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Report on a visit to Bangladesh to
study socio-economic aspects of
Estuarine Set Bag Net Fisheries for
the BOBP Fisheries Programme

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Glossary and acronyms

Aratdars	Traders/wholesalers/fish assemblers
Beparis	Fish distributors (also called "chalanis")
BOBP	Bay of Bengal Programme
Behundi jal	Bag net
CODEC	Community Development Centre
Crore	10,000,000
Dadan	Agent
Dalal	Commission agent
Feri Wala	Fish hawker
Hat	Village market
Hilsa	Herring type fish
Lakh	100,000
Mahajan	Money lender (also called "jogandar" or "faria")
Maund	37.25 kg
Nickaries	Fish retailers
NGO	Non Government Organisation
NRI	Natural Resources Institute
ODA	Overseas Development Administration
Paikers	Fish wholesalers
SBN	Set Bag net
Tana jal	Beach Seine net
Tk	Taka (₳1=66, Sept 1991)
Tong jal	Gill net
Upazilla	Local government district

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Summary and conclusions

1. It is the conclusion of this brief study that the marketing of estuarine Set Bag Net caught fish is relatively efficient by LDC standards. Losses in terms of quality, volume or value are minimal and marketing margins are reasonable given the highly perishable nature of the product.

2. The study indicates the nature and extent of vulnerability and dependency upon estuarine SBN fisheries by producers, intermediaries and consumers.

3. The most vulnerable groups are those whose sole source of income or animal protein is fish or shrimp caught by estuarine SBN. These groups are often amongst Hindu or low caste communities and, therefore, are to some extent disenfranchised from many normal sources of assistance on religious and cultural grounds.

4. The main purpose of this mission was to characterise the marketing of fish caught using Estuarine SBN and thereby identify methods of, a) improving fisherfolk income and, b) reducing the impact of any changes to the fishing method required to protect fish stocks.

5. The importance of seeking fishing practices or alternative income generating activities which compensate all these key interest groups is highlighted.

6. There is a danger, in changing the status quo of these delicately balanced fishing communities, of enhancing the income of one group by reducing the income of another. This limits the ability of technical interventions to improve the well-being of fisherfolk, but suggests that efforts to build institutions which promote self-help and confidence building are the way forward. This type of input is best achieved by NGO "grass-roots" activity.

7. The very low apparent price elasticity of demand for the majority of fish varieties caught by this method gives little scope for additional value through processing, improved marketing, or storage. Higher value fish/shrimp, for which demand is less sensitive to price, are key to additional value and improved income from fish harvests. However, the importance of low value fish to certain groups of fish consumers is emphasised.

8. Fishing family dependency upon SBN fishing varies from partial (ie, families with alternative income sources) to almost total (ie, those landless families with members involved in fishing, processing and marketing aspects).

9. The imputed value of SBN fish as a protein source for fisherfolk and market intermediaries should not be underestimated. Any change away from fishing may result in severe protein depletion amongst this vulnerable group.

10. Juveniles of shrimp and fish caught by this method are the lowest price fish available to the rural fish consumer and, therefore, meet the protein requirements of the most vulnerable of those income groups able to afford fish.

Key findings and recommendations

11. All recommendations should be prefaced by saying that this fishery involves extremely marginal, vulnerable groups. Any changes introduced into the existing systems of fishing and marketing should be made initially on a pilot scale with close scrutiny of socio-economic impact.

Socio-economic impact of changes in fishing practices

12. The mission found that estuarine SBN fisheries provides year round stable income and protein source for fisherfolk and market intermediaries. It was impossible to judge whether this income is adequate. In addition to fisherfolk, a particularly vulnerable sector of the fish consuming public relies on the estuarine SBN catch for cheap animal protein.

13. Given the severe resource constraints upon all these groups, the mission recommends that consideration should be given to adequately monitoring the impact upon these groups of changes in fishing practices. This should take the form of indicative studies of market intermediaries, fishing families, processing intermediaries, and consumers to enable future monitoring and impact assessment.

14. Quantification of the role of Estuarine SBN fisheries in provision of protein should be included in this study.

Additional value for SBN caught fish

15. The study shows that, while shrimp and prawns form the lesser part of overall SBN catches, they provide the greater part of the income, both to fisherfolk and market intermediaries. Ultimately, enhancing the shrimp catch would have greater effect on fisherfolk incomes.

16. The low final market value of fish caught by Estuarine SBN limits the scope for additional processing, storage etc. However, where current bio-economic studies reveal higher proportions of more valuable fish being caught, the feasibility of storage, quality improvement, processing and enhanced producer marketing should be further considered.

Training

17. Changes in fishing practices will necessarily entail investigation of alternative income generating activities for fisherfolk, market intermediaries and fish processors (see para 12 above).

18. The consultant identified a clear need for skills in project identification, assessment, design and planning among the staff of both government and non-government bodies associated with fisheries. It is recommended that a framework be drawn up to provide for these training needs without over-stretching present staff complements.

19. BOBP should consider funding or seeking funds for both in-country short courses in these subjects and/or long term overseas training for one or two key staff members.

Women traders

20. Women market intermediaries were observed to play an important role in the distribution and marketing of Estuarine SBN caught fish. Women traders interviewed found themselves often outbid by larger intermediaries and, therefore, resorting to poorer quality material.

21. In the absence of existing women's organisations, it is recommended that efforts to target and assist these groups through CODEC institution building activities be supported. This is a possible avenue for promoting the assistance of large numbers of women involved in trading and processing fish.

Adding value to the hilsa catch

22. Adding value to fish caught during the annual hilsa catch should be considered. This activity could prove particularly attractive to groups of women already involved in fish processing, who could be organised and targeted.

23. Possible activities include salting, curing and storage of hilsa and packaging/marketing of higher value fish such as Bombay duck.

Variety of catch and fishing systems

24. The danger of generalising about the role of Estuarine SBN fisheries within the family and community context is highlighted. Catch composition, fishing practice, income generation, and dependence upon SBN varies geographically and seasonally throughout Bangladesh.

25. This report, therefore, refrains from making general recommendations with regard to changes to fishing practices.

26. If it is shown that incomes of fisherfolk can be enhanced in the long run by short term abstinence from fishing, a strategy must be developed to tide over those who are most dependent upon this method of fishing until they can resume fishing/trading.

Permanent Ice Boxes

27. The mission noted the possible financial benefits from the use of permanent ice boxes by fish trading intermediaries at landing sites. Locally designed ice boxes are already in use and these should be encouraged. These boxes are best placed with market intermediaries who are domiciled in fishing villages. These groups are best placed to gain maximum benefits from such assistance. It is recognised that the impact of supporting such groups will be "trickle down" in nature. Given the lack of other opportunities for innovation in the post-harvest fisheries area which will benefit the fishing community as a whole, it is felt that this is acceptable.

MAIN REPORT

Introduction

28. This report is a result of a mission to Bangladesh to investigate socio-economic aspects of estuarine set bag net (SBN) fisheries^{1/} in association with the Bay of Bengal Programme, Madras. The mission was conducted from 10th - 30th September 1991 and included extensive field surveys and discussion with relevant institutions.

29. Terms of reference and a full itinerary for this mission are at annexes I and II respectively.

Marketing structure

Introduction and background

30. The marketing structure for Estuarine SBN caught fish is outlined. Individual market intermediaries, price structures and marketing margins are discussed. Examples of the "quick and dirty" market surveys used to gather this information are presented at Annex III.

31. Primary and secondary sources on fish marketing in Bangladesh to date concentrate on the marketing of wet fish (for example see Coulter and Disney, 1987). An outline of the market chain for cured fish is available in Walker and Greeley (1990). Aspects of fish marketing specific to Bhola District are covered by Gordon (1990). The catch of estuarine SBN fisheries combines some aspects of these activities with unique market channels of its own.

32. Broadly, there are three marketing chains for estuarine SBN fish, made up of five fish categories:

- . large, export quality shrimp
- . small shrimp
- . juveniles
- . small fish
- . high value fish (ie, Bombay duck)

33. These market chains are described individually below.

Export quality shrimp

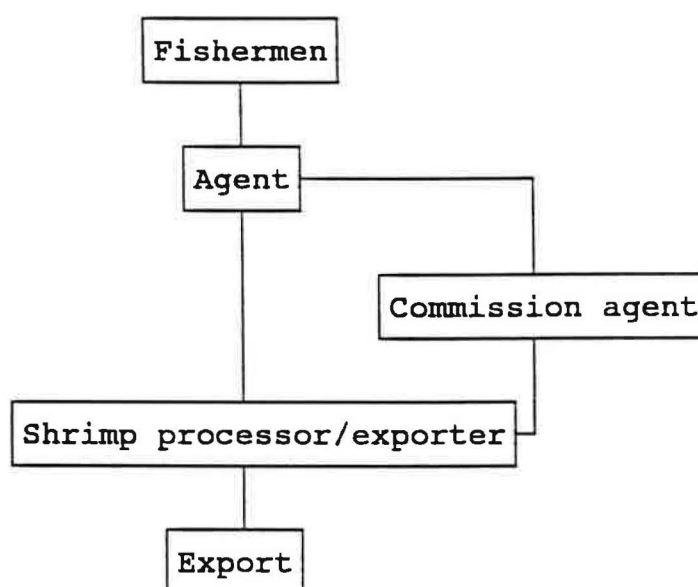
34. The marketing channel for shrimps of exportable size is given in figure 1. Fish exporters use agents to bulk-up material at small collecting offices situated near landing sites. These are partially processed (de-headed and iced).

1/ For clarity, Estuarine Set Bag Net (SBN) fishery is differentiated from Marine SBN fishery by the fact that Estuarine SBN is practised throughout the year.

Factory prices are fixed bi-monthly to coincide with the lunar cycle. Each buying station has 3 or 4 agents who act as intermediaries between fisherfolk and shippers. Agents are paid twice monthly and usually have long-term credit relationships with fisherfolk. Agents maintain links with supplying fisherfolk through informal credit arrangements in return for guaranteed supply.

35. Typically, a commission agent receives Tk200 per maund (37.25 kg) from the exporter for large shrimps and Tk100 for small^{2/}. This commission is deducted from the payments to agents for shrimp supply.

Figure 1: Market chain for export quality shrimps and prawns



Source: Personal communication

Small shrimp and juveniles

36. Figure 2 describes the market channels as they exist in the village of Kumira, a coastal landing site in Chittagong District.

37. The marketing of estuarine SBN caught fish is characterised by tied marketing arrangement between seller and buyer, though considerable flexibility exists for fisherfolk and market intermediaries to exercise options to dispose of the catch in the most profitable and least risky way possible. The small scale of transaction between market operatives is highlighted.

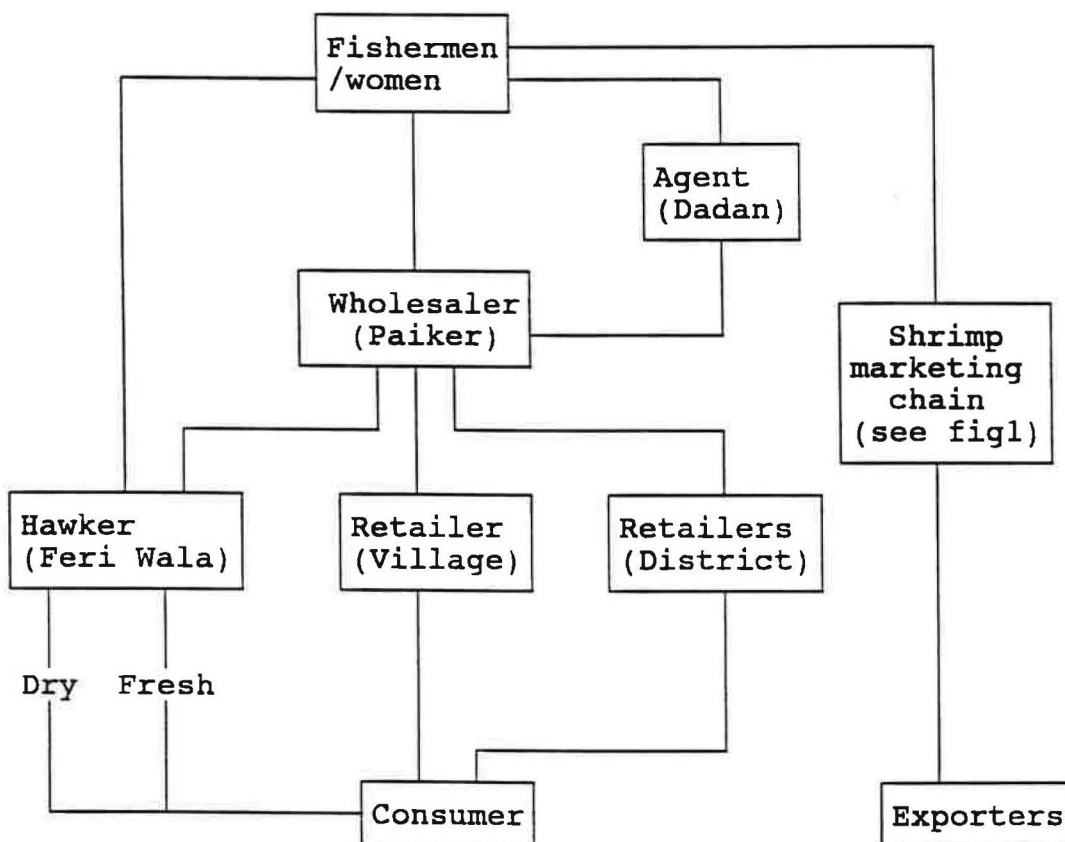
38. Depending on the season and lunar cycle, fishermen have three possible outlets for their estuarine SBN catch: Hawkers (Feri Wala), Wholesalers (Paiker) or Agents (Dadan).

^{2/} October 1991 prices.

These options are reduced if the catch is small (ie, during the off season) or when the lunar cycle requires the catch to be brought ashore at a time when market intermediaries are unavailable ie, at night.

39. Fish are usually sold directly from the boat. Priority sale goes to market intermediaries who have credit relationships with the fisherfolk. It is common in some areas for agents (Dadan) to hire small boats to intercept arriving fishing vessels and buy the whole catch, dividing it and distributing among shrimp exporters, wholesalers and occasionally hawkers.

Figure 2: Typical marketing chain for estuarine SBN fishery



 Source: Personal communication

40. Wholesalers (Paiker) bulk-up quantities of fish for transport to more distant markets. For estuarine SBN this means mainly higher value fish such as shrimp/prawns and Bombay Duck. Smaller material, including juveniles, is disposed of to hawkers (Feri Wala or door-to-door sales persons) and various retailers selling at local daily markets or travelling to district weekly markets.

Credit arrangements

41. Strong credit links exist between fisherfolk and Agents/Wholesalers. The latter supply funds for both fixed and variable fishing expenses in return for fish of equivalent value which are generally supplied at a reduced price. Similarly, much of the retail and hawking trade is conducted on a credit basis, with fish being paid for after final sale. Anecdotal evidence suggests strong inter-family ties associated with this trade, especially in those villages where fishing is the majority activity. It is not uncommon for families to have members who fish, retail, wholesale and sell door-to-door, thus rendering them almost totally dependent upon estuarine SBN.

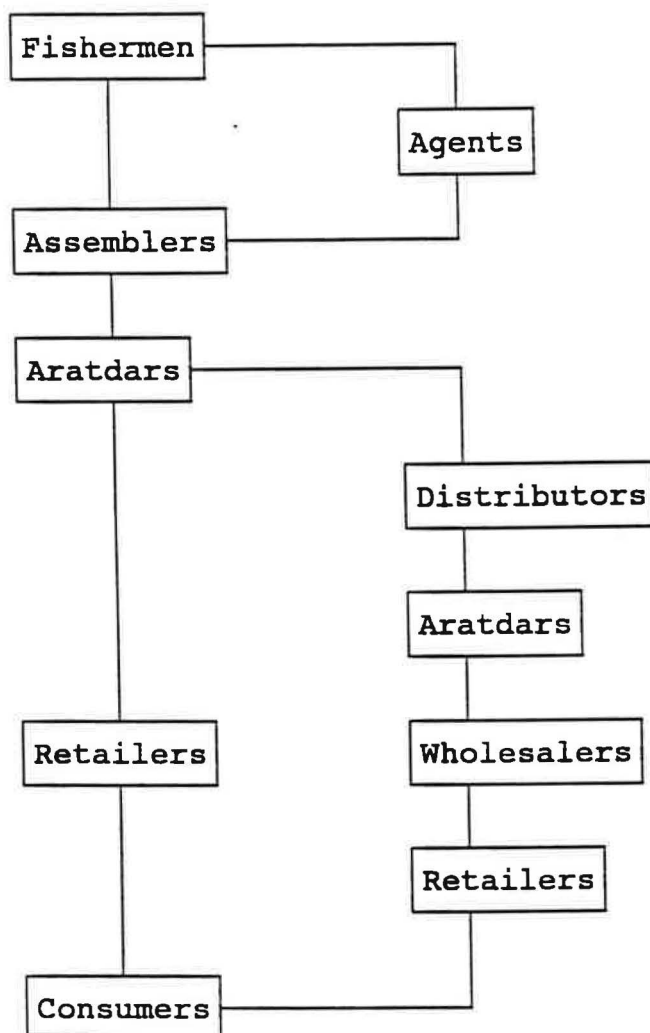
42. Fishermen and market intermediaries are regularly indebted to money lenders (mahajans) who provide capital for fishing activities as well as for private need. Fisherfolk will often maintain a patron-client relationship with a money lender as a safety-net and lender of last resort during times of crisis.

Larger fish, Seasonal gluts and high value fish

43. Figure 3 (based upon Coulter and Disney, 1987, p16) describes the typical marketing structure for non-estuarine SBN fish. The role of assemblers (aratdars) should be noted since this type of market intermediary, typical to the trading of most bulk food items in Bangladesh, is not usually involved in Estuarine SBN fishery^{3/}.

3/ It should be noted that definitions and titles of market intermediaries are often blurred, and it is easy to confuse their roles.

Figure 3: Typical marketing channel for marine SBN and Hilsa fishery



 Source: Based on Coulter and Disney (1987)

Itinerant traders/market intermediaries

44. Special attention is focussed on small-scale retailers. These are divided into two key groups, door-to-door fish sellers (Feri Wala) and market retailers.

45. Discussions held with these groups suggest that they are especially vulnerable to changes in Estuarine SBN fishing practices. It is important that they are not ignored when the changes to fishing practices are decided.

46. Feri Wala and market retailers who specialise in small fish have developed a niche market amongst the poorest fish-consuming sectors of the community. They may find switching to marketing alternative fish types difficult as this would require them to encroach on the markets of other traders.

47. Additionally, it appears that a great many of the intermediaries involved in marketing estuarine SBN caught fish are members of fishing families (or communities) who are engaged in catching estuarine SBN fish. This makes this group doubly dependent on SBN fisheries.

48. Small shrimps provide the greater part of the profit of traders and hawkers depending on availability and catch composition (see Annex III for supporting data).

49. A brief case study of a Feri Wala is given at Box 1 below.

Box 1: Itinerant trader - Kaligunj

Buys 20kg of fish a day, usually in the morning. This is made up of 15kg of small shrimps and 5kg of juveniles. These are sold from door-to door in local villages at between Tk2 and Tk4 profit per kg. Fish is bought on credit from a Paiker (trader). This must be paid back on the same day as purchase is made. Customers invariably buy on credit and this is seen as a way of encouraging repeat sales. Occasionally, the trader must drop prices in order to dispose of his stock. He does not use ice because consumers do not like it. The trader estimates that his total income from this activity is between Tk30 and Tk40 per day.

Prices and marketing margins

50. For the purposes of this marketing study Estuarine SBN fish are divided into fish for which demand is relatively income elastic (export quality shrimps, prawns, Jew fish, Bombay Duck, etc) and the remainder of the catch for which demand is highly sensitive to price. Catch composition is discussed below at paragraph 54.

High value fish and export quality shrimps

51. Prices collated during the mission show that significant premiums are available to fisherfolk for larger shrimps and prawns (see Table 1).

Table 1: Factory shrimp/prawn prices, Sept 1991

Quantity per Kg	----- Shrimp/prawn type -----			
	Tiger*	White*	Giant Fresh**	Macrobrac' Sp.**
11	-	-	568	-
22	-	-	432	-
33	486	-	-	-
44	297	297	346	-
67	216	216	235	-
111	162	162	175	-
155	108	108	-	-
200	-	-	108	-
333	-	-	54	43
Peeled	54	-	54	-
Broken	-	60	54	-

Source:

* Personal communication, Magma Seafood, Gorakghata

** Personal communication, Commission Agents, Patuakhali

52. In the long run, promotion of catches consisting of larger sizes of shrimp will have a beneficial effect on incomes of Estuarine SBN fisherfolk. It is assumed that this market is by no means saturated and that Bangladesh shrimp production is too small to affect world shrimp prices.

53. Prices for the smallest product (Tk 54 per kg) compare favourably with those reported for very small shrimp caught by estuarine SBN (see Table 2).

Other estuarine caught fish

54. Table 2 gives a purely indicative overview of SBN fish prices at the time of this study. Averages are highly subjective measures of real incomes. More important is the low figure which gives an idea of the minimum incomes that might be expected from estuarine SBN.

Table 2: Indicative Estuarine SBN fish prices

a. Landed ("Paiker" rate)

	Small fish & Juveniles	Larger fish (up to 10 cm)	Small shrimp & prawns	Mixed SBN	Transaction between
	-----Tk/kg-----				
Site					
Kumira				12	Fisherman/Peri wala
Garghata				10	"
Cox's Bazaar	13				Fisherman/retailer
S. Selimpur					
- morning				19	Fisherman/Peri wala
- evening				44	"
Rupsha ghat			20		Fisherman/retailer
Kaligunj	6		16		Fisherman/consumer
		30		7	"
	3		17		"
Moreligunj	6		16	7	Fisherman/Paiker
				5	Fisherman/consumer
				15	Fisherman/retailer
				10	Fisherman/Paiker
				10	Fisherman/retailer
Fatheapur				11	Fisherman/Paiker
Patuakhali	8			15	Fisherman/Paiker
Average	7	30	17	14	

b. Wholesale

	Small fish & Juveniles	Larger fish (up to 10 cm)	Small shrimp & prawns	Mixed SBN	
	-----Tk/kg-----				
Site					
S.Selimpur	8			20	
Kaligunj				20	
				12	
Patuakhali				9	
Dhaka	14				
Average	11			15	

c. Retail

	Small fish & Juveniles	Larger fish (up to 10 cm)	Small shrimp & prawns	Mixed SBN	Notes
	-----Tk/kg-----				
Site					
Kumira	10	18			Village market
	15	20	20		Door to door sales
Cox's Bazaar	20		14		Urban market
Thringa	30	45	33		Upazilla market
Firinzi Baza	40				Urban market
S. Selimpur	12			25	Village market
Rupsha ghat				22	"
Kaligunj	5				Town market
Moreligunj			20	7	Town market
			25		
Patuakhali	20	15	5		Town market
Dhaka	30	50	30		
Islamia Ghat	27	20			Inland market
Average	21	28	21	18	

Source: Personal communication, September 1991

55. A further indication of return to marketing was gained from the brief survey conducted (see Annex III). Table 3 shows one example where Feri Wala (hawkers) received the lion's share of total market value (79%). On average, fisherman's share of the final market price for all fish was 41.6% (from a sample of 11).

Table 3: Example of marketing margins

Marketing agent	Selling price (Tk)	Marketing margin (Tk)	Share of final market value (%)
Fisherman	30	-	13
Paiker	48	18	8
Feri Wala	230	182	79
Consumer	-	-	100

Source: see Annex III

Home consumption

56. What is the lowest level of income at which fisherfolk find it no longer financially worthwhile to continue using Estuarine Set Bag Nets? Anecdotal evidence of levels of personal consumption suggests that fisherfolk will continue to fish in the short run providing variable costs plus family protein requirements are covered by returns. Lack of alternative income and protein sources mean that the most dependent groups will continue fishing long after the activity ceases to be financially viable.

57. It is suggested that, in areas where Estuarine SBN fishing is practised as a supplementary activity to farming, fisherfolk will continue to operate when both variable and capital cost are not recovered. This is because they have no other affordable source of animal protein. Estuarine SBN fishing under these conditions is a rational survival method.

58. The element of personal consumption should be quantified since it forms an important part of the expected income from estuarine SBN activity.

Catch composition and volume

59. Anecdotal evidence suggests that, typically, estuarine SBN catches range from as little as 1Kg up to 20kg from multiple net owners, though catches measured by the "quick and dirty" surveys varied between 25-30 kg (see Annex III).

The number, composition, value and volume of catches varies according to the following:

- . lunar cycle;
- . season;
- . availability higher value fish;
- . availability of alternative work;
- . geographical location;
- . net size and structure.

60. Five economically important categories of fish were identified from estuarine SBN. These are:

- . large shrimps of exportable quality;
- . small shrimps;
- . small fish (usually less than one hand long);
- . juvenile;
- . high value fish (ie, Bombay Duck).

61. A list of the major species observed during the mission is given at Annex IV.

62. The danger of generalising about catch composition is emphasised. Table 4 (below) identifies the great diversity in types of catch fisherfolk expect in different areas of Bangladesh. Fishing method, socio-economic conditions, fishing income and dependency on Estuarine SBN differ greatly between regions.

Table 4: Anecdotal Catch Composition Data - Sept 1991

	-----Fish type (%)-----		
	Large fish	Shrimp/prawns	Juveniles
Gorakhata (Cox's Bazaar)	10%	20%	70%
Mongla	-	90%	10%

Source: *personal communication*

63. The hazards of generalisation are pertinent to policy decisions regarding Estuarine SBN fisheries. Changes in fishing practice will not have a universal impact on all Estuarine SBN. For example, a total ban will cause hardship to some fishing families whilst devastating the income generating capabilities of others.

64. Further evidence of catch composition and volume will be available from the bio-economic study currently being undertaken by BOBP in conjunction with the Department of Fisheries, Chittagong.

65. Additional indicative data on income, marketing margins and credit arrangements is presented at Annex III.

Multiple net ownership

66. Is there any marketing advantage being achieved by multiple net owners which might be available to single net operators collaborating?

67. Greater production gives advantages and disadvantages in marketing. Risks of spoilage and losses are higher, but marketing leverage is greater and economies of scale possible. However, there is little to suggest that larger producers have any price advantage.

68. Further investigation would be required to quantify the exact nature of marketing economies present. This would take the form of marketing case studies, weighing and valuing the catch at point of first sale and quantifying any indirect or intangible benefits accruing from larger scale production. These may take the form of credit relationships and patron-client linkages.

Processing

69. Due to the small-average size of fish caught by estuarine SBN and the need to get this low value catch to market before deterioration, the catch is rarely processed. Marine SBN, on the other hand, has a high proportion of larger fish, including hilsa, which are cured, salted and stored.

70. Prospects for adding value by processing estuarine SBN catch are slight. The market for shrimps and prawns is for fresh material. Juveniles are similarly preferred fresh, though some drying does occur during the winter season when the market is over supplied. Opportunities for inter-temporal or inter-spatial financial gain are reduced by the year round availability of SBN fish in its key coastal and riverine markets. Price differentials between districts are not great except where communication is poor. In these areas, locally caught fish tend to trade at a premium, there being no competition from mass market fish such as hilsa.

71. During the period of peak Marine SBN catches, large amounts of small fish are dried. Why is this not done all year round? The main reason is that the weather conditions are not conducive to drying. Alternative added value products based on shrimp by-catch might be considered as a method of supporting the incomes of Estuarine SBN fisherfolk, but there are many difficulties in this approach.

72. It was noted that during hilsa glut periods, SBN fishermen without access to hilsa nets are employed in the processing of the hilsa catch. Particularly, groups of women are employed gutting and salting. The possibilities

of enabling these groups to salt and store hilsa during gluts should be considered. This may be one method of providing additional income to SBN fisherfolk during periods when SBN fishing is banned.

73. The danger of undermining existing capital formation is noted. By supporting one sector of the fishing community, investment by traditional money lenders might be reduced.

Post-harvest losses

74. The mission observed very little obvious post-harvest losses in the marketing of estuarine SBN fish. Losses in quality usually only occur when night catches are necessary (ie, when tide changes occur during hours of darkness). At these times, shrimps are usually iced and juveniles discarded. Fish caught by this method is of low value, therefore additional fixed capital or variable inputs such as the introduction of ice, or alternative storage methods, are unlikely to prove financially viable.

75. Ice is available in all areas at varying cost. Shortages occur during peak hilsa catches when prices can double. Small quantities of ice are commonly used to extend the available marketing period.

Potential for improvement

76. The long-run benefits of larger shrimp catches are central to increasing fisherfolk incomes. Juveniles provide a small, but important part of the overall catch value. This proportionate value would be reduced by increasing the shrimp catch.

77. The relatively high and "lumpy" (ie, all at once) investment required to equip SBN fisherfolk with nets and boats means that there are supply side constraints to producers switching to alternative fishing technologies. This phenomenon (often called "asset fixity") results in supply inelasticity on the part of estuarine SBN fisherfolk who will tend to carry on using sunk capital assets well beyond the point at which marginal returns cease to meet short run average costs. This suggests that assistance will be required to persuade fisherfolk to adopt alternative fishing methods even if these are more lucrative.

78. Provision of loans to small-scale traders, hawkers and market intermediaries should be considered. This would have the advantage of increasing market competition whilst retaining a higher proportion of overall fishing income within the fishing community.

79. Any such support would be best administered by local NGO's working with the community and targeting women and women's groups.

80. Processing of Hilsa by fishing families and particularly by women's groups should be considered (recommendations 22 and 23, and paragraph 71 refers).

81. Additional processing of the by-catch into higher value products might warrant investigation (see paragraph 71 above).

82. The mission found that market prices differ through the course of the day. For example, in South Selimpur Hawkers reported that mixed Estuarine SBN fish were twice as expensive in the evening (see Table 2: Indicative Estuarine SBN fish prices). There is a general preference for consumers to market in the late afternoon. Further market studies should judge the financial efficacy of efforts to exploit this premium market.

Socio-economic implications of change

83. There exists in Bangladesh a delicate balance between those involved in fishing, those involved in marketing and those dependent upon very cheap SBN by-catch (ie, juveniles of shrimps and fish) for protein. Any loss of estuarine SBN by-catch will have an impact on all in the short run. Demand for very cheap by-catch fish amongst the poorest appears to be highly sensitive to price. Any change towards producing higher value fish will reduce fish available to this group of consumers. The key advantages of estuarine SBN are outlined in Box 2.

Box 2: The primary advantages to fisherfolk of estuarine SBN are:

- i. nets are set close to the homestead - reduces travel time, increases security;
- ii. safe to work;
- iii. low capital investment required in comparison to hilsa fishing;
- iv. low maintenance costs;
- v. not dependent on proximity of sea;
- vi. not labour intensive (often operated by one man);
- vii. less likelihood of total net loss than alternatives (especially gill nets);
- viii. provides income and food throughout the year.

84. In addition, low value fish such as juveniles are an important market niche within the Bangladesh fish economy. Crucially, they provide a fish protein source to the poorest fish consumer. There are no cheaper fish available in coastal and estuarine areas. Those involved in trading juveniles are working on extremely low marketing margins and small turn-over making them the most vulnerable of the extensive Bangladesh fish marketing system.

85. Importance of credit relationships between fisherfolk and marketing intermediaries, and between marketing intermediaries and consumers was observed. In most fishing communities alternative formal credit sources are unavailable.

Ice Boxes

86. The opportunity was taken to hold discussions in the village of Kumira where a BOBP ice box is now completed. A hilsa glut was witnessed. During an 8 day period the landed price of hilsa fell by 60% (from about Tk 25 to about Tk 10). Small traders/assemblers able to store fish in ice for 4-5 days may be able to gain considerably from fish/ice storage. It is estimated that, at best, this situation occurs only three times per year. During other periods assemblers may benefit from reduced transport cost through bulking-up large quantities of fish.

87. Simple, locally designed, ice boxes for storing ice and fish have already been constructed in the village of North Selimpur. These boxes are owned by traders and are remarkably similar in design to that provided by NRI (though without proper insulation). The "inventor" of the box claims that all the capital costs were covered by his first big purchase of ice. He buys ice before expected glut periods for Tk 140 per block. The price rises during gluts to above Tk 200 per block. He also intends to store fish on ice during the 8 day glut period and sell when urban prices rise. Profits on ice storage (excluding traders income and capital depreciation) are around Tk1,200 (\$36.4) per 8 day cycle.

88. It is proposed that this key innovator be used as a resource person by CODEC and BOBP, visiting other villages and explaining the benefits of ice boxes to traders. This would be usefully accompanied with a leaflet, diagrams and/or pictures. Alternatively, traders could be brought to see the ice box. The owner is keen to help - the best period to do this is November, after the hilsa fishing is finished.

References

Bostock T W, 1991, Possible Post-harvest activities in Cyclone affected Fishing Communities near Chittagong, Bangladesh, Report on a visit 21-27 July 1991, BOBP, Madras.

Bennett C J & Watson I G, 1991, Report on a mission to Thailand and Bangladesh, March - April 1991, to undertake a socio-economic survey of aquaculture and feed utilisation, NRI (Unpublished), Chatham, UK

Coulter J P & Disney J G, 1987, The handling, processing and marketing of fish in Bangladesh, ODNRI Bulletin No 1, Chatham, UK

FAO, 1985, Pilot Survey of set bagnet Fishery of Bangladesh, BOBP/WP/34, Madras

FAO, 1986, The coastal set Bagnet fishery of Bangladesh - fishing trials and investigations, BOBP/REP/34, Madras

FAO 1987, A preliminary survey of the Set Bag net fishery and its interaction with other marine fishery in Bangladesh, BOBP/RES/SBN

FAO 1989, Results of an explanatory study of the socio-economic conditions of fishing households in Barguna and Patuakhali districts, Bangladesh, BOBP/GCP/RAS/118/Mul, Madras

Gordon A, Fish Marketing Problems in Bhola District, Bangladesh: Report on work undertaken in Bangladesh during March 1990, NRI (Unpublished) 1990.

Walker D J & Greeley M, 1990, Cured Fish in Bangladesh, Report on a visit to Bangladesh, November 1990, on behalf of ODA Post-Harvest Fisheries Project, Bay of Bengal Programme, Madras, India, R1657(R), NRI, Chatham

Annex I: Terms of reference

1. The objective of the study is to identify ways of improving the income of set bag net fisherfolk.
2. The consultant will concentrate on the economics of marketing systems. This will include investigation of the existing fishery with specific reference to catch composition and volume, processing, post-harvest losses and fish quality.
3. Particular attention should be given to the potential for improvements and the socio-economic implications of any changes in post-harvest handling/processing/marketing systems.
4. The consultant should debrief with the Post-harvest Fisheries Adviser in Madras on return from Bangladesh and present a full report within 21 days of return to UK.

Annex II: Itinerary

Date

10th Sept	Arrive Dhaka
11th Sept	British High Commission C Brown, 3rd Sec (Aid) Flood Plains II Preparation team M Greeley, Economist R Moorhead, Social Anthropologist N Willoughby, Team Leader
12th Sept	BOBP A Kashem, Project Officer Travel to Chittagong
13th Sept	G Khan, Project Director Marine fisheries survey and management project, Chittagong
14th Sept	Kumira village
15th Sept	Chittagong - Cox's Bazaar Gorakghata village Magna Seafoods branch office
16th Sept	Wholesale fish market Retail fish market Thringa fish market Cox's Bazaar - Chittagong Department of Fisheries, Chittagong
17th Sept	Faringi Bazaar (Retail market) - Chittagong Momor Khali, fishing village South Selimpoor, fishing village Latipur, fishing village
18th Sept	Chittagong - Dhaka Dhaka - Jessore Jessore fish market
19th Sept	Jessore - Khulna Rupsha Ghat Chanmari market
20th Sept	Kaligunj Mongla
21st Sept	Moreligunj Fatheapur Khulna - Fardipur
22nd Sept	Fardipur - Patuakhali S M I Bhuiyan, District Fisheries Officer R Ahmed, Assistant Fisheries Officer Speed boat to Lohalia Newmarket, Patuakhali
23rd Sept	Patuakhali - Dhaka
24th Sept	BOBP Mugdar Para market Kuoran Bazaar Dhaka - Chittagong (train)
25th Sept	Kumira village
26th Sept	Kumira village South Selimpoor village FAO Project Office, Chittagong G Khan, Project Officer M G Mustapha, Scientific Officer

27th Sept M N Sada, Scientific Officer
Kapatia village
Chondrogona Dobashi market
28th Sept Chittagong - Dhaka (train)
29th Sept BOBP
Bangladesh Rural Advancement Committee
F K Bhuiya, Manager - Rural Enterprise
Project
Dhaka University
30th Sept Dhaka - Calcutta - Madras
1st Oct Madras - UK

Annex III: Results of "quick and dirty" surveys

Introduction

A brief survey of marketing aspects of Estuarine SBN caught fish was conducted. Ten fishermen were interviewed along with the market intermediaries who purchased the catch. The approach is indicative and seeks to highlight the key features of the marketing system in one area of SBN activity. Sample questionnaires are at Appendix I, data summary sheet are presented below.

Two surveys were conducted: one at fisherfolk's first point of sale, and one at the next point of sale. Marketing chains for low value fish are short, therefore, it was possible using this method to cover sales, intermediary and retail elements of the chain.

First buyer survey

Catch

The total weight of catch surveyed averaged 60 kg though most landings were in the range 25-30 kg. This figure is per boat and ignores the number of nets involved.

The majority of fishermen sold their catch to Paikers (6 cases) with whom they had a tied credit/sale agreement (5 cases). Other outlets were retailers and consumers.

Total income from the catch varied from Tk 1900 to Tk 30 depending upon volume and sale price. Average sale price of the catch per kg was Tk 4.9 per kg with a standard deviation of 24%. This gives some indication of the likely range of daily incomes per boat that might be expected at this landing during this season.

Catch composition

The typical percentage breakdown of catches by fish type are shown in figure 1. Almost three-quarters of the total catch can be broadly categorised as juveniles. Shrimp represent about a fifth.

Information was unavailable on the individual value of fish varieties, since all catches surveyed were aggregated and sold to single market intermediaries. It was, therefore, not possible to compare % volume with % value.

Next point of sale

Most of the market intermediaries (7 cases) were selling their fish in local village markets. Two were acting as intermediaries for groups of Feri Wala (in one case 3 Feri

Wala and in the other case 4 Feri Wala). One fisherman was selling directly to the consumer (retailing).

Trader/Hawker survey

Intermediaries

The interviewees were a mixture of Feri wala (6) and trader/retailers of one kind or another (5).

Purchased Catch

The total weight of fish marketed averaged 26 kg but more than half of those interviewed were trading less than 13 kg. The majority of this fish was purchased directly from fisherfolk (73%), the remainder being sourced from Paikers.

The cost of the product per kg varied between Tk 2.3 and Tk 11.7. On average fish cost Tk 5.2 per kg. This compares favourably with the figure Tk 4.9 per kg provided by fisherfolk (see above).

Purchase composition

Material purchased by intermediaries consisted of two thirds juveniles, about one fifth shrimp, the remainder being small fish. It was noticeable that several of the traders had over 80% juveniles. On the whole, small fish made up a very minor part of the traders purchases.

Information on the value of the fish and shrimp at sale was hard to obtain. Of the four cases available, shrimp tended to be of greater proportional value than volume, ie, when shrimp was 15% of the volume, on sale it formed 40% of total value. This reflects the high value per kg of shrimp. In one case juveniles were two third of the volume but only one third of the value.

Marketing margins

On average, the fishermans share of the final market price for all fish was 41.6%. In some cases this included the profit and marketing costs of three market intermediaries.

All but three of the intermediaries interviewed kept some fish for personal or family consumption, though it was not possible to ascertain the quantity or value of these fish.

Credit arrangements

Eight of the eleven intermediaries interviewed had credit arrangements with either their source of supply or their customers. Two had credit arrangements with both.

FIRST BUYER SURVEY RESULTS

	1	2	3	4	5	6	7	8	9	10
(1) Total weight (kg)	26	25	30	4.8	6.9	100	25	320	30	30
(2) Total sale price (Tk)	100	105	120	30	30	370	175	1900	180	110
(3) Value per Kg (Tk)	3.8	4.2	4.0	6.3	4.3	3.7	7.0	5.9	6.0	3.7
(4) Catch composition:										
Type (%)										
Small shrimp	23	20	20	15	48	20	20	28	17	17
Small fish	4	4	2	1	4	1	8	2	3	17
Juveniles	73	76	78	84	48	79	72	70	80	66
Volume (kg)										
Small shrimp	6	5	6	.72	3.3	20	5	89.6	5.1	5
Small fish	1	1	.6	.05	.3	1	2	6.4	.9	5
Juveniles	19	19	23.4	4.03	3.3	79	18	224	24	20
(5) Main buyer 1/	Retailer	Paiker	Paiker	Consumer	Retailer	Paiker	Paiker	Paiker	Consumer	Paiker
(6) Personal consumption (% of total catch)	4	0		0		2.5	8	.6	3.3	3.3
(7) Credit arrangements	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
(8) Next point of sale 1/	Village Market	Feri wala	Feri wala	Village market	Village market	Village market	consumer	Village market	Village market	Village market
(9) Quality problems	No	No	No	No	No	No	No	No	No	Yes 2/

Notes:

- 1/ For definitions of market intermediaries see text
 2/ Fish remaining after end of market discounted by 50%

		1	2	3	4	5	6	7	8	9	10	11
(1)	Source 1/	Fisherman	Fisherman	Fisherman	Fisherman	Fisherman	Paiker	Paiker	Fisherman	Fisherman	Fisherman	Paiker
(2)	Intermediary 1/ & 2/	Feri'	T/R	T/R	T/R	T/R	Feri'	Feri'	Feri'	T/R	Feri'	Feri'
(3)	Purchase price (Tk)	30	370	100	220	170	30	26	45	70	39	50
(4)	Total weight (kg)	13	115	40	20	48	6.5	6.5	9.2	6	7	12
(5)	Cost per Kg (Tk)	2.3	3.2	2.5	11	3.5	4.6	4	4.9	11.7	5.6	4.2
(6)	Catch composition:											
	Type (%)											
	Small shrimp	15	5	50	30	20	31	8		15		25
	Small fish			42.5	5	2	3			5		8.3
	Juveniles	85	95	7.5	65	78	66	92		80		66.7
(7)	Value											
	Small shrimp	Tk		800			77	17.5				
		₹		57.2			69.1	29.4				
	Small fish	Tk		550								
		₹		39.3								
	Juveniles	Tk		48			34.4	42				
		₹		3.4			30.9	70.6				
(8)	Total sales value (Tk)	166.4	1265	1398	200	400	111.4	59.5				90
(9)	Marketing margin 3/	136.4	895	1298	-20	230	81.4	33.5				40
(10)	Fishermans share of final sales price (%)	18.0	29.2	7.2	110	42.5	26.9	43.7				55.6
(11)	Personal consumption	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	No
(12)	Credit											
	To fishermen	Yes	Yes	Yes	No	No	No	No	Yes	No	No	No
	To final buyer	Yes	No	No	No	No	Yes	Yes	Yes	No	Yes	Yes

Notes:

- 1/ For definitions of market intermediaries see text
2/ T/R = trader and/or retailer
3/ Sale price less purchase price

Appendix I:

a. FIRST BUYER SURVEY - ESTUARINE SBN

1. Total weight of catch _____kg

2. Total sale price of catch Tk_____

3. Estimated catch composition:

Fish type	%	Kg	Total sale price	Buyer*
Large shrimps (>3cm)				
Small shrimps (<3cm)				
Small fish (ie, not juveniles)				
Juveniles				
Other (specify)				

* eg, paiker, feri Wala, retailer, assembler, consumer

4. How much fish is kept for personal consumption:

	Large shrimps	Small shrimps	Small fish	Juveniles	Other (specify)
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Type (tick):

Weight:

5. Describe any credit arrangement:

6. What is the next point of sale? _____

7. What price is expected at the next point of sale?

Large	Small	Small	Juveniles	Other
shrimps	shrimps	fish		(specify)

Type (tick):

Weight:

Price:

8. What quantity and type of fish is discarded or discounted because of quality problems?

9. Describe the quality problems

b. TRADER/HAWKER SURVEY - ESTUARINE SBN

1. Type of market intermediary ie, feri Wala, retailer, trader etc

2. Total purchase price of stock Tk _____

3. Total weight of stock _____ Kg

4. From whom was the stock purchased

5. Estimated stock composition

FISH TYPE	%	Kg	Est' sale price	Expected buyer
Large shrimps (>3cm)				
Small shrimps (<3cm)				
Small fish (ie, not juveniles)				
Juveniles				
Other (specify)				

* eg, paiker, feri Wala, retailer, assembler, consumer

6. How much fish is kept for personal consumption:

Large shrimps	Small shrimps	Small fish	Juveniles	Other (specify)
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Type (tick):

Weight:

7. Describe any credit arrangement (a) between interviewee and source of fish, and (b) between interviewee and next purchaser:

(a) _____

(b) _____

8. What or where is the next point of sale? (specify distance, mode of travel, cost of travel and time taken)

9. What quantity and type of fish is discarded or discounted because of quality problems (specify value of discount in Tk per kg)?

10. Describe the quality problems

Annex IV: List of Estuarine SBN caught species observed by the mission (scientific, Bangladeshi and English names)

Fish

<i>Apocryptis</i>	Chiring	
<i>Colia sp.</i>	Alua	Anchovy
<i>Harpodon nehereus</i>	Lottya	Bombay Duck
<i>Lates calcarifer</i>	Batki	Giant sea perch
<i>Otholithoides microdon</i>	Poa	Jewfish
<i>Polynemus paradiseus</i>	Popushi	Tassel fish

Crustaceans

<i>Macrobrachium rosenbergii</i>	Golda chingri	Giant freshwater
<i>Macrobrachium brudis</i>	Catali Itcha	
<i>Metapenaeus brevicornis</i>	Kachu chingri	Brown shrimp
<i>Metapenaeus monoceros</i>	Hainna chingri	Sand shrimp
<i>Parapenaeopsis stylifera</i>	Bagatara	Pink shrimp
<i>Penaeus indicus</i>	Chapda chingri	White shrimp
<i>Penaeus monodon</i>	Bagda chingri	Giant tiger