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Marine fish marketing system and women participation in selected fish catching areas of Bangladesh

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Abstract

This study was conducted with a view to evaluate the existing processing and marketing system of selected eight dried marine fish namely: Rupchanda (Pomphret) (*Pampus chinensis*), Churi (Ribbon fish) (*Trichiurus haumela*), Poa (Jew fish) (*Otolithes argentatus*), Kamila (Eels) (*Muraenesox talabonoides*), Loyitta (Bombay duck) (*Harpadon nehereus*), Lakhua (Indian Salmon) (*Leptomelanosoma indicum*), Maitya (Indian Mackerel) (*Rastrelliger kanagutra*) and Fatra (Herring) (*Ilsha melastoma*), and observed the women participation. This study was based on a sample survey of 25 dried marine fish producers/processors, 15 women and 35 intermediaries from Cox's Bazar, Chittagong and Dhaka. Collection of raw fish; grading; icing; evisceration; washing, cleaning, salting and drying; use of medicine and preservatives and packing were the different stages of dried marine fish processing system. Various intermediaries participated in the dried marine fish marketing channels who were *Bepari*, *Aratdar*, wholesaler and retailer. Transportation facilities like boats/mechanical boats, shoulder-load/head-load truck, rickshaw and van were used to carry fish and dried fish by the producers and the intermediaries. The sources of finance for producers and intermediaries were friends and relatives, NGOs, village money lenders, fellow traders and banks etc. Family supplied women participated mainly in the processing activities of dried marine fish. They engaged in different kinds of processing activities like evisceration, washing and cleaning, icing, salting, sun-drying, grading, packing, storing, care taking, net making etc.

Keywords: Dried marine fish, Processing, Marketing, Women participation

Introduction

Fisheries are one of the important sectors of Bangladesh agriculture. This sector is considered to be the thrust for sustainable development and socioeconomic advancement of rural fishermen and fish producers/processors (Alam 1999). The growing populations of Bangladesh are demanding evermore food. As a result, the populations are suffering from food security and they are not affording to have adequate amount of fish, milk, meat, and eggs due to short supply and high prices of food items. Thus, millions of people have been suffering from acute shortage of animal protein in their diet and lower level of daily per capita consumption. Per capita fish consumption increased to 13.5 kg in 2001/02 from 8.4 kg in 1992/93 (BBS 2001, DoF 2003). Fisheries sector counted for 5.24 % of the GDP which contributed about 20% to the agriculture sector in 2001/02 (DoF 2003). About 1.2 million people were involved in the marine sector and they delivered an annual catch of 95% of the total marine catch (BBS 2001). Women were also involved in fish processing and drying, net making and fish seed collection as well as many of them worked in fish processing factories.

The entire production of marine, estuarine and freshwater fish is easily marketed domestically except a very small quantity of selected species of fin-fishes. Traditionally, people of Bangladesh like to eat fresh fish. Chilled and dried fish are also marketed now a day in large quantities in the towns and cities. About 11 million people indirectly earn their livelihood out of

activity related to fisheries (FFYP 1998). The export market of value-added products is highly competitive, involving changes in type of products, forms and packaging. Often exporters are being disadvantaged by the complexity of health and quality regulations. The dried marine fish, the chilled marine fin-fish and organism even other than fish, could be on the top of the list of export earning items. The major markets for dry fish during 1991/92 were Association for South East Asian Nations (ASEAN) (80.8%), countries of Middle East (10.66%), and European Economic Council (EEC) (8.75%) (EPB 1999). In Bangladesh, the exported fish and fisheries products were of worth Tk 1637.1 million of which dry fish contributed Tk 517 million in 2001/02. The share of dry fish was around 8.32 % of the total exports of fish and fish-products (DoF 2003). Analyses of the existing dried marine fish marketing system and women's participation in marketing system were the main objectives of this study.

Materials and Methods

Primary data were collected from the dried marine fish producers/processors and traders of Chittagong and Cox's Bazar. The selection of the area for this study was made on the basis of concentration of marine fish drying and processing areas. A list of dried marine fish producers/processors of the selected areas was prepared through a preliminary survey. For this study a total 25 dried marine fish producers/processors and 15 women participators in dried marine fish processing from Cox's Bazar were selected purposively. A total of 35 intermediaries which was covered 10 Beparies, 8 *Aratdars*, 7 wholesalers and 10 retailers were chosen from Asadgonj, Reazuddin Bazar, Kazir Deury, Chalk Bazar and Kawran Bazar areas of different primary, secondary and central markets. Eight important dried marine fishes namely Rupchanda (Pomphret) (*Pampus chinensis*), Churi (Ribbon fish) (*Trichiurus haumela*), Poa (Jew fish) (*Otolithes argentatus*), Kamila (Eels) (*Muraenesox talabonoides*), Loyitta (Bombay duck) (*Harpadon nehereus*), Lakhua (Indian Salmon) (*Leptomelanosoma indicum*), Maitya (Indian Mackerel) (*Rastrelliger kanagutra*) and Fatra (Herring) (*Ilsh.a melastoma*) were selected for this study. The data were collected for this study in the year 2001.

Results and Discussion

Processing of dried marine fish

Processing is very important part in dried marine fish for marketing. Quality of dried marine fish mainly depends on its processing system. The processing system, however, differs on basis of different species of marine fishes. Different stages of marine fish processing were as follows.

Collection of fresh fish: The producers/processors bought fresh fish from Bangladesh Fisheries Development Corporation (BFDC) landing center of Cox's Bazar, contact fishermen and boat owners. On an average a producer bought 3000 kg fresh fishes in each season. The average buying price of fresh fish per quintal were Tk 36500, Tk 3800, Tk 4300, Tk 4000, Tk 2200, Tk 33000, Tk 4000, and Tk 2000 for Rupchanda (Pomphret), Churi (Ribbon fish), Poa (Jew fish), Kamila (Eels), Loyitta (Bombay duck), Lakhua (Indian Salmon), Maitya (Indian Mackerel) and Fatra (Herring) respectively.

Grading: After collection of fresh fish, the producers/processors separated fishes according to their species and size such as: large, medium and small. The producers/processors made grade the fishes on the basis of species and quality before icing.

Marketing system of dried marine fish

Five functionaries were found to be involved in marketing of dried marine fish in the study areas. They were producer, *Bepari*, *Aratdar*, wholesaler and retailer who played their important roles staying their own level. They stayed in different level in whole marketing channel but were inter-related and dependent on each other. Details of marketing channel of dried marine fish have shows in Figure 1.

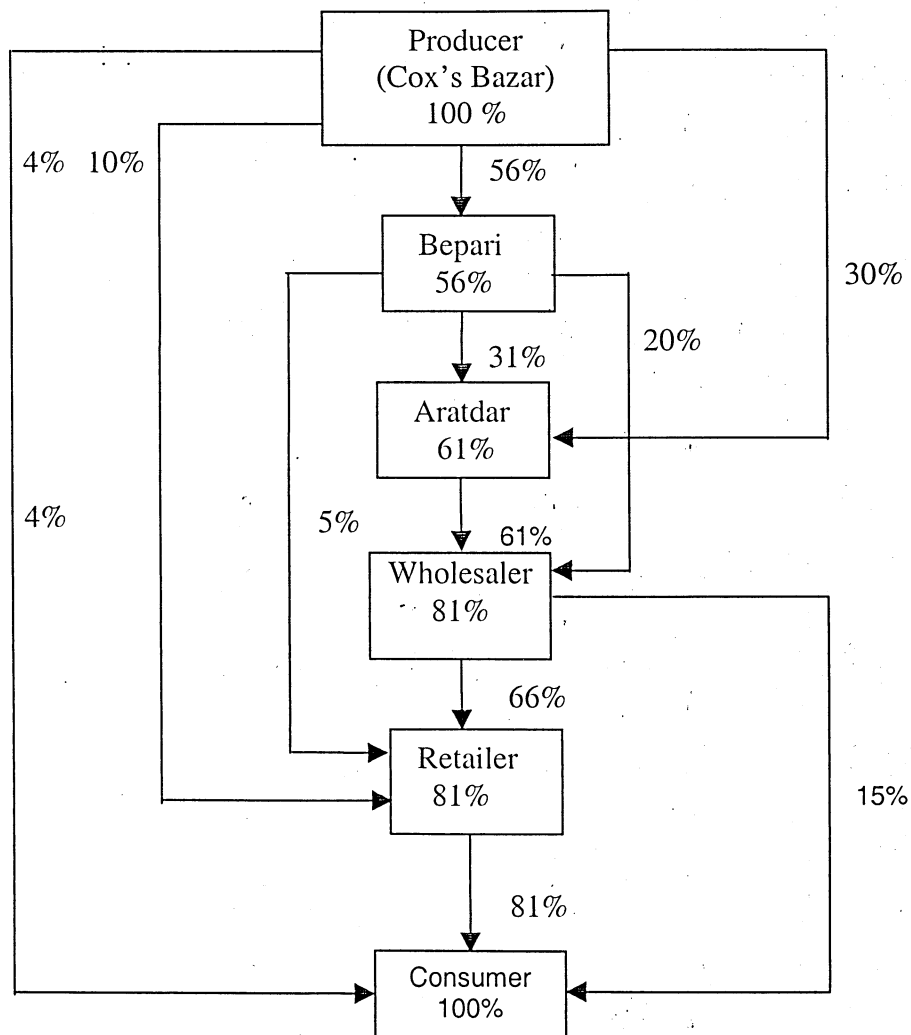


Figure 1: Marketing Channels of dried marine fish in the study area

Producer: Mainly marine fishes were processed for drying by producers in Cox's Bazar. Dried marine fish producers sold the largest portion of their product (56%) to the *Beparis* in Cox's Bazar followed by 30%, 10% and 4% to *Aratdars*, retailers and consumers of Cox's Bazar respectively (Figure 1).

Icing: Icing plays an important role to protect the fish from decomposing. Producers/processors collected ice from Fishery *Ghat* and BFDC landing centre. Moreover, they also collected ice from local ice factories located in the landing areas. When the sunlight was not available, the producers/processors stored the fresh fishes with ice for a short period of time to protect it from decomposing.

Evisceration: In owing to highly perishable nature and maintaining the quality of marine fish evisceration is very important. After collection of fresh fish, producers/processors, hired labourers and their family members eviscerated the fishes. Generally, their female family members did this job and sometimes particularly in the peak period they hired labourers to finish this process as early as possible. For the evisceration, about 6 to 8 labourers per day were needed for 100 kg fishes.

Washing, cleaning, salting and drying: After evisceration, fishes were washed and cleaned in the water. They also used salt and different types of medicines viz. Nogos, Finis and DDT to protect the fishes from insects or fungus infestation after washing and cleaning. For drying the fishes, the producers/processors used their yard, bank of sea, and roof of their houses when sunlight was available and it took 5 to 7 days for a lot.

Use of medicine and preservatives: In drying period producers/processors used medicine and chemicals to protect their products from insect and fungus contamination. Oil and artificial colour were also used for making their products like fresh and good looking, which is very much harmful for human health.

Packing: After drying, producers/processors used polythene and poor quality jute made mat (like cloth made bag) for packaging which was not sufficient as food of human. They packed dried fishes maintaining a fixed weight (on an average 50 kg in a sack) for selling in the markets.

Conversion Rate of Dried Marine Fishes: After processing, the fresh marine fish lost their primary weight and converted into dried marine fishes. The causes to weight losses of different fish species were not only for decreasing water percentage but also for eviscerating and cleaning the fishes. Different species of fishes lost their weights at different ratios and it reveals from Table 1 that Loyitta fish lost highest weight (80%) while Churi, Kamila and Lakhua fishes lost by 60% only.

Table 1. Different conversion rates of marine fishes by species

Species	Ratio of dried and fresh fish
Rupchanda (Pomphret)	0.33 (67%)
Churi (Ribbon fish)	0.40 (60%)
Poa (Jew fish)	0.33 (67%)
Kamila (Eels)	0.40 (60%)
Loyitta (Bombayduck)	0.20 (80%)
Lakhua (Indian Salmon)	0.40 (60%)
Maitya (Indian Mackerel)	0.33 (67%)
Fatra (Herring)	0.28 (72%)

Note: Figures within the parentheses indicate the weight lost for drying fresh fish.

Source: Biswas (2001)

Bepari : *Beparis* were relatively big and professional traders in the study area and shared 56% of marketing channel. They bought dried marine fish from the producers/processors at Cox's Bazar primary market and sold it to the wholesalers and retailer covering 20% and 5% of marketing channel (Figure 1). They sold 31% dried marine fish through *Aratdars* at Asadgonj on payments of commission. They did not have any permanent business establishment. They were jointly organized in group. In Cox's Bazar wholesale market had roughly 30 to 35 parties of such type of *Beparis* and in each party were at least 12 to 16 persons for running their business. They were professional businessmen and with wide experience often came into business through generation after generation. They usually hired labourers. Most of the *Beparis* were seasonal traders in this business. During the lean period they did other types of businesses. There were some local *Beparis* who made their purchase from Cox's Bazar wholesale market and sold their products to retailers of the local markets viz. Baharchara Bazar, Kataltali Bazar, Goldighirpar Bazar and Ramuliarchara Bazar etc.

Aratdar: *Aratdars* were basically the commission agents who normally had fixed establishments in the market. In the dried marine fish-marketing channel, *Aratdar* were found to operate mostly at Asadgonj in Chittagong and at Bazarghata in Cox's Bazar. They had some part-time or full-time salaried persons for performing various functions such as loading, unloading, weighing, grading etc. Generally the *Aratdars* were self-financed, as they require large capital for operating the business. When *Aratdars* acted as commission agents, helped *Beparis* and wholesalers to sell their products by receiving commission from one or both the parties. Commissions varied among the species of dried marine fishes. *Aratdars* never shared any maintaining cost of dried marine fish marketing paid by *Beparis* or retailers. Usually they handled larger volume of dried marine fish than *Beparis* and/or retailers. About 80 *Aratdars* at Asadgonj in Chittagong and about 25 *Aratdars* at Bazarghata in Cox's Bazar involved in this business. The *Aratdars* often gave loan as advance to the *Beparis* on condition that dried marine fishes would be sold through them. Each *Aratdar* advanced loan to the *Beparis* about Tk 80,000–1,00,000 in each season. A *Bepari* may took money from more than one *Aratdar* and in this case he divided his products and sold through different *Aratdars*. There was an association of *Aratdars* and license was essential for operating this business. Figure 1 shows that 61% of the total volume of sales were handled by these *Aratdars*.

Wholesalers: Wholesalers are a group of traders who purchased dried marine fish from the *Beparis* and *Aratdars* and then sold to the retailers and also consumers of dried fishes. They purchased 20% and 61% of dried marine fishes of their product from *Beparis* and *Aratdars* respectively and sold 66% to retailers and the rest 15% directly to the consumers (Figure 1). They had permanent business establishment. Wholesalers were mainly located at the Bazarghata Bazar of Cox's Bazar, Asadgonj and Bahaddarhat of Chittagong and Kawran Bazar of Dhaka in Bangladesh.

Retailers: Retailers were the last linked traders in the channel of dried marine fish marketing. They had permanent shops which usually situated at crowded areas of Chittagong retail market of Reazuddin Bazar, Kazir Deury and Chalk Bazar areas. In Cox's Bazar they operated their business at Baharchara Bazar, Kataltali Bazar, Goldighirpar Bazar and Ramuliarchara Bazar and in Dhaka they were located at Tatari Bazar and New market areas. They bought two-thirds of dried marine fish from wholesalers in cash and one third in credit

and sold to the consumers directly. Most of the retailers were organized and independent. They purchased dried marine fish from producers/processors and *Beparis* which covered 10% and 5% of marketing channel, respectively and sold entire product to the consumers (Figure 1). There were some big retailers and each of them employed 2 to 3 persons for selling dried marine fishes on the basis of daily payment. The retailers usually had long experience in this hereditary profession. To maintain the channel with producers and retailers (see channel 1) have to need license for operating business in Chittagong retail market.

Marketing functions

In the study areas, the whole marketing of dried marine fish has been broken down into various functions such as buying and selling, pricing, grading, storage, transportation and financing etc.

Buying and selling: Buying and selling are the functions of exchange. Both have their primary objects of negotiating favourable terms of exchange. In Cox's Bazar, *Beparis* purchased dried marine fishes from the producers/processors of Kutubdia Para, New fishery para, and Mahesh Khali areas and carried their products by road transports to the *Aratdars* of Asadgonj in Chittagong. *Aratdars* helped *Beparis* to sell their products to the wholesaler on the basis of commission. Retailers of Reazuddin Bazar, Kazir Deury and Chalk Bazar in Chittagong purchased dried marine fishes from wholesalers of Asadgonj and Bahddarhat and sold to the ultimate consumers. Otherwise, *Beparis* of Chittagong supplied dried marine fishes to Kawran Bazar of Dhaka where approximately 30 to 35 *Beparis* operated this business. Again, retailers of Tatari Bazar and New Market in Dhaka bought dried marine fishes from Kawran Bazar wholesalers and sold their products to the consumers directly.

Grading: Grading refers to the sorting of products into various categories as per certain established or accepted standards of quality. The quality of dried marine fishes deteriorates in course of time. Quality of dried marine fishes deteriorated with the change of different levels of marketing channel. In case of dried marine fish marketing little grading was done. Grading on the basis of size mainly large, medium and small were found. Grading according to different species like Rupchanda, Churi, Poa Lakhua, Kamila and Loyitta etc were also found in the study area. Grading on the basis of size, quality, and species were very common practice at the *Arat* center and retail markets.

Packaging: Packaging means enclosing or putting goods in suitable containers to protect them from wastage or deterioration of quality during the time of transportation, handling, etc. Dried marine fishes were mostly packaged by filling 50 kg dried marine fishes in a sack for transportation.

Storage: Storage is concerned with keeping goods and selling those within a limited time. Dried marine fishes were stored in dry, well-lighted and well-ventilated room due to its' perishable nature and to protect from insects and quality deterioration. It matched the pattern of production to the pattern of consumption from the stand point of time. Producers/processors of Cox's Bazar stored their products for two to three months. Otherwise, *Beparis* didn't store dried marine fishes. *Aratdars* and retailers usually stored the unsold dried marine fishes in their storerooms for very short period. Due to lack of proper storage facilities in Cox's Bazar and Chittagong, about 5% of dried marine fishes were lost.

Pricing: Demand, supply and quality of dried marine fishes influenced the price. Factors on rising demand were seriously considered by the traders to determine the price. All intermediaries who were involved in the buying and selling of dried marine fishes followed the open bargaining for fixing the prices of their products. It means that dried marine fish price was determined by the number of buyers attending in the market and the volume of products offered for sale. The individual producer had low bargaining power than intermediaries. Different levels of prices were set for different grades and species of dried marine fishes at primary market where transaction was mostly performed between the producers/processors and *Beparis*. The price of dried marine fishes was determined by the interaction of the forces demand and supply in a less competitive market. Prices also varied 20% to 40% between peak period and lean period. The prices increased for transporting the dried fishes to the places of more distances (Figure 2 and Table 2). Table 2 shows the prices of different species of marine dried fishes increased from 6% (Lakhua) to 123% (Fatra) with respective markets while those prices increased 15% to 246% for transaction from producers to consumers markets. The prices of Fatra (Herring) fishes increased 246% for moving from processors to consumers which was not desirable satisfaction for consumers. Though price of Rupchanda dried fish was highest due to higher demand of this fishes but the change of price of it for transaction was reasonable (15%) (Table 2).

Table 2. Average prices of selected dried marine fishes and percentage change of prices for transaction

Species	Cox's Bazar (Tk/quintal)	Chittagong (Tk/quintal)	Dhaka (Tk/quintal)	% change of producer to consumer's price
Rupchanda (Pomphret)	39000	41565 (7)	45000 (8)	15
Churi (Ribbon fish)	4500	5525 (23)	9000 (63)	100
Poa (Jew fish)	5050	6175 (22)	7500 (21)	49
Kamila (Eels)	4850	6050 (25)	8000 (32)	65
Loyitta (Bombay duck)	3000	4525 (51)	8000 (77)	167
Lakhua (Indian Salmon)	35000	37020 (6)	43000 (16)	23
Maitya (Indian Mackerel)	4800	5630 (17)	7000 (24)	46
Fatra (Herring)	2600	4,035 (55)	9000 (123)	246

Note: Figures in the parentheses indicates the percentage increased of prices with respective markets
Source: Adopted from Biswas (2001)

Transportation: Efficient transporting system is essential for dried marine fish marketing due to its' perishable nature. The means of transport in dried marine fish marketing included trucks, boats/mechanical boats, head-load/shoulder-load, rickshaw/vans etc. A major portion of the dried marine fishes were transacted using head-loads/shoulder-loads by 80% producers/processors in Cox's Bazar while a minor portion of them (20%) carried through vans/rickshaws from landing centre to producing centre. Using intensity of boats/mechanical boats to carry dried marine fishes by respective persons were almost same (5%) except retailers.

Table 3. Mode of transportation used by producers/processors and intermediaries in Chittagong

Types of transport users	(% of producers/processors and traders)				
	Vans/ Rickshaws	Boats/ Mechanical boats	Head-loads/ Shoulder-loads	Trucks	Average distance covered (km)
Producers	15	5	80	-	10
<i>Beparis</i>	10	5	5	80	120
Wholesalers	20	5	5	70	20
Retailers	80	-	20	-	10

Source: Biswas (2001)

Eighty percent of *Beparis* carried dried marine fish by trucks from Cox's Bazar primary market to Asadgonj (Chittagong) who covered a long distance (about 120 kilometres) and then wholesalers carried it from the places Asadgonj to Bahaddarhat through trucks again. Most of the retailers (80%) used Vans/Rickshaws for carrying dried marine fishes from Asadgonj to different retail markets. Retailers, however, covered the shortest distance for selling the products (Table 3).

Financing: About half of operating capitals were accommodated by traders themselves. The producers used all kind of sources for their capital. However, about 41% of them were self-financed for running dried marine fish business. It is found from Table 4 that about 67% of the Aratders were self-financed and the rest depended on banks only. *Beparis* and retailers didn't collect operating capitals from bank but they used other sources of money such as friend, relatives, Aratders, non government organizations (NGOs), money lenders etc. It was remarkable that about 13% Aratders helped producers, *Beparis* and retailers giving money to operate their business smoothly. The lowest amount of capital were invested for dried marine fish business by retailers while Aratders invested 4 times (Tk 200,000) of them.

Table 4. Source of finance of the producers/processors and intermediaries

Producers and intermediaries	Source of finance						Total	Operating capital per season (Tk)
	Own	Friends and relatives	Aratders	NGO	Village money lenders	Bank		
Producers	13 (41)	5 (16)	5 (16)	3 (9)	4 (12)	2 (6)	32 (100)	80,000
<i>Beparis</i>	7 (39)	3 (17)	5 (28)	-	3 (17)	-	18 (100)	1,20,000
Aratders	8 (67)	-	-	-	-	4 (33)	12 (100)	2,00,000
Wholesalers	5 (42)	3 (25)	-	-	-	4 (33)	12 (100)	1,50,000
Retailers	5 (38)	4 (31)	3 (23)	1 (8)	-	-	13 (100)	50,000
All	38 (44)	15 (17)	13 (15)	4 (5)	7 (8)	10 (11)	87 (100)	1,20,000

Figures within parentheses indicate percentages

Source: Adopted from Biswas (2001)

Women participation in dried marine fish processing

In the whole marketing system women had main in the processing activities of dried marine fishes. Table 5 shows that 54% of the women were in age of 15-45 years and its' mean, above half of the women workers were young and energetic. They mainly involved in different kinds of processing activities like evisceration, washing and cleaning, salting, icing, sun drying, grading, packing, storing, care taking, net making etc. They also gave hard labour for almost whole day in drying marine fishes of the processing factories. Again, about 33% women workers were aged in 46 to 60 years and 13% were above 60 years aged. Middle aged women workers (46-60 years) spent 3-6 hours per day, and engaged in processing activities like sun drying, packing, storing, care taking, net making etc. The women workers who were the oldest (above 60 years) spent only 1-3 hours per day for comparatively easier processing activities like care taking and net making. It was observed that the women were family labourers of processors and there were not any hired female labourers in these types of works and processors didn't paid wages at all.

Table 5. Women participation in processing system of dried marine fishes

Age group	Types of work	Duration of work (hour/day)	Number
15-45 years	Evisceration, washing and cleaning, icing, salting, sun-drying, grading, packing, storing, care taking, net making etc.	6-8	8 (54%)
46-60 years	Washing and cleaning, sun drying, packing, storing, care taking, net making.	3-6	5 (33%)
Above 60 years	Care taking, storing, net making	1-3	2 (13%)

Source: Adopted from Biswas (2001)

Conclusion

It could be concluded that *Beparis* purchase dried marine fishes directly from the producers of Cox's Bazar, carry it mainly by truck and sell them to the wholesalers and retailers. *Aratdars* who are commission agents help the *Beparis* to sell their products to the wholesalers. Marketing functions were studied from the viewpoint of buying and selling, packaging, transportation, storage, grading, weighing and financing. Prices of dried fish were determined by the method of open bargaining between buyers and sellers. Market prices depended on the supply of dried fish and numbers of buyers in the market. Payments in cash as well as credit were common in dried fish marketing. The *Aratdars* and wholesalers were found to handle more dried marine fish than the retailers. *Beparis* used trucks, head load, shoulder load, rickshaws and vans for transporting dried fish from the producing area to wholesale market. Other intermediaries used rickshaws, vans, head load, shoulder load at different stages of marketing. In the markets, little grading was done according to their size, quality and species. There were little systematic weighing and measurement standards in dried fish markets. Packaging was needed for transporting dried fish from one place to another. The producers, *Beparis*, *Aratdars* wholesalers and retailers were not self-sufficient in respect of their capital needs. In the whole marketing system women were found participating mainly in the processing activities of dried fish. They remain engaged in different kinds of processing activities like evisceration, washing and cleaning, icing, salting, sun-drying, grading, packing, storing, care taking, net making etc.

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