods, Go-Interfish areas as a whole produce a significant exportable surplus, supplying vegetables to Barisal, Chittagong, Dhaka, Khulna, and Sylhet divisions. However, the picture is far from homogeneous. Some thanas and districts within Go-Interfish project area show much higher production levels than others, and inter-district transactions are therefore significant. Rangpur stands out in terms of vegetable production and as a source of supplies to neighbouring and distant districts, including Dhaka City. Imports from outside areas, such as Bogra and Jessore, are also common, especially during off-season periods. Bogra is in a particularly favourable position to supply vegetables to Go-Interfish areas due to proximity and the fact that some vegetable crops are normally harvested earlier than in Go-Interfish districts.

4.7 Vegetable markets

Vegetable markets in Go-Interfish areas can be classified into village retail markets (*hat*), town retail and wholesale markets (*bazaar*), and primary assembly markets. Each of these market categories has particular features with respect to location, periodicity and seasonality, functions, and number and type of traders. They can be characterised as follows:

- Village retail markets (*hat*). Many small and by-weekly *hat* markets can be found in rural areas. Vegetables are sold in these markets to rural consumers living in their vicinity. Apart from vegetable retailers, who deal with a wide variety of horticultural products, farmers also come to the *hat* to sell their vegetables to consumers. *Hat* markets may open in the morning, afternoon or early evening.
- Urban retail markets (*bazaar*). Thana or district town *bazaars* open six days of the week. They are much larger in scale than village markets, comprising many vegetable traders and serving a significant urban and sub-urban population. Town *bazaars* also function as wholesale markets, supplying vegetables to nearby rural markets and other urban markets in the region. Sales to distant markets may also take place, but are less common. Wholesalers and retailers in the larger *bazaar* markets may have their respective associations, which intervene to mediate conflicts and provide financial support to members in such cases as death of a relative or disease. Cases were found where fees and other amounts collected from members were also used as a revolving fund for short-term credit provision.

- Primary assembly markets. Vegetable assembly markets can be found in higher production areas, where large quantities of produce are collected by primary wholesalers or large itinerant traders before being sent to secondary wholesale and retail markets in distant deficit areas. Some produce may also be channelled to nearby rural and town markets. While wholesalers have fixed premises, itinerant traders need to come to the assembly market to buy vegetables from farmers or smaller itinerant traders. These markets may be located within or near a large town, in a village, or along an important road. Some assembly markets may be independent and involve horticultural products only, whereas others are attached or within the confinements of rural and urban retail markets, where a large variety of commodities are bought and sold. Fresh produce can be brought to primary markets on a daily basis.

4.8 Marketing options and channels

Despite small production volumes, most Go-Interfish vegetable growers have a marketable surplus. Survey data collected in 2000 from 277 project households indicate that, on average, each produces 147 kilograms of winter vegetables and 122 kilograms of summer vegetables (CARE 2001). Bitter gourd and snake gourd stand out amongst winter vegetables, while country bean and bottle gourd are the most commonly grown summer vegetables. In both seasons, an average of approximately 35 percent of total household production is marketed. The marketing share is likely to increase alongside rising production levels, as households find it difficult to spread consumption over a reasonable time period due to the perishable nature of vegetables, having therefore to sell a significant part of their harvest to prevent spoilage.

Vegetable farming households engage in a series of post-harvest operations. Once harvested, the vegetables are washed and cleaned. The higher quality produce is normally selected for sale. Grading according to product size or condition is undertaken if that is thought to lead to higher prices. Some vegetables are bundled and tied with a rope. Vegetables are normally taken to the market in jute bags or bamboo baskets by foot, bicycle, rickshaw van, tempo, power trolley, and bus. Women are heavily involved in post-harvest activities up to transport to the market.

Households have various marketing options, both in terms of market outlets and with respect to the type of buyer. These different options are described and discussed below:

1. Farm-gate sales to neighbouring households.

Sales to village residents are sometimes an option when the farming household has very small quantities of vegetables for sale (say five kilograms). Time is saved marketing the vegetables and the farmer incurs no transport cost. Prices may be attractive due to the absence of intermediaries, but poor purchasing power and/or close relations between seller and buyer often result in relatively low prices. Furthermore, during peak marketing periods farmers are often unable to sell even marginal quantities of vegetables to village residents, as the whole area may have significant surplus production. They must then rely on other alternatives.

2. Farm-gate sales to traders.

Homestead sales to traders are very common and convenient since no time and money is spent going to the market. When selling at the village, the farmer also avoids exposure to adverse and unforeseen price fluctuations in the market place. Cash sales are the norm, irrespective of the buyer. The option of selling at the farm gate is generally favoured by farming households who have limited amounts of vegetables to sell, lacking the incentives to take their produce to the market, and by those who are busy with other important and sometimes more remunerative activities, having no available time to spend going to the market. Many Go-Interfish end-clients fit into these two categories.

The option of selling at the farm-gate entails a significant price discount. Traders tend to pay low prices due to the time spent and the costs incurred procuring small volumes from individual vegetable growers. The fact that traders are usually much better informed than farmers about the market situation also contributes to such situation. Indeed, selling at the homestead is a sub-optimal marketing strategy not only because the price fetched is well below the price that could be obtained in the market, but also because this option implies that growers have limited exposure to market information. As a result, farmers do not enjoy the opportunity to learn about markets, being unable to adjust their marketing strategies accordingly and in a weak bargaining position vis-à-vis vegetable traders.

Most purchases at the village level are undertaken by itinerant traders (*faria* and *bepari*) and village market retailers (*hat pikar*). In addition, wholesalers (*aratdar*) and town market retailers (*bazaar pikar*) sometimes buy vegetables at the farm-gate. Volumes purchased from individual farmers at the village level vary, but rarely exceed two maunds. The main motivations behind farm-gate purchases are low prices, product freshness, and the need to secure supplies.

3. Sales at village retail markets.

Many vegetable growers, including Go-Interfish participants, channel part of their vegetable harvest to nearby rural markets. One of the reasons is that a better price can be obtained in these markets than at the homestead. The presence of a reasonable number of buyers, proximity to the village, and the opportunity to purchase a variety of goods are additional reasons why so many vegetable growers choose to sell at the *hat*. In so doing, farmers normally face two options. They can either supply village market retailers or sell directly to consumers, having for that to pay a small market fee (between 2 and 3 Tk). The latter option implies higher prices, but the choice ultimately depends on the amount of produce for sale and the time available.

In addition to purchasing from farmers and small itinerant traders, many *hat pikar* also buy vegetables at town *bazaars*. Local unavailability may force retailers to look for vegetables outside their immediate area of operation. Furthermore, while spot payment is the norm in village market transactions, retailers may be able to secure supplies on credit from *bazaar* commission agents and wholesalers. Finally, it is important to note that procuring vegetables at the town market is a natural option for those *hat pikar* who also sell to consumers at the *bazaar*. This is not so uncommon.

4. Sales at the town bazaar

Generally, sales at thana and district town markets command a higher price than at village markets. Towns congregate a large population which does not produce any vegetables but has some purchasing power to buy them in the market. Competition for supplies is also more intense in town markets given the high concentration of traders and the fact that vegetables are sometimes sold through a competitive auctioning process.

Despite more favourable prices at the town *bazaar*, most farmers prefer to sell at the homestead or in a neighbouring rural market. The increased income made from sales to *bazaar* traders may not justify the additional transport cost and/or time spent travelling to the market, especially if farmers attach a significant opportunity cost to their labour, which is often the case. Lack of exposure to, and knowledge about, urban markets may also discourage some farmers from choosing this marketing option.

As a result, *bazaar* markets are normally supplied by local and outside itinerant traders and *aratdar*. Relatively large vegetable growers may also opt for selling at the town *bazaar* to take advantage of better prices and higher market absorption capacity. In addition, small farmers that live close to town may come to the *bazaar* to buy and sell a variety of products, including vegetables.

Bazaar suppliers have the option of selling to market *pikar* or *aratdar*. The latter sometimes auction the vegetables on behalf of the supplier. Other times they buy the produce for sale to urban and rural retailers or to *aratdar* from other town *bazaars* in the region. Farmers enjoy higher prices when selling directly to town market retailers, but this may not be in their interest since *pikar* face acute cash constraints, often purchasing their supplies on credit. This implies that the farmer must visit again the market to collect payment, and repeat the visit if payment is delayed. A high degree of trust must exist between the farmer and the retailer. In contrast, the *aratdar* always pays cash and may sell to retailers on credit. He may then sell on credit to retailers.

5. Sales to primary assembly markets

Sales to *beparies* or *aratdars* in primary assembly markets are an option available to farmers living in surrounding areas. This is also a common market outlet for the produce bought by *faria* at the farm-gate. Assembly markets benefit from the presence of large traders, who buy significant quantities of produce throughout the week to supply large and distant urban centres or urban markets within Go-Interfish project areas. These markets play an important role during the peak marketing season, diverting large volumes of fresh produce to outside areas.

The above discussion regarding the price paid for farmers' produce in different markets is illustrated with data collected during fieldwork. Table 4.1 presents prices for four different vegetables in various village *hats*, primary assembly markets, and town *bazaars* in Go-Interfish areas²³. The data clearly shows that, within each district, farmer prices are generally highest in district town markets and lowest in village markets. Another feature worth highlighting are the significant inter-district price differences for certain vegetable crops.

²³ The prices in rural and urban markets are those paid by market retailers.

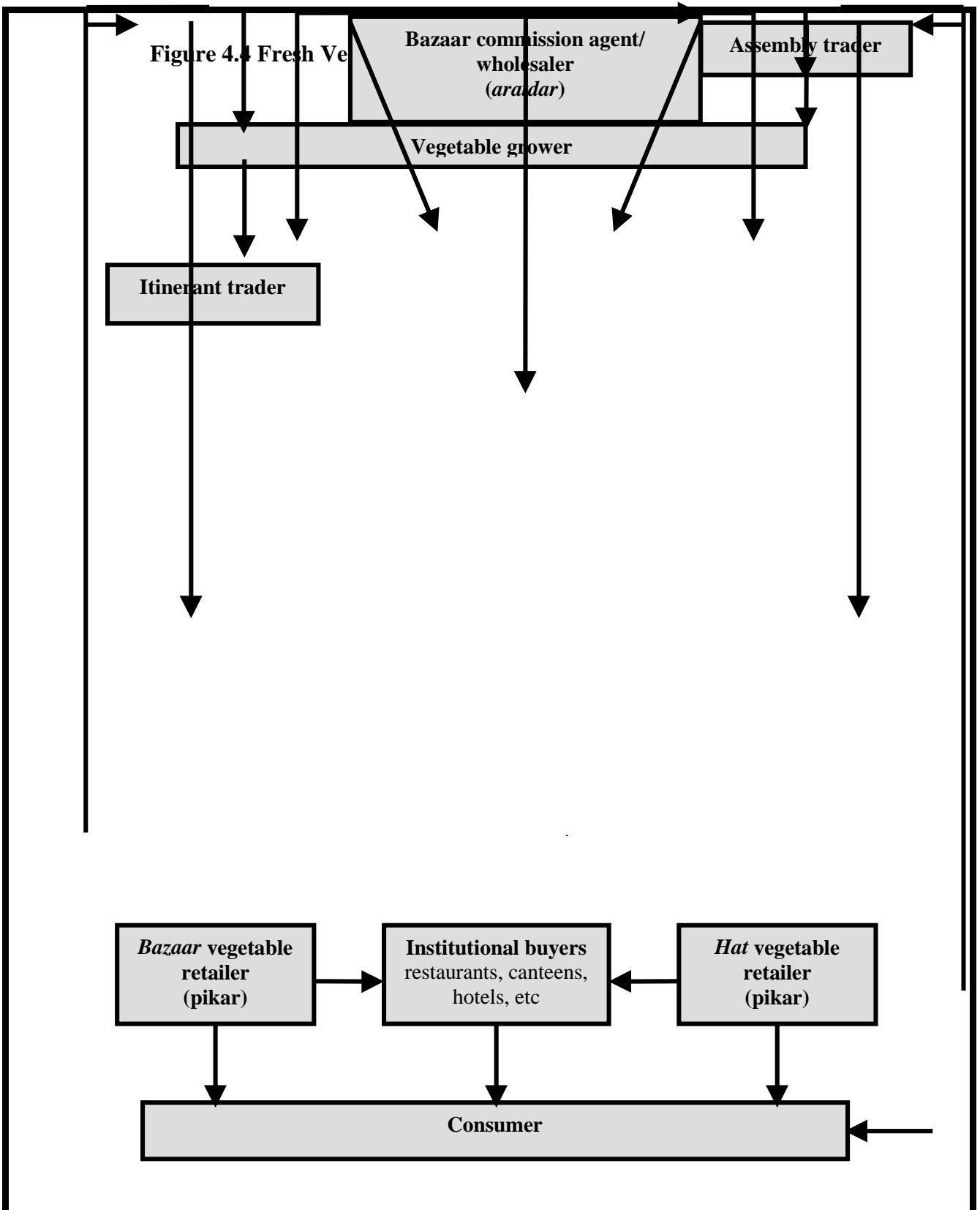
Table 4.1 Farmer prices in different markets in Go-Interfish areas

	Bitter gourd	Snake gourd	Sweet gourd	Okra
Tk per kg				
Dinajpur District				
Okrabari Hat, Chirirbandar	3	4	2.5	n.a.
Binnakuri wholesale mkt, Chirirbandar	7-7.5	3	2.5	2.5
New Parbatipur Bazaar, Parbatipur	6-8	3	3	4
Bahadar Bazaar, Dinajpur	9-10	5-6	3	3
Kurigram				
Nazim Kha Hat, Rajarhat	7.5	5.5	1	5
Rajarhat Bazaar, Rajarhat	6-8	3-4	2	4
Rangpur				
Boiragigonj Bus Stand wholesale mkt, Mithapukur	7.5	2.5-3.75	*	3.3-3.75
Boldipukur Bus Stand wholesale mkt, Mithapukur	6.5	3	*	n.a.
Pauro Bazaar, Rangpur	6	4	*	4
Thakurgaon				
Sakoa Hat, Thakurgaon Sadar Thana	3-4	3-4	1	3-4
Boda Bazaar, Boda	3-4	3-4	0.5-1	3-4
Kalibari Bazaar, Thakurgaon	3-5	4-5	0.75-1	4-5

* Prices set per piece

Source: Price survey, June 2001

Figure 4.4 shows the main local marketing chains for vegetables. Product flows to distant markets are not represented. Several intermediaries can often be found between the producer and consumer, even when vegetables are sold within relatively confined geographical areas. Vegetables may change hands four or five times before reaching the consumer when channelled to distant markets. For example, wholesalers in Rangpur sell vegetables to wholesalers in Dhaka, who then resell the vegetables to local retailers or traders from other parts of the country, such as Barisal, Chittagong and Khulna. In the latter scenario, the vegetables are subsequently purchased by a retailer. Such long product chains are a major source of inefficiency of marketing systems in Bangladesh, since they lead to high quality losses and result in low producer prices.



4.9 Marketing margins

Calculating marketing margins and the share of retail prices commanded by farmers is a difficult exercise. There are many different product chains and marketing scenarios. At the same time, it is difficult to trace the product from the farmer to the retailer, and the respective purchasing and selling prices for every player in the chain, since the latter frequently operate in distinct and distant market areas. Furthermore, prices and margins vary widely within the same week or month and between geographical areas, markets, traders, and crops. Such disparities make sweeping generalisations difficult and dangerous. These considerations aside, an analysis of price data collected from different markets within Go-Interfish project areas in late June allows us to reach certain relevant conclusions and gain a better understanding of vegetable marketing systems in the region.

One of the most striking features of vegetable marketing systems in Go-Interfish areas is that traders tend to operate with very high margins. Individual trader margins of 50 percent or more are not uncommon. In practice, this implies that the farmer is being deprived of a considerable share of the retail price. This problem is most acute the larger the number of market intermediaries and the longer the distances between the point of production and consumption centres. Long marketing chains and high trading margins point to inefficiencies in the marketing system, hurting producers and consumers alike. Clearly, a reduction of the number of intermediaries and the spread between their purchasing and selling prices would raise farm-gate prices, providing an incentive for increased production, while at the same time lowering retail prices, leading to rising consumption and an expansion of market size.

High margins may in part reflect the weak bargaining position of farmers, who may lack sufficient market information and need to dispose of their vegetables as quickly as possible to avoid spoilage. At the same time, however, it must be acknowledged that high margins are not necessarily an indication that markets are not competitive. Although the possibility of collusion amongst traders cannot be entirely dismissed, farmers enjoy different marketing options, which in itself is an important element of competition. If an itinerant trader pays unfairly low prices, farmers generally have the option of selling at the farm gate to a different trader or at a nearby village or town market. Similarly, if prices paid in a particular rural market are too low compared to those in neighbouring *hats*, producers may choose to divert their supplies to these other markets.

Moreover, competition for farmers' produce cannot be assessed only in terms of the number of alternative market outlets within a relatively circumscribed area. The number of traders in a particular market is an equally important determinant of market competition. During fieldwork, a large number of traders was found operating in the same market and competing amongst each other for supplies as well as clients. For example, a small rural periodic market normally comprises more than 10 or 15 vegetable retailers. Farmers also sit at these markets to sell directly to consumers. Assembly markets vary in size and number of traders, but generally accommodate more than 10 wholesalers and a significant and variable number of large itinerant traders, all competing for vegetables brought to the market. Finally, many town *bazaar* markets may lodge more than 20 vegetable *aratdars* and 200 vegetable *pikar*.

Hence, one must turn our attention to other factors to fully understand why vegetable trading margins are so high:

- One reason is that traders, especially *faria* and *pikar*, handle very small product volumes. To earn a minimum target income that justifies the time and effort put into vegetable marketing, these traders must impute a reasonable mark-up to the price paid for the produce.
- Another equally important factor is risk. Vegetable trading is a risky venture in view of extreme price volatility. Prices in the destination market may be well below expectations due to the sudden arrival of large and unforeseen product supplies. Traders are therefore conservative with regards to the prices they are willing to pay for their vegetables. While this may lead to high profit margins, in some occasions losses may be made.
- Vegetable marketing is also very risky because of the perishable and delicate nature of most vegetable crops, which require careful post-harvest handling. Product losses before, during, and after transportation are common and sometimes quite significant. The larger the number of market intermediaries the higher the losses. Spoilage is also positively correlated to distances between different points along the product chain. Traders must account for these losses when setting their margins.
- Finally, high marketing margins are not necessarily synonym of high profit margins. Traders' variable and fixed costs must be taken into account. Very small traders face low operational costs, but also handle modest volumes. Time and transport are normally the most significant cost elements. Market fees and jute bags are other additional costs. Larger traders operate within wider geographical areas and often have to organise the transport to distant areas, being also responsible for unloading operations at the market of destination. They generally hire several workers to carry out purchases at the farm and market. These workers are moreover responsible for piling, sorting and grading, weighing, bagging, and loading the vegetables. Rent has to be paid for fixed premises. Jute bags must be purchased on a regular basis. Market fees, telephone and electricity bills, and entertainment expenditures are also incurred, and visits to distant clients undertaken one or twice every year.

Two cases are presented below to illustrate the discussion. Table 4.1 shows trading margins for Safiqul Islam, a vegetable *pikar* that sits at Kaliala *hat*, in Chirirbandar thana, some 20 kilometres distance from Dinajpur town. Apart from selling twice a week at the *hat*, Mr. Islam also markets his vegetables at Bahadur Bazaar, in Dinajpur. No workers are hired to assist him with his business. Most supplies are procured from farmers in surrounding villages and at the village market. Purchases from farmers at Binnakuri wholesale market, 8 kilometres away from Kalitala *hat*, are also frequent. The vegetables are normally transported by bicycle, but a rickshaw van is sometimes hired to transport the fresh produce. During peak marketing periods, Mr. Islam trades approximately 3 maunds of vegetables per day. During off-season periods, he markets on average one maund.

Table 4.1 Marketing margins at Kaliala Hat, Chirirbandar, Dinajpur

	Bitter gourd	Okra	Brinjal	Long yard bean
1. Farmer selling price (market)	4	2.5	4	4
2. Retailer selling price	10	4	6	8
3. Retailer margin	6	1.5	2	4
4. Retailer margin (%)	60%	38%	33%	50%
5. Farmer's share of retail price	40%	62%	67%	50%

Source: Price survey, June 2001

Table 4.2 presents the case of Hossen Ali, a vegetable retailer at Pauro Bazaar, in Rangpur town. He buys vegetables at the market from farmers, *faria* and *beparies* through a commission agent. Sometimes he buys directly from farmers. He sells to consumers and institutional clients such as restaurants and hotels. Mr. Ali sells between three and four maunds of vegetables per day in the high season, and less than half of that during the remaining three or four months. Mr. Ali employs no assistant workers.

Table 4.2 Marketing margins, Pauro Bazaar, Rangpur

	Bitter gourd	Snake gourd	Okra	Brinjal	Long yard bean	Tomato
	Tk per kg					
1. Farmer selling price (bazaar)	4.75	3.75	3.75	9.75	5.75	10.70
2. Aratdar commission	0.25	0.25	0.25	0.25	0.25	0.30
3. Retailer purchasing price	5	4	4	10	6	11
4. Retailer selling price	5.50	6	6	12	8	16
5. Retailer margin	0.50	2	2	2	2	5
6. Retailer margin (%)	10%	33%	33%	17%	25%	31%
7. Farmer share of retail price (%)	86%	63%	63%	81%	72%	67%

Source: Price survey, June 2001

These two examples are very simple, since in both of them farmers take their vegetables to the market, where they are sold to local consumers. Much more complicated scenarios could be constructed, involving more intermediaries and inter-regional transactions. However, such simple examples suffice to show that trader margins are high, even when the produce is consumed locally instead of being taken to a distant market. The two examples also confirm that rural retailers enjoy much higher margins than their urban counterparts. The main explanation for such a difference lies in the fact that competition is more intense in town *bazaars*. It is possible that other factors may also play a role, but without further research it is difficult to identify these factors and how they may influence margins.

4.10 Key marketing problems and constraints

4.10.1 Problems and constraints faced by traders

i. Product perishability

Product perishability is one of the main constraints that vegetable traders face, especially during periods of abundant supplies. In one way or the other, this aspect was highlighted during almost every informal discussion. For example, wholesalers and large itinerant traders are particularly concerned with adverse weather conditions and traffic congestion while supplies are on their route to other markets. They are also very concerned with *hartal* periods, during which goods cannot be conveyed to distant areas. Some mentioned, moreover, that trucks are not always immediately available, especially during the peak paddy marketing seasons, around May and December, when demand for transport is higher. Exposure to rain

and sun, and delays during transportation, are a matter of concern since they lead to product and financial losses.

Vegetable retailers deal with smaller quantities of produce and do not sell to distant areas. As a result, they face less severe spoilage risks. Still, during days of heavy rain, consumers do not come to the market and inventories may accumulate as a result. If excessive supplies suddenly arrive at the market, retailers may have difficulties in disposing of all their vegetables. Unsold inventories may then have to be disposed of at a discount to prevent spoilage. Because of inadequate market infrastructure, vegetables are normally sold in poor hygienic conditions, being in direct contact with the sun or the rain and all sorts of contaminants. This accelerates product losses and negatively affects retail prices.

The problem of perishability is more acute the larger the number of market intermediaries and the longer the distances between the point of production and terminal retail markets. Sometimes vegetables have to be transported over long distances and may change hands five or six times before reaching the consumer. At different stages, the product has to be unloaded, weighed, assembled, and loaded again. These factors result in product quality losses and spoilage.

ii. Lack of storage facilities

Many wholesalers and large itinerant traders mentioned lack of adequate storage facilities as a problem. Although most vegetables cannot be stored for more than a few days, wholesalers need to keep them under appropriate conditions when they are being assembled for subsequent transport to other markets. Some inventory accumulation may also occur due to lack of immediate buyers. However, traders often lack the space and the facilities to deposit the vegetables. Exposure to heat, sun, rain and flies leads to unnecessary product losses.

Many interviewed traders stated that they are not in a position to invest in improved storage facilities due to the lack of own capital and difficult access to credit. At the same time, in many cases the required investment may not be financially justified, as the associated infrastructure and maintenance costs may exceed the additional revenues generated over time through sales of higher quality produce. Traders would have greater incentives to invest in storage facilities if vegetables were not perishable, enabling them to exploit temporal price arbitrage opportunities.

iii. Excessive price volatility

Not only do traders face the risk of product spoilage, but they are also confronted with excessive price volatility. They operate in an uncertain market environment, having to undertake purchases and offer prices without knowing exactly what the price will be in the market of destination. Because large numbers of sellers from very different locations converge to the same market, co-ordination amongst traders is difficult if not impossible. The risk of excessive supplies being offered at the same time, and prices dropping below expected levels, is therefore real. The opposite may also happen, with profitable opportunities due to unanticipated high prices being missed.

4.10.2 Problems and constraints faced by Go-Interfish farmers

i. Inadequate seed supplies

During field discussions, many vegetable growers complained about the unreliability of supply and the deficient quality of purchased seed. Supply is inconsistent and certain varieties are simply not available in the market. Poor germination rates are a common problem. Interviews with knowledgeable observers in government and the private sector, and research recently conducted in Jessore and Rangpur (Shirin, 1999), in the context of CARE's Interfish project, suggests that these problems are endemic and affect all classes of farmers.

Untimely deliveries and poor seed quality are problematic in that they unduly expose farmers to production risks and result in lower yields. Production decisions are also constrained by the unavailability of certain varieties. From a marketing perspective, such problems affect product quality and limit the ability of growers to spread vegetable cultivation over time and exploit off-season opportunities. The negative price and income implications are obvious.

Apart from seed grown by themselves, most Go-Interfish participants purchase seed from neighbouring farmers and *hat* traders. Seed is sometimes bought at the village shop, which has the advantage of being more accessible to women than the village market. However, vegetable seed is seldom available at these shops. Some Go-Interfish farmers buy seed from thana town dealers, but few purchase directly from district distributors due to distance.

Town dealers operate simultaneously as wholesalers and retailers, selling seed in bulk and small packets. The latter are offered at 10 to 20 percent higher price. Sales on credit to known and reliable clients are commonly practised. Seed distributors and dealers obtain seed from various sources, including the Bangladesh Agricultural Development Corporation (BADC), NGOs such as BRAC and the Grameen Krishi Foundation, national and international seed companies, contract growers, and rural markets. Many claim that they undertake germination tests prior to sale and periodically dry stocked seed, but partial or full compensation to clients for damaged seed is not so uncommon (Shirin, 1999).

Generally, it appears that links between town wholesalers and rural seed markets are weak. Many dealers have limited knowledge of local delivery networks and little awareness of farmer variety requirements and supply needs (Shirin, 1999). This situation can be explained by the geographically dispersed and fragmented nature of seed demand. Also, while many farmers may have unmet needs in terms of specific varieties and delivery times, demand may not be large enough to justify supply. Still, unless supply networks become more demand-driven, quality and delivery problems will persist.

ii. Low prices

During the focused group discussions, vegetable growers were quite vocal about the low prices they receive for their vegetables during peak marketing periods, when large quantities of produce enter the market. Depressed prices are generally perceived as a consequence of too many farmers selling the same vegetable crops at the same time. In a given area, farmers tend to sow and harvest their vegetables around the same period, according to local climatic and soil conditions. Unavailability of appropriate seed for off-season planting and early or late harvesting is another reason why farmers within a certain region tend to follow very

similar production cycles. Because storage possibilities are extremely limited, farmers end up simultaneously selling their surplus production.

It is important to acknowledge, however, that low prices are not only caused by too many supplies being sold at the same time. Produce quality is another important influence on farmer prices. So is the number of intermediaries intervening between the producer and the consumer. Individual growers tend to have relatively small quantities of vegetables for sale, and as a result they lack the incentive to sell further up the marketing chain and to more distant and remunerative markets. Poor access to market information, lack of experience in vegetable trading, and high marketing risks also discourage farmers from pursuing more attractive market channels and outlets.

iii. Excessive price volatility

Like traders, farmers perceive price volatility as problematic. Not only are they unable to postpone sales through storage in situations where the market price drops below normal levels, but they also have difficulties in anticipating future prices and managing the timing of harvesting and sales accordingly. Furthermore, price volatility leads to higher trader margins and results in lower farmer prices. To protect themselves from unexpected and adverse market price changes, traders tend to be conservative in the prices they are willing to pay to farmers.

iv. Product perishability

Farmers see product perishability as a problem because it prevents them from spreading consumption over time and leaves them without the option of choosing when to market their harvest. What is not so often recognised is that the perishable nature of vegetables also increases trading risks and leads to product losses, thereby inflating marketing margins and depressing farmer prices.

The short shelf life of many vegetables makes timely availability of buyers a critically important condition for successful marketing. If the product cannot be sold within a few days, it will rapidly lose market value and may eventually perish. Although market access does not seem to constitute a general problem in Go-Interfish areas, during periods of abundant supplies farmers may at times experience some difficulties in finding immediate buyers for their produce, and vegetables may deteriorate as a result. This problem is more likely to occur in remoter areas.

v. Under-developed marketing channels for pesticide-free vegetables

Go-Interfish farmers lack specific market channels and outlets for pesticide-free vegetables. Wholesale and retail markets do not make a distinction between normal and pesticide-free produce, the two being paid the same price. If anything, the latter faces a competitive disadvantage in the market place because of its less attractive appearance. The implications are that the additional labour effort and time put into pesticide-free vegetable cultivation is not being rewarded by a price premium. Consequently, at the moment the interest of farmers in pursuing such type of vegetable production lies largely on the importance they attach to its positive health implications and the savings made on pesticide purchases.

A combination of demand and supply factors explains why specific market channels for pesticide-free vegetables have yet to develop in Bangladesh. Most consumers are too poor or insufficiently aware of health issues to be willing to pay a premium on pesticide-free vegetables. Without well developed certification systems, it is also difficult for consumers to be certain that the vegetables they are buying contain no pesticide residues. Market traders could easily attach that label to normally grown produce to fetch a higher price. Finally, because markets do not discriminate in favour of pesticide-free vegetables, farmers lack the financial incentive to opt for more organic cultivation methods.

4.11 Opportunities for intervention

4.11.1 Preliminary considerations

Marketing constraints and risks are one of the major impediments for expanded vegetable cultivation in Bangladesh. There is scope for a project to address some of these constraints and risks through carefully designed interventions. Success in this area, measured by sustained improvements in market access and prices, can significantly contribute to increased vegetable production and incomes in project areas.

Several CARE projects have been promoting dike and homestead vegetable production in different parts of Bangladesh. Some have recently implemented specific pilot activities aimed at supporting vegetable marketing by small farmers. The design of vegetable marketing interventions should be preceded by consultations and co-ordination with these projects, which may have valuable experiences and lessons to share. Go-Interfish should learn from these experiences with a view to replicate successful approaches and avoid repeating other that have proved problematic from an effectiveness and sustainability viewpoint.

For example, GOLDA has been trying to develop linkages between clusters of farmers in remote areas and village-level vegetable traders, and between the latter and urban wholesalers, apparently with good results (Abedin *et al.*, 2001). This study also emphasises the importance of market linkage development, although it advocates a more open and flexible approach, which takes more into account the diversity across communities and between households within each community. Linkages with village-level intermediaries may sometimes prove the best route to follow, whereas other times there may be some potential to directly link producers to assembly wholesalers, urban market traders, or institutional clients. Moreover, while support to local entrepreneurs with limited or no experience in vegetable trading is not to be excluded, this study gives preference to a type of linkage development that looks at existing market channels and players and leads to shorter product chains.

Recently, Interfish project has also experimented with group approaches to pesticide-free vegetable marketing in Bogra district (Alam and Begum, 2000). The idea was to develop specific market channels for pesticide-free vegetable at the village, thana, and district town level. Attempts were also made to direct part of the marketable surplus to wholesale markets and institutional clients in Dhaka. A total of 16 Associations, comprising approximately 1,500 farmers were constituted. 156 farmer leaders then formed an umbrella forum, named IKNES, which is responsible for co-ordinating and carrying out vegetable marketing activities on behalf of farmer associations. IKNES has one branch in each of the five thana towns and one central branch in Bogra. Future plans include the opening of a shop at Gulshan Bazaar, in Dhaka.

Although it is probably too early to arrive at solid conclusions, it appears that not enough time was spent consolidating such a heavy and formal marketing structure, which remains largely dependent on project support for the development of future activities. This experience also highlights the difficulties in creating new market channels for pesticide-free produce, and the need for a more cautious and gradual approach. For example, early attempts to directly supply clients in Dhaka City were probably too ambitious and not preceded by sufficient market analysis and linkage development. Financial losses were incurred as a result.

The remainder of this section discusses the following six intervention options to improve the returns from vegetable production to project farmers:

- Development of local seed production and markets.
- Integration of marketing issues (e.g. quality, market information, and off-season strategies) into project extension work.
- Promotion of off-season vegetable production and marketing.
- Support to group marketing activities through training and linkage development.
- Development of market channels for pesticide-free vegetables.
- Link selected project farmers with vegetable exporters.

4.11.2 Improving access to good quality seed

The importance of timely access to quality seed for successful vegetable production and marketing by primary and secondary project beneficiaries cannot be overemphasised. However, seed supply systems in Go-Interfish areas suffer from many weaknesses, and this is a matter of concern to project farmers. Although many of the seed production and marketing problems can only be adequately addressed at a macro level, certification being one of them, there is potential to develop interventions to improve seed availability and quality in project areas. Four intervention options are suggested below for consideration.

1. Train project participants on seed variety and quality assessment issues

During fieldwork, some interviewees mentioned that farmers often lack the required knowledge to assess the variety and quality of the seed purchased in the market, thereby being liable to dishonest practices by seed traders. Farmers may also possess limited information on the varieties available and their respective advantages and disadvantages. For example, certain varieties may perform better than others in terms of resistance to pests and diseases. Also, some varieties may allow for early or late planting while others may have a short maturity period. Adequate knowledge about seed issues is essential if farmers are to reduce their exposure to cultivation risks, produce good quality vegetables, and exploit off-season production and marketing opportunities. Given their importance, vegetable seed management issues should form part of FFS training activities.

2. Support commercial seed production in project areas.

Although advice on vegetable seed production for household utilisation is envisaged by Go-Interfish, the project could at the same time consider the possibility of supporting seed production on a more commercial scale by selected project participants, local entrepreneurs or partner CBOs and NGOs. This type of intervention has the potential not only to address existing accessibility and quality problems, but also to reduce seed retail prices and generate additional income opportunities in project areas. Because of proximity to seed producers, farmers are moreover given the opportunity to observe the seed production process, being in a better position to make informed quality judgements.

Training is an important element in any support package to existing or new vegetable seed producers. Training activities should emphasise technical matters, such as nursery establishment and management, to ensure that produced seed meets minimum quality requirements. Concurrently, business training and market information should be provided to enhance the commercial viability of seed production activities and their responsiveness to the needs of project and other farmers with respect to varieties and timing of supply.

For these same reasons, market links between seed producers and project participants should be promoted. Successful linkage development should not only contribute to improved access to seed, but also have a positive impact on the terms under which seed transactions are conducted, with sales on credit and compensation for sub-standard seed deliveries playing an important role. Finally, seed producers could be linked to credit providers in cases where credit is required for the successful development of seed production and marketing activities.

3. Support seed trading activities at the village level.

As suggested by the Shirin report, Go-Interfish could consider the possibility of assisting village shop keepers interested in becoming involved in seed trading or further developing their existing seed business. The support package should include, amongst other elements, training on seed storage and business practices, regular information on the varieties and quantities required by local project and non-project farmers, and upstream and downstream market linkage development. In addition, the need for linking shop dealers to credit providers should be assessed.

The provision of qualitative and quantitative information on seed demand and the development of linkages with thana or district level seed dealers and project clients are essential to the successful development of local seed supply networks. On the one hand, the intervention will be ineffective and unsustainable unless local seed trading proves commercially viable. On the other hand, from a project perspective, the intervention will only succeed if village shops serve as an effective channel between reputed seed distributors and project farmers. Wholesalers with the capacity and interest in supplying good quality seed according to project client needs must be identified.

Credit plays a critical role in the development of input delivery chains. Small input retailers normally face an acute shortage of working capital, which constrains their ability to purchase inputs. For this reason, most projects that aim to develop input supply chains combine training and linkage development activities with the provision of credit guarantees to allow for credit-in-kind flows from input distributors to rural input stores to develop. Farmers also experience acute liquidity constraints, having difficulties to pay cash for purchased inputs. Ideally, therefore, market linkages should be developed in such a way that trust between

farmers and local shop keepers is conducive to seed supplies on credit. The development of trust and regular transactions at different point in the seed chain should also facilitate the emergence of informal compensation mechanisms for poor quality seed.

The development of a sustainable network of village shops that supply vegetable seed to surrounding areas may be of particular interest to Go-Interfish because many women farmers have access to these shops. A similar approach to the one outlined above could be followed to support village market seed retailers and link them to project participants, but this option would not improve market access by female farmers, who would continue to rely on their husbands to acquire seed. Nevertheless, it would be worth evaluating and considering such option. While support to village shops involves to a certain extent the development of new supply channels, the alternative of working with village seed traders has the advantage of being based upon existing supply networks.

4. Link project farmers and seed dealers at the district and than town level

The promotion of direct linkages between groups of project participants and reputed thana or district seed dealers could also form part of a diversified strategy aimed at addressing seed delivery problems. Effective linkage promotion has the potential to benefit farmers as well as seed distributors. Vegetable growers could gain from improved and cheaper supplies of seed, while distributors could take advantage of new business opportunities. However, their willingness to do so will ultimately depend on the additional demand thus created and the transaction costs involved. Demand must be high enough to justify supply. Co-ordinated farmer group seed purchases and linkages between town seed dealers and local traders and shops could play an important role in overcoming this problem.

4.11.3 Integrating marketing issues in extension messages

There is a very strong case for incorporating marketing-related messages and discussions in the FFS curriculum, linking them with the extension work Go-Interfish is currently developing on the production side. Project participants often have incomplete information on a number of critical issues, and therefore are not in a position to follow optimal production and post-harvest strategies, in accordance to their resources and risk preferences. There is a wide range of options that farmers can choose from, each having different revenue and cost implications and entailing various degrees of risk-taking. These must be assessed and discussed with project participants.

The freshness and quality of marketed vegetables, the timing of sales, and the chosen market outlet were identified as key determinants of farmer prices. Extension for marketing should emphasise these aspects. For example, FFS are an appropriate medium to disseminate improved post-harvest handling, storage, grading and packaging practices with a view to improve the quality of marketed vegetable. Similarly, they are an adequate channel to provide price information to farmers and discuss different crop- and outlet-specific marketing strategies. Similarly, off-season cultivation and trading opportunities, and their potential advantages and risks should be discussed and assessed within the FFS framework.

Cost-benefit exercises could be carried out with the participation of farmers to determine the potential net gains to be made from co-ordinated marketing, direct sales to different terminal or more remunerative markets, off-season cultivation and marketing, etc. These exercises

offer an opportunity to discuss and better understand the constraints project participants face in adopting improved production cum marketing strategies and devise cost-effective solutions to identified problems. These activities could be complemented by exchange visits to expose farmers to successful experiences elsewhere.

A successful integration of marketing into the FFS curriculum will require staff training. For example, vegetable marketing issues may be new to project staff. Moreover, field trainers must have the capacity to transfer analytical skills to Go-Interfish farmers in order to enable them to make informed judgements about different options and carry out independent analyses in the future. Finally, discussions must be fed by information about diverse local market realities and contexts, and field staff must have the necessary skills to monitor markets, collect price data, undertake some analysis, assess opportunities, and pursue them. Market linkage activities may be required, and the staff must be prepared to adequately develop these linkages.

4.11.4 Promoting off-season vegetable marketing

The rationale for promoting off-season vegetable production is twofold. On the one hand, this strategy allows farming households to spread consumption over time, thus having clear nutritional benefits. On the other hand, it enables them to sell their harvest at times when market supplies are scarce, and in so doing, obtain higher prices. Given these advantages, off-season cultivation and marketing opportunities should be given due consideration by Go-Interfish project.

However, while there is clear scope within the project to identify and pursue off-season marketing opportunities, a cautious approach should be followed. First, off-season cultivation is not always technically feasible. All depends on the local agro-climatic conditions and the type of crop. Secondly, this is a strategy that many households may not be willing or able to pursue because of risk and resource considerations. Off-season cultivation entails increased production risks as a result of sub-optimal weather conditions and higher crop susceptibility to disease and pest infestations. It also requires more intensive care and input use, especially labour and water (during the *boro* season). Last, but certainly not least, households willing to follow this option must have access to special seed, including short duration varieties or varieties that yield well when planted early or late during the season.

One of the essential requirements for successful off-season vegetable production is technical know-how. Go-Interfish can play a critical role in disseminating appropriate agronomic practices and technologies amongst end-clients. It can also link project participants to seed dealers and traders with a view to ensure timely and sustainable access to adequate seed. Visits to households who successfully cultivate off-season vegetables could be organised to expose project participants to other farmers' experiences.

Finally, it is important to stress that off-season marketing is not only dependent on early or late harvesting. Appropriate storage practices may in some cases extend the shelf life of vegetables and enable the household to market the produce later than most other growers. If quality can be preserved during that period, the household is in a position to command improved market prices. Simple storage technologies should therefore be identified and disseminated amongst Go-Interfish vegetable farmers.

4.11.5 Group co-operation for vegetable marketing

Vegetable prices in different markets and geographical areas show considerable variation. However, Go-Interfish project participants usually sell their vegetables in the immediate vicinity of the homestead, thereby missing out other more profitable market outlet alternatives. Lack of market information partly explains why most choose to operate within extremely confined market realities. Another more important reason lies in the fact that farmers generally have very small marketable surpluses and face acute time constraints, lacking the incentive to exploit spatial price arbitrage opportunities. Group marketing has the potential to address this problem.

Joint marketing activities not only allow farmers to share transport costs to more distant and lucrative markets, but they also enable them to save time sell their produce, since the actual marketing activities can be carried out by one or two group members only. Less ambitiously, group co-operation can form part of a strategy to improve revenues from farm-gate sales. If sufficiently large quantities of vegetables can be assembled and supplied at once, large traders may have the incentive to come to the village to collect the produce and be willing to pay a premium for the convenience. More so if farmers can deliver fresh and good quality produce, which is a particularly important requirement for traders that supply relatively distant markets.

Initially, groups should develop simple activities, such as bulking up produce for sale at nearby urban markets. Co-ordination of seed purchases is another area with potential to generate mutual benefits. The group can also market vegetables from other village farmers, especially if a certain degree of trust exists between group members and other growers in the community, with the latter being paid after the produce has been sold. This can constitute an additional source of revenue for group farmers. Over time, as trust develops and the group becomes more experienced and confident, it can start supplying increasingly distant and remunerative terminal markets.

Support to group formation and organisation, delivery of business training, provision of market information, and the development of linkages with vegetable buyers are important ingredients of any successful project strategy to promote group marketing. Such activities are especially important during the initial stages, when farmers lack the experience and confidence to operate as a group and the knowledge about markets and marketing is still very incipient. Group development is not a quick fix solution to the problems and constraints that vegetable growers may experience, and it is important that farmer expectations are managed accordingly. It may take a considerable time for successful groups to consolidate and mature.

Co-ordination with vegetable buyers on matters such as crop and quality requirements and the timing of supply are particularly important for improved market access and prices. After some time, traders may be willing to finance the group to undertake purchases from other farmers in the village and surrounding communities, providing group members with an additional source of income. CARE is in a privileged position to play the role of honest broker between farmers and traders, particularly during the initial stages of group development.

It is important to stress, however, that group marketing is rare in Bangladesh. Farmers regard joint marketing ventures with suspicion and tend to follow an extremely individualistic approach to crop selling activities. It is also important to acknowledge that the benefits from

joint vegetable marketing to individual growers may not justify the costs they incur in co-ordinating sales and linking to crop buyers, especially in an environment where trust may be lacking. Indeed, because individual Go-Interfish farming households have very small vegetable surpluses to market, significant unit price gains may still result in modest income gains.

Consequently, in most cases the promotion of group marketing should be based upon a diversified portfolio of crops and activities. These will vary according to group composition, interests, and preferences. For example, as well as jointly marketing their vegetables, farmers may have an interest in co-ordinating sales of aromatic rice, fruits, spices and/or fish. Also, co-operation for input purchases might sometimes prove beneficial.

Marketing groups that specialise in one single commodity function well only when all members have significant produce quantities to market and clear gains can be made by selling together as a group. This is the case of some Go-Interfish farmers in Nosratpur, an Hindu community located some 15 kilometres from Chirirbandar thana headquarters and 27 kilometres from Dinajpur town. Five brothers and some neighbours used to sell their banana production to *faria* and *beparies* at the village level, sometimes on credit. Because they were unhappy with farm-gate prices, they decided to go to Dhaka to check wholesale market prices and establish initial contacts with *aratdars*. Realising that they could obtain a much higher price if they managed to load a whole truck and directly supply Dhaka wholesalers, these farmers decided to assemble their production and sell it in Dhaka.

The group now has contacts with many wholesalers in different markets, including Thakurgaon, Chittagong and Mymensingh. Prices and payment conditions are checked over the phone with several traders before a decision is taken on where to send the produce. Wholesalers also provide information on consumer preferences, for example with respect to product size, and are often responsible for organising and paying transport. If group members are unable to load an entire truck with their own production, they may obtain cash advances from known wholesalers in order to purchase the remainder from other growers. The money is advanced through bank transfer. The better quality produce is sent to distant markets whereas the lower quality is sold at the farm-gate to itinerant traders. Nosratpur has approximately 35 banana growers, half of which now sell as a group.

It is interesting to note that farmers in Nosratpur do not market other commodities as a group. The alleged reasons are that individual marketable surpluses are small and that group sales to distant markets are not sufficiently rewarding. For example, interviewed group members claimed that they face no difficulties in selling paddy in the local *hat* and that the price fetched is similar to that paid in other more distant markets. Because there are no local buyers for aromatic paddy, individual farmers sell their production in Dinajpur, either to traders or directly to mills. Vegetables can be easily sold in the local market, but individual farmers sometimes take their produce to Saidpur.

What is so remarkable about the above case study is that, in an environment where such initiatives are rare, a group of small farmers achieved considerable success in jointly marketing bananas to distant terminal markets without any external support. This and other successful examples of group co-operation for marketing should be disseminated amongst Go-Interfish farmers through cross visits. Farmers would thus have an opportunity to discuss and exchange views with group members, learning about their successes, difficulties, and failures. Visits to different markets could complement these activities.

The above case study offers valuable insight into many of the requirements for successful group activities:

- Leadership and initiative. Farmers took the initiative to visit markets and establish contacts with traders. They also engage in regular market monitoring activities.
- Favourable group dynamics. The fact that five of the group members are brothers and that all share similar values and religious beliefs may help explaining the high degree of trust and cohesion between farmers. All marketing decisions are discussed within the group and serious conflicts have so far been avoided.
- Commonality of interests. All group members grow reasonable quantities of bananas and have an interest in selling to distant terminal markets to benefit from higher prices.
- Simple group rules. The group has no name and membership does not imply any financial contributions. Moreover, group composition varies with every transaction, depending on produce availability and the interest of growers to sell with the group. Complex group functioning rules would discourage participation while offering no tangible benefits.
- Good understanding of markets. Group farmers are well aware of the risks they incur in selling to distant markets, in particular the possibility that prices will be lower than what was initially envisaged due to the sudden arrival of large quantities of produce. They are also reasonably aware of the advantages and disadvantages of different market outlets for a variety of crops, and manage crop marketing accordingly.

4.11.6 Develop market channels for pesticide-free vegetables

There is potential for an organic food premium market to develop in the major urban centres of Bangladesh, particularly in Dhaka. Certain segments of the urban population have significant purchasing power and would be willing to pay a premium for organic products if these were within easy reach. Reputed department stores that target an elite clientele could serve as a privileged market outlet, but for that they would require a major and reliable source of supplies, since certified organic products are not available in markets.

As the IKNES experience shows, the problem Go-Interfish project participants face when trying to market their pesticide-free vegetables is the lack of well established market channels which can absorb such production at a premium price. To circumvent this problem, links with selected elite department stores in large urban centres could be developed; however these outlets require a regular and consistent supply of high-quality produce, a difficult condition for Go-Interfish farmers to satisfy, even if organised in well-functioning associations. Fixed market outlets in wealthier neighbourhoods in these cities could also be established and run by an umbrella farmer organisation, such as IKNES, but at the current stage of organic market development, this is a risky option, and one that requires a considerable degree of management, logistical, and financial capacity.

In view of these considerations, this study proposes a less ambitious strategy. CARE could undertake a market survey to assess the demand for pesticide-free vegetables in thana and district towns located within Go-Interfish project areas, in particular from institutional clients

(e.g. hospitals, schools, government institutions, restaurants, and hotels) and food stores. The price that potential clients would be willing to pay and their requirements in terms of type of vegetables, quantities, quality, and timing and regularity of delivery must also be assessed. Based on this information, CARE could evaluate the benefits from supporting farmer group formation and development and linking these groups to potential clients.

The success of this strategy is ultimately dependent on the size of demand, on the premium customers are willing to pay for pesticide-free vegetables, on the interest of farmers in getting together for vegetable marketing activities, and on their capacity to deliver the required quantities and quality at the right time. If successful, farmer groups could then consider more ambitious marketing strategies. At some point, the development of formal certification mechanisms should be considered, since full market potential cannot be reached based on trust between producers and sellers, and between these and consumers.

4.11.7 Linking farmers to exporters

CARE may want to consider the possibility of linking some Go-Interfish farmers to BRAC's vegetable export programme, which will soon expand to Dinajpur district. In so doing, it must carefully assess the interest of farmers in growing vegetables under contract and its implications for Go-Interfish project. Many project participants may not be in a position to take part in such a scheme due to land and labour constraints. They may also lack the interest to participate due to food security and risk considerations. And it is important to acknowledge that this option falls outside the initial concept of Go-Interfish project.

Nonetheless, some farmers could benefit from a situation in which they have access to adequate support services, secured supplies of quality inputs on credit, and the guarantee of favourable prices. The fact that no marketing risks would be incurred is also worth stressing. To circumvent the potential land availability problem and the understandable reluctance of farmers to overspecialise in vegetable cultivation, CARE could facilitate the formation of producer groups. While the group as a whole could supply reasonable quantities of vegetables to BRAC local collection centres, thereby being in a position to attract the interest of this organisation, individual households would not need to devote a disproportionate share of their resources to vegetable growing and unduly expose themselves to production risks.

ANNEX I

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ANNEX II

TERMS OF REFERENCE

DESIGN AND IMPLEMENTATION OF AN AGRICULTURAL MARKETING PILOT WITHIN THE GO-INTERFISH PROJECT, CARE BANGLADESH

The consultant, under contract to CARE Bangladesh, will provide the following services to assist CARE with the design of marketing initiatives for use in the GO-Interfish project and future CARE projects.

1. Project Title

An analysis of the producer to consumer chain for the following sub-sectors: rice, fish, vegetables (to be identified depending on season) in the operating area of the GO-Interfish project (NW Bangladesh).

2. Background

GO-Interfish aims to effect sustainable improvements in poor farmers' livelihoods by working with them to improve their rice field productivity and diversify their livelihood strategies. While project activities revolve around IPM, dike cropping and rice-fish, the Farmer Field School groups, formed at a village level for extension purposes, offer an ideal entry point for introducing other activities that are of benefit to farmers. By adding additional “non technical” content to the FFS curriculum (problem tree analysis, sub-sector analysis, advocacy, etc), we hope that FFS is transformed into something more than just a school for a particular set of agricultural innovations. A group which is capable of analysing and finding solutions to the constraints encountered in all areas of its members' lives is likely to continue to meet after the withdrawal of CARE's support.

3. Overall Objective

The overall objective of this consultancy is to design and initiate a scheme which will enable the project to implement marketing activities on a pilot basis through selected Farmer Field Schools.

4. Scope of Work

The study can be divided into two of components which require two different sets of skills. They may be conducted by one or more consultants, depending on the skills necessary and available:

- a) **Overall picture.** In order to present an overall picture of the marketing chain in the Northwest, the consultant will conduct sub-sector analyses for a variety of different produce (to be identified at beginning of contract, but likely to include rice, fish and certain vegetables). In all cases the study will be grounded in the context of producers who comprise GO-Interfish's target group. On the basis of the results of these studies, the consultant will identify and recommend ways in

which the target group may be able to adapt or adopt various practices or strategies to benefit from marketing related activities.

- b) **Implementation of recommendations.** The consultant will design and deliver training on how to implement the recommendations made in component “a” to selected project staff. The exact nature of this work will depend on the outcomes of component “a”, but at present it is envisaged that this will be a role for “trainer-of-trainers”. Successful execution of component “b” will lead directly to the introduction of marketing related content to the FFS syllabus or other “in-project” training programmes as required.

5. Expected Outcome and Deliverables

For component “a”:

- Sub-sector analysis reports on the selected sub-sectors
- Recommendations for areas of intervention in the sub-sectors analysed

For component “b”:

- Recommendations for a marketing training strategy GO-Interfish
- Training components and modules which will be used to train project staff and beneficiaries in the concepts and skills needed to successfully implement the recommendations made as an outcome of component “a”
- Delivery of training in key concepts and skills to project staff

6. Competency and Expertise Required

The consultant should be fluent in English. Experience of agricultural sub-sector analysis in a developing world context, rural development, is essential. Previous experience of Bangladesh would be very useful.

7. Conduct of the Work

The study will be largely field based. CARE will make a team of dedicated field assistants available as per consultant’s requirements, as well as interpreters, transport and accommodation as necessary. All project documents will be made available to the consultant.

8. Timeframe

It is expected that the completion of component “a” will take up to one month, and the development of recommendations and training modules as part of component “b” will take a further month. Timing related to the possible delivery of training will be discussed at a later date with the selected consultant.

ANNEX III

LIST OF CONTACTS

Abdur Rahman, Senior Programme Co-ordinator, Fisheries Development Programme, PROSHIKA, Dhaka.

M. Abdus Salam, Co-ordinator, GUK,

Anwarul Islam, Thakurgaon District Fisheries Officer, Ministry of Fisheries.

A. Mannan, SHABGE Project Manager- Partnership, Dinajpur, CARE Bangladesh

Khan Belayet Hossain, Chairman, Bangladesh Fisheries Development Corporation, Dhaka.

Lutfar *Rahaman* Mondal, Co-ordinator, AKOTA

Mahir Uddin Khan, Thakurgaon District Marketing Officer, Department of Agricultural Marketing, Ministry of Agriculture.

Mohemmad Ullah, Thakurgaon District Marketing Investigator, Department of Agricultural Marketing, Ministry of Agriculture.

Shafiqul Islam Dulu, Executive Director, Rokeya Teresa Diana

T. M. Tajul Islam, Senior Agriculturist, Rural development Sector Team, The World Bank, Dhaka.

Syed Abu Motahar, Development Assistance Specialist, USAID, Dhaka.

(...)

ANNEX IV

CHECKLIST – MALE FARMER FOCUS GROUP DISCUSSIONS

1. Approximate proportion of net food buyers/self-sufficient farmers/net food sellers in the village and among project target beneficiaries.
2. Input supply sources and arrangements.
3. Relative importance of different formal and informal sources of credit, and advantages and disadvantages of each.
4. Credit terms and conditions per credit source.
5. Post-harvest practices and activities.
6. Packaging.
7. Seasonality of production.
8. Timing of sales and reasons.
9. Types of buyer per crop.
10. Degree of competition between buyers.
11. Types of transport means used by farmers and/or crop buyers.
12. Negotiation/price setting process.
13. Selling prices and arrangements.
14. Product quality/season and prices.
15. Group activities and dynamics
16. Perceptions on, and ranking of, the main agricultural production and marketing constraints.

ANNEX V

CHECKLIST – FEMALE FARMER FOCUS GROUP DISCUSSIONS

1. Main production activities.
2. Degree of involvement in post-harvest and selling activities.
3. Group activities and dynamics.

ANNEX VI

CHECKLIST - TRADERS

1. Main products and quantities traded by season.
2. Sources of credit and credit arrangements.
3. Where and from whom does the trader buy?
4. Crop purchasing prices and arrangements.
5. Where and to whom does the trader sell?
6. Crop selling prices and arrangements.
7. Degree of market competition.
8. Main marketing costs: transport, storage, product losses, market fees, rent, salaries, interest rates, bribes, etc.
9. Product quality/season and prices.
10. Main business constraints and opportunities.

ANNEX VII

CHECKLIST – RICE MILLERS

1. Processing capacity.
2. Where and from whom does the miller buy paddy?
3. Purchasing prices and arrangements.
4. Where and to whom does the millers sell to?
5. Selling prices and arrangements.
6. Degree of market competition.
7. Paddy and rice quality and price.
8. Price seasonality and prices.
9. Storage practices.
10. Sources of credit and credit arrangements.
11. Main business constraints and opportunities.

ANNEX VIII

QUESTIONNAIRE – PADDY FARMER

1. Name of farmer

2. Village/Thana

3. Distance from village to: Thana headquarters district capital.....

4. Total cultivated land (decimals)

5. Do you sell paddy at the farm-gate? yes..... no.....

(if yes please answer questions 5.1 to 5.4 below)

5.1 Who do you sell paddy to at the farm-gate?

faria.....

bepari.....

aratdar.....

miller.....

5.2 Which quantities (kg) of paddy do you normally sell at the farm-gate?

5.3 Why do you choose to sell paddy at the farm-gate instead of other markets or the miller?.....

5.4 At what price (per maund) do you sell paddy at the farm-gate (most recent transaction)?.....

6. Do you sell paddy at the haat? yes.... no.....

(if yes please answer questions 6.1 to 6.8 below)

6.1 What is the name of the haat?.....

6.2 What is the distance from the village to the haat?.....

6.3 Who do you sell paddy to at the haat?

faria.....

bepari.....

aratdar.....

miller.....

- 6.4 Which quantities (kg) of paddy do you normally sell at the haat?
- 6.5 Why do you choose to sell at the haat instead of the farm-gate or mill gate?
- 6.6 Which means of transport do you normally use to take your paddy to the haat?.....
- 6.7 What is the cost of transport per maund (incl. farmer return trip)?.....
- 6.8 At what price (per maund) do you sell your paddy at the hat (most recent transactions)?.....

7. Do you sell paddy at the mill gate? yes..... no.....

(if yes please answer questions 7.1 to 7.6 below)

- 7.1 What is the distance from the village to the mill?.....
- 7.2 Which quantities (kg) of paddy do you normally sell at the mill gate?.....
- 7.3 Why do you choose to sell paddy at the mill gate instead of the haat or farm-gate?.....
- 7.4 Which means of transport do you normally use to take your paddy to the mill?....
- 7.5 What is the cost of transport per maund (incl. farmer return trip)?
- 7.6 At what price (per maund) do you sell your paddy to the mill (most recent transactions)?.....

QUESTIONNAIRE - PADDY FARIA, BEPARI AND ARATDAR

PADDY MARKET

1. Name of trader.....

2. Category of trader

faria.....

bepari.....

aratdar.....

3. Average quantity of paddy (maunds) traded per market day.....

4. Name of market.....

5. Distance from the paddy market and the case study village.....

6. Do you buy paddy at the farm gate? yes..... no.....

(if yes, please answer questions 6.1 to 6.4 below)

6.1 What quantities of paddy (maunds) do you normally buy from each farmer at the farm-gate?.....

6.2 At what price (per maund) do you purchase paddy at the farm-gate (most recent purchases)?.....

6.3 What are the normal distances from the farm gate to the paddy market?.....

6.4 Which means of transport do you use to bring the paddy from the farm-gate to the market?.....

6.5 What is the average transport cost (per maund) from the farm-gate to the market?.....

6.5 What are the costs other than transport you incur when purchasing from the farm-gate? Please quantify.....

7. Who do you purchase paddy from at the market?

farmer.....

faria.....

bepari.....

8. At what price (per maund) do you purchase paddy at the market (most recent purchases)?.....

9. Where to do you sell your paddy (client location)?.....

10. To whom do you sell your paddy?

mill.....

bepari.....

aratdar.....

11. At what price (per maund) do you sell your paddy for (most recent sales)?.....

12. What costs (per maund) do you incur when selling your paddy (e.g. loading, transport, unloading)? Please quantify.....

QUESTIONNAIRE - MILLER

1. Name.....

2. Distance from the mill to the case study village.....

3. Mill's processing capacity (tonnes of paddy/day).....

4. Do you purchase paddy at the farm-gate? yes..... no.....

(if yes, please answer questions 4.1 to 4.7)

4.1 What quantities of paddy (maunds) do you normally buy from each farmer at the farm-gate?.....

4.2 Why do you choose to purchase paddy at the farm-gate?.....

4.3 At what price (per maund) do you purchase paddy at the farm-gate (most recent purchases)?.....

4.4 What are the normal distances from the mill to the farm-gate?.....

4.5 Which means of transport do you use to bring the paddy from the farm-gate to the mill?.....

4.6 What is the average transport cost (per maund) from the farm-gate to the mill?.....

4.7 What are the costs other than transport you incur when purchasing from the farm-gate? Please quantify.....

5. Do you purchase paddy at paddy markets? yes.... no.....

(if yes please answer questions 5.1 to 5.9 below)

5.1 Name of the markets?.....

5.2 Distance from the markets to the mill?.....

5.3 Which quantities of paddy (maunds) do you normally purchase at the market?.....

5.4 Why do you choose to purchase paddy at the market?.....

5.5 Who do you purchase paddy from at the market?

farmer.....

faria.....

bepari.....

aratdar.....

5.6 At what price (per maund) do you purchase paddy at the market (most recent purchases)?.....

5.7 Which means of transport do you use to bring the paddy from the market to the mill?.....

5.8 What is the average transport cost (per maund) from the market to the mill?.....

5.9 Which costs other than transport do you incur when purchasing from the farm-gate (e.g. labour)? Please quantify (Tk per maund).....

.....

6. Do you purchase paddy at the mill-gate? yes..... no.....

(if yes please answer questions 6.1 to 6.5 below)

6.1 Which quantities of paddy (maunds) do you normally purchase from each seller at the mill?.....

6.2 Who do you purchase paddy from at the mill?

farmer.....

faria.....

bepari.....

aratdar.....

6.3 At what price (per maund) do you purchase paddy at the mill (most recent purchases)?.....

6.4 Where to do you sell your rice (client location)?.....

6.5. To whom do you sell your rice (type of client)?.....

ANNEX IX

QUESTIONNAIRE – FISH FARMER

1. Name of farmer.....
2. Village/Thana
3. Distance from village to: Thana headquarters district capital.....
4. Total cultivated land (decimals)
5. How much do you pay on average to the fishermen per maund of fish harvested?.....

6. Do you sell fish at the farm-gate? yes..... no.....

(if yes please answer questions 6.1 to 6.4 below)

- 6.1 Who do you sell fish to at the farm-gate?

village fish retailer.....
itinerant trader.....
consumer.....
other

- 6.2 Which quantities (kg) of fish do you normally sell at the farm-gate?

- 6.3 Why do you choose to sell at the farm-gate instead of the village or town market?.....

- 6.4 At what price (per kg) do you sell your fish at the farm-gate (most recent transactions)?

Common Carp.....
Tilapia

Silver Carp.....
Indian Major Carp.....
Thai Shatputi.....
Mrigal
Rui.....

7. Do you sell fish at the village market? yes..... no.....

(if yes please answer questions 7.1 to 7.8 below)

- 7.1 What is the name of the village market?.....

- 7.2 What is the distance from the village to the village market?.....

7.3 Who do you sell fish to at the village market?

- village fish retailer.....
- consumer.....
- other.....

7.4 Which quantities (kg) of fish do you normally sell at the village market?

7.5 Why do you choose to sell fish at the village market instead of the farm-gate or town bazaar?

7.6 Which means of transport do you normally use to take your fish to the village market?.....

7.7 What is the cost of transport per maund (incl. farmer return trip)?.....

7.8 At what price (per kg) do you sell your fish at the village market (most recent transactions)?

- Common Carp.....
- Tilapia
- Silver Carp.....
- Indian Major Carp.....
- Thai Shatputi.....
- Mrigal
- Rui.....

8. Do you sell fish at the Thana headquarters bazaar? yes..... no.....

(if yes please answer questions 8.1 to 8.7 below)

8.1 What is the name of the bazaar?

8.2 Who do you sell fish to at the Thana headquarters bazaar?

- market retailer.....
- consumer.....
- other.....

8.3 Which quantities (kg) of fish do you normally sell at the Thana headquarters bazaar?.....

8.4 Why do you choose to sell fish at the Thana headquarters bazaar instead of farm-gate, village market or district town bazaar?.....

8.5 Which means of transport do you normally use to take your fish to the Thana headquarters bazaar?

8.6 What is the cost of transport per maund (incl. farmer return trip)?

8.7 At what price (per kg) do you sell your fish at the Thana headquarters bazaar (most recent transactions)?

- Common Carp.....
- Tilapia
- Silver Carp.....
- Indian Major Carp.....
- Thai Shatputi.....
- Mrigal
- Rui.....

9. Do you sell fish at the district town bazaar? yes..... no.....

(if yes please answer questions 9.1 to 9.7 below)

9.1 What is the name of the bazaar?

9.2 Who do you sell fish to at the District town bazaar?

- market retailer.....
- consumer.....
- other.....

9.3 Which quantities (kg) of fish do you normally sell at the district town bazaar?.....

9.4 Why do you choose to sell fish at the district town bazaar instead of other markets?.....

9.5 Which means of transport do you normally use to take your fish to the district town bazaar?

9.6 What is the cost of transport per maund (incl. farmer return trip)?

9.7 At what price (per kg) do you sell your fish at the district town bazaar (most recent transactions)?

- Common Carp.....
- Tilapia
- Silver Carp.....
- Indian Major Carp.....
- Thai Shatputi.....
- Mrigal
- Rui.....

QUESTIONNAIRE – HAT FISH RETAILER

1. Name of trader

2. Name of haat

3. How many people do you employ and what are their functions?.....

4. How much do you pay each worker per day?.....

5. Which quantities (maund) of fish do you normally buy each day?

season.....

off-season.....

6. Do you buy fish at the farm-gate? yes..... no.....

(if yes please answer questions 6.1 to 6.7 below)

6.1 Which quantity (kg) of fish do you normally buy from each farmer at the farm-gate?

6.2 Why do you buy fish at the farm-gate?.....

6.3 Are you sometimes responsible for harvesting the fish? yes..... no.....

6.4 If yes, how much does it cost you to harvest one maund of fish?.....

6.5 At what price (per kg) do you buy fish at the farm-gate (most recent purchases)?

Common Carp.....

Tilapia

Silver Carp.....

Indian Major Carp.....

Thai Shatputi.....

Mrigal

Rui.....

6.6 Which means of transport do you normally use to bring the fish from the farm-gate to the haat?.....

6.7 What is the average cost of transport (per maund) from the farm-gate to the haat?.....

7. Do you buy fish at the haat? yes.... no.....

(if yes please answer questions 7.1 to 7.2 below)

7.1 Who do you buy fish from at the haat?

fish farmer..... faria.....
fishermen..... other.....

7.2 At what price (per kg) do you buy fish at the haat (most recent purchases)?

Common Carp.....
Tilapia
Silver Carp.....
Indian Major Carp.....
Thai Shatputi.....
Mrigal
Rui.....

8. Do you buy fish at the thana or district town bazaar? yes.... no.....

(if yes please answer questions 8.1 to 8.7 below)

8.1 What is the name of the bazaar?.....

8.2 What is the distance from the town bazaar to the haat?.....

8.3 Why do you buy fish at the town bazaar?

8.4 Which quantities (maund) do you normally buy at the town bazaar?.....

8.5 At what price (per kg) do you purchase fish at the town bazaar (most recent purchases)?

Common Carp.....
Tilapia
Silver Carp.....
Indian Major Carp.....
Thai Shatputi.....
Mrigal
Rui.....

8.6 Which means of transport do you normally use to bring the fish from the town bazaar to the haat?.....

8.7 What is the average cost of transport (per maund) from the town bazaar to the haat?.....

9. Who do you sell to at the haat?

consumer.....
hotel, restaurant, etc.....
faria.....
other.....

10. At what price (per kg) do you sell fish at the haat (most recent sales)?

- Common Carp.....
- Tilapia
- Silver Carp.....
- Indian Major Carp.....
- Thai Shatputi.....
- Mrigal
- Rui.....

11. Do you also sell fish at the thana or district town bazaar? yes..... no.....

(if yes please answer questions 11.1 to 11.7 below)

11.1 What is the name of the bazaar?

11.2 What is the distance from the haat to the town bazaar?.....

11.3 Why do you sell fish at the town bazaar?.....

11.4 Which quantities (kg) of fish do you normally sell at the town bazaar?.....

11.5 Which means of transport do you normally use to take the fish to the town bazaar?
.....

11.6 What is the cost of transport per maund (incl. return trip)?

11.7 At what price (per kg) do you sell fish at the town bazaar (most recent sales)?

- Common Carp.....
- Tilapia
- Silver Carp.....
- Indian Major Carp.....
- Thai Shatputi.....
- Mrigal
- Rui.....

QUESTIONNAIRE – FISH ARATDAR (COMMISSION AGENT)

THANA AND DISTRICT TOWN BAZAAR

1. Name of aratdar.....

2. Thana/district town.....

3. Name of bazaar.....

4. Who comes to the bazaar to sell fish through the commission agent?

- farmer.....
- fishermen.....
- faria.....
- bepari.....
- other.....

5. What commission do you charge per kg of fish auctioned?

- Common Carp.....
- Tilapia
- Silver Carp.....
- Indian Major Carp.....
- Thai Shatputi.....
- Mrigal
- Rui.....

6. Who buys the fish auctioned by the commission agent in the bazaar?

- bazaar retailer.....
- outside village market retailer.....
- other.....

7. Which quantities (maund) of fish do you normally trade per day?

- season
- off-season.....

QUESTIONNAIRE – FISH RETAILER
THANA AND DISTRICT CAPITAL BAZAAR

1. Name of retailer.....
2. Thana/district town.....
3. Name of bazaar.....
4. Which quantities of fish (kg) do you normally buy per day?
 season.....
 off-season.....
5. What is the retailer's purchasing price (recent transactions)?
 Common Carp.....
 Tilapia
 Silver Carp.....
 Indian Major Carp.....
 Thai Shatputi.....
 Mrigal
 Rui.....
6. What is the retailer's selling price (recent transactions)?
 Common Carp.....
 Tilapia
 Silver Carp.....
 Indian Major Carp.....
 Thai Shatputi.....
 Mrigal
 Rui.....

ANNEX X

QUESTIONNAIRE - VEGETABLE FARMER

1. Name of farmer

2. Village/Thana

3. Distance from village to: Thana headquarters district capital.....

4. Total cultivated land (decimals)

5. Do you sell vegetables at the farm-gate? yes..... no.....

(if yes please answer questions 5.1 to 5.4 below)

5.1 Who do you sell vegetables to at the farm-gate?

village vegetable retailer.....

faria.....

bepari.....

aratdar.....

consumer.....

other

5.2 Which quantities (kg) of vegetables do you normally sell at the farm-gate?

5.3 Why do you choose to sell vegetables at the farm-gate instead of the village or town market?.....

5.4 At what price (per kg) do you sell your vegetables at the farm-gate (most recent transaction)?

Bitter gourd.....

Yard long bean

Country bean.....

Snake gourd.....

Sweet gourd.....

Okra.....

Brinjal.....

Red amaranth.....

Tomato.....

Cabbage.....

Cauliflower.....

Cucumber.....

6. Do you sell vegetables at the village market? yes.... no.....

(if yes please answer questions 6.1 to 6.8 below)

6.1 What is the name of the village market?.....

6.2 What is the distance from the village to the village market?.....

6.3 Who do you sell vegetables to at the village market?

vegetable retailer.....

faria.....

bepari.....

wholesaler.....

consumer.....

other.....

6.4 Which quantities (kg) of vegetables do you normally sell at the village market?

6.5 Why do you choose to sell vegetables at the village market instead of the farm-gate or town bazaar?

6.6 Which means of transport do you normally use to take your vegetables to the village market?.....

6.7 What is the cost of transport per maund (incl. farmer return trip)?.....

6.8 At what price (per kg) do you sell your vegetables at the village market (most recent transactions)?

Bitter gourd.....

Yard long bean

Country bean.....

Snake gourd.....

Sweet gourd.....

Okra.....

Brinjal.....

Reed amaranth.....

Tomato.....

Cabbage.....

Cauliflower.....

Cucumber.....

7. Do you sell vegetables at a village or roadside wholesale market? yes.... no.....

(if yes please answer questions 7.1 to 7.7 below)

7.1 What is the name of the vegetable wholesale market?.....

7.2 What is the distance between the village and the vegetable wholesale market?.....

7.3 Which quantities (kg) of vegetables do you normally sell at the vegetable wholesale market?

7.4 Why do you choose to sell vegetables at the vegetable wholesale market instead of farm-gate, village market or town bazaar?.....

7.5 Which means of transport do you normally use to take your vegetables to the vegetable wholesale market?

7.6 What is the cost of transport per maund (incl. farmer return trip)?

7.7 At what price (per kg) do you sell your vegetables at the wholesale market (most recent transactions)?

- Bitter gourd.....
- Yard long bean
- Country bean.....
- Snake gourd.....
- Sweet gourd.....
- Okra.....
- Brinjal.....
- Tomato.....
- Cabbage.....
- Cauliflower.....
- Cucumber.....

8. Do you sell vegetables at the Thana headquarters bazaar? yes..... no.....

(if yes please answer questions 8.1 to 8.7 below)

8.1 What is the name of the bazaar?

8.2 Who do you sell vegetables to at the Thana headquarters bazaar?

- market retailer.....
- consumer.....
- other.....

8.3 Which quantities (kg) of vegetables do you normally sell at the Thana headquarters bazaar?.....

8.4 Why do you choose to sell vegetables at the Thana headquarters bazaar instead of other markets?.....

8.5 Which means of transport do you normally use to take your vegetables to the Thana headquarters bazaar?

8.6 What is the cost of transport per maund (incl. farmer return trip)?

8.7 At what price (per kg) do you sell your vegetables at the Thana Hedquarters bazaar (most recent transactions)?

- Bitter gourd.....
- Yard long bean.....
- Country bean.....
- Snake gourd.....
- Sweet gourd.....
- Okra.....
- Brinjal.....
- Tomato.....
- Cabbage.....
- Cauliflower.....
- Cucumber.....

9. Do you sell vegetables at the district town bazaar? yes..... no.....

(if yes please answer questions 9.1 to 9.7 below)

9.1 What is the name of the bazaar?

9.2 Who do you sell vegetables to at the district town bazaar?

- market retailer.....
- consumer.....
- other.....

9.3 Which quantities (kg) of vegetables do you normally sell at the district town bazaar?.....

9.4 Why do you choose to sell vegetables at the district town bazaar instead of other markets?.....

9.5 Which means of transport do you normally use to take your vegetables to the district town bazaar?

9.6 What is the cost of transport per maund (incl. farmer return trip)?

9.7 At what price (per kg) do you sell your vegetables at the district town bazaar (most recent transactions)?

- Bitter gourd.....
- Yard long bean
- Country bean.....
- Snake gourd.....
- Sweet gourd.....
- Okra.....

Brinjal.....
Tomato.....
Cabbage.....
Cauliflower.....
Cucumber.....

QUESTIONNAIRE - HAAT VEGETABLE RETAILER

QUESTIONNAIRE - VEGETABLE ARATDAR (COMMISSION AGENT)

THANA AND DISTRICT CAPITAL BAZAAR

1. Name of aratdar.....
2. Thana/district town.....
3. Name of bazaar.....
4. Who comes to the bazaar to sell vegetables through the commission agent?
 - farmer.....
 - faria.....
 - bepari.....
 - other.....
5. What commission do you charge per kg of vegetables auctioned?
 - Bitter gourd.....
 - Yard long bean
 - Country bean.....
 - Snake gourd.....
 - Sweet gourd.....
 - Okra.....
 - Brinjal.....
 - Tomato.....
 - Cabbage.....
 - Cauliflower.....
 - Cucumber.....
6. Who buys the vegetables auctioned by the aratdar in the bazaar?
 - bazaar retailer.....
 - outside village market vegetable retailer.....
 - outside vegetables wholesaler.....
 - other.....
7. Which quantities (maund) of vegetables do you normally trade per day?
 - season
 - off-season.....

QUESTIONNAIRE - VEGETABLE RETAILER

THANA AND DISTRICT CAPITAL BAZAAR

1. Name of retailer.....

2. Thana/district town.....

3. Name of bazaar.....

4. Which quantities of vegetables (kg) do you normally buy per day?

season.....

off-season.....

5. What is the retailer's purchasing price (recent transactions)?

Bitter gourd.....

Yard long bean

Country bean.....

Snake gourd.....

Sweet gourd.....

Okra.....

Brinjal.....

Tomato.....

Cabbage.....

Cauliflower.....

Cucumber.....

6. What is the retailer's selling price (recent transactions)?

Bitter gourd.....

Yard long bean

Country bean.....

Snake gourd.....

Sweet gourd.....

Okra.....

Brinjal.....

Tomato.....

Cabbage.....

Cauliflower.....

Cucumber.....

QUESTIONNAIRE - VEGETABLE WHOLESALER (ARATDAR)

- 1. Name.....
- 2. Wholesale market.....
- 3. Distance from the market and the district case study villages.....
- 4. Number of employees, their functions and salaries.....
.....
.....

5. Do you purchase vegetables at the farm-gate? yes..... no.....

(if yes, please answer questions 5.1 to 5.6)

5.1 Which quantities of vegetables (maunds) do you normally buy from each farmer?.....

5.2 Why do you choose to purchase vegetables at the farm-gate?.....

5.3 At what price (per kg) do you purchase vegetables at the farm-gate (most recent purchases)?

- Bitter gourd.....
- Yard long bean
- Country bean.....
- Snake gourd.....
- Sweet gourd.....
- Okra.....
- Brinjal.....
- Tomato.....
- Cabbage.....
- Cauliflower.....
- Cucumber.....

5.4 Which means of transport do you use to bring the vegetables from the farm-gate to the wholesale market?.....

5.5 What is the average transport cost (per maund) from the farm-gate to the wholesale market?.....

5.6 Which costs other than transport do you incur when purchasing from the farm-gate (e.g. labour)? Please quantify (Tk per maund).....
.....
.....

6. Who do you purchase vegetables from at the wholesale market?

- farmer.....
- faria.....
- bepari.....
- other.....

7. At what price (per kg) do you purchase vegetables at the wholesale market (most recent purchases)?

- Bitter gourd.....
- Yard long bean
- Country bean.....
- Snake gourd.....
- Sweet gourd.....
- Okra.....
- Brinjal.....
- Tomato.....
- Cabbage.....
- Cauliflower.....
- Cucumber.....

8. Where to do you sell your vegetables (client location)?.....

9. To whom do you sell vegetables (type of client)?.....

10. At what price (per kg) do you sell your vegetables (most recent sales)?

- Bitter gourd.....
- Yard long bean
- Country bean.....
- Snake gourd.....
- Sweet gourd.....
- Okra.....
- Brinjal.....
- Tomato.....
- Cabbage.....
- Cauliflower.....
- Cucumber.....

11. Which are the costs you incur when selling your vegetables (e.g. sorting, bagging, loading, transport to different destinations, unloading, etc)? Please quantify (Tk/maund).....
.....

12. Which other costs do you incur in your business (e.g. rent, electricity, telephone, etc)? Please quantify (Tk/maund).....

