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FISH CULTURE AND MARKETING SYSTEM IN RANGPUR DISTRICT OF BANGLADESH

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ABSTRACT

The persistence of the study was to evaluate the pond fish culture and marketing system in edict to provide present information on fish culture, barriers of fish culture, fish availability and hence marketing channel for consumer in Rangpur district during July to December 2016. The study revealed that infrastructure of wholesale and marketing fish markets were not satisfactory with regarding to sales area, packaging, sanitation, water supply, drainage, cleaning, washing, maintenance and repairs except very few. The present study highlights the development of pond fish production and marketing through popular level organization. In the present study the marketing channel was old-style and remains in the hands of private traders and government are not so cooperative regarding the issues. So, the price of the fish changes of the different intermediaries: farias, beparies, retailers, and aratdars. The commission agents usually earn about 3-4% commissions from the farmers, hence the price of fish increases in every stage by 20-40%.

Key words: Fish culture, pond fish, marketing system.

Introduction

The total inland area at present is 46, 99,394 hectors in Bangladesh (DoF, 2015). This retains a tremendous scope of fish habitat and diversity of aquatic organisms. Inland fisheries contribute about 83.22% (DoF, 2015) of countries total fish production. Fish and Fisheries sector play an immensely important role on the socio-economic development of Bangladesh from time immemorial and it is the part of our cultural heritage. Fisheries sector contributes about 2.01% of the total export earning, 3.69% to GDP and 22.60% to agricultural sector (DoF, 2015). Fish also contributed about 60% to the nation's animal protein intake during 2013-2014 (DoF, 2015). At present annual fish intake by an individual is 19.60 kg and the annual fish demand is 33.90 metric tons (DoF, 2015). In terms of narrowing the gap between demand and availability, aquaculture has expanded, diversified, intensified and technologically advanced over the past thirty years (Pillay, 2001). The dynamic aquaculture has been developed to become the fastest growing food-producing sector in the world and has significantly contributed to world food security (Jia *et al*., 2001). Fish is grown mainly on natural foods in the water, which are enhanced by the regular application of livestock and poultry manure as well as inorganic fertilizers like urea and triple super phosphate. In addition, in the semi intensive production system, farmers supply rice bran, wheat, oil cake as supplementary feed (DoF, 2001), of which rice bran is the main supplementary feed for fish in pond aquaculture (Karim, 2006). This aquaculture has been shifting towards more commercial production as the demand and price of fish has been increasing with the growth of population. Small-scale farms have also been able to increase production by intensifying management and input use. Many small-scale farms have also intensified production by increasing inputs as well as integrating with agriculture, particularly with vegetables and rice (ADB, 2005; Karim, 2006). The improvement of production technologies certainly increased yield and income from pond aquaculture and benefited farming households. However, the broader impact of pond aquaculture to rural livelihoods, particularly the people involved directly or indirectly in the production managements is not well understood. The utilization of the fishermen is mainly due to the monopolistic set up of the fish traders. Rangpur region is recognized as the fisheries one of our country. Many varieties of freshwater fish (139 species) are available in Rangpur district (Chandra, 2009). Marine fish species are also found abundantly in this town. Marketing system of Rangpur is yet to be understood as there is no previous information on this aspect. Therefore, the present investigation was

initiated to evaluate the existing marketing system of fish, to estimate marketing costs and margins at different levels, to analyze the price variation of fish at lean and peak period and to identify problems to suggest for the improvement fish marketing system.

Materials and Methods

This study was accompanied to know the pond fish farming systems and Marketing system of fish farmers in Rangpur. The research work was carried out in three upazila, namely Rangpur sadar, Mithapukur and Pirganj under Rangpur district. The study was conducted from July to December 2016 through questionnaire interview with 65 farmers. The draft questionnaire was tested with 10 fish farmers in the study area. The final survey questionnaire was developed in logical sequence so that farmers could answer systematically and confidently without hesitation. The farmers who have pond were mainly considered to collect personal information and fish farming information. Though the questionnaires were prepared in English but the farmers were asked the questions through face to face interview in Bengali during the interview. Field surveys were used for the collection of primary data. For the confirmation of the secondary data, primary data was used also. The study area was visited officially to check on standards in term of fish distribution and marketing information. By using questionnaire interviews and direct observations, primary data were gathered for this survey. Thirty fish traders were carefully choosing as the most suitable in the study area through careful inspection for the questionnaire interviews. Information about fish marketing, pricing policy, trading actions, constrains of fish marketing and socio-economic conditions of traders are the consequences of the interviews. Statistical analysis was performed with the Statistical Package for the Social Sciences (SPSS) v. 20.0 software package (SPSS, SAS Institute Inc. Gary, USA). The data were analyzed to determine the descriptive statistics such as Standard Error of Mean, Standard Deviation, Statistic Mean, Minimum and Maximum value and Ranges of variables. Multiple comparisons were done with Tukey's test with one-way ANOVA (Analysis of Variance) at 5% level of significance.

Results and Discussion

In the study, it was found that the average size and depth of pond was 0.20 ha and 1.9 m, respectively. About 40% ponds were seasonal and 60% ponds were permanent. On the other hand, 60% ponds were homestead and 40% were commercial. Pond size is a significant factor for fish culture because all management measures are planned considering the size of ponds. The management of small size pond is mediator than large size pond. Saha (2004) found that the average pond size in Tangail sadar upazila was 0.19 ha, this result was more or less related to the present study. Rahman (2003) found that the average pond size in Gazipur was 0.12 ha. The study noted that 87% of the farmers having single ownership and 13% having numerous ownership on ponds. It was found that almost all of the farmers agreed out different polyculture, tilapia monoculture system and they culture generally carps (Indian major carps and exotic carps) as shown in Table 1.

Table 1. Fish culture methods in the study area

Culture Method	Study area							
	Rangpur Sadar		Mithapukur		Pirganj		All Locations	
	N=20	%	N=20	%	N=20	%	N=60	%
Carp polyculture	10	50	12	60	10	50	32	54
Tilapia monoculture	6	30	5	25	7	35	18	30
Pangus and carp culture	4	20	3	15	3	15	10	16
Total	20	100	20	100	20	100	60	100

Note: N= Samples size

Cow dung was used at the rate of 7510±116 kg/ha in their ponds for both culture and 95% of the farmers controlled aquatic weeds manually. Significance variation was found among the three Upozila for cow dung and MP. But there was no significant differences found for the Urea and TSP both in the mixed culture and Tilapia culture.

Per hectare per year costs and returns of pond fish production for mixed as well as tilapia culture by locations are shown in Tables 3-4. Significantt variance was found for the profit both in the mixed culture and tilapia monoculture. Per hectare average profit from mixed fish culture was higher in Rangpur sadar (Tk. 522685.714±14753/ha/yr) than in Mithapukur and Pirganj Upazilla. For monoculture of tilapia fish net profit was Tk. 898628.57±10395.60/ha/yr in Mithapukur than that of Rangpur Sadar and Pirgang Upazila, respectively. The study also noted that net profit was higher in monoculture than mixed fish culture. The average benefit cost ratio (BCR) was 1.40. The BCR in mixed culture was higher in Mithapukur and Pirganj (1.4) than in Rangpur Sadar (1.39). For tilapian monoculture average benefit cost ratio was 1.67 with higher in Mithapukur (1.68) followed by Pirganj (1.67) and Rangpur sadar (1.67).

Table 2. Distribution of manure and fertilizers used per hector for mixed and tilapia fish culture

Items	Locations				ANOVA (*P* value**)**
	Rangpur sadar	Mithapukur	Pirganj	All Locations (Average)	
Cow dung(kg)	8048.0±2.55^{a}	7498.0±2.54^{b}	6985.0±9.75^{c}	7510.33±116.05	*****
Urea(kg)	473.0±2.54^{a}	483.40±19.31^{a}	437.60±2.50^{a}	464.66±8.01	**NS**
TSP(kg)	438.60±3.31^{a}	438.00±2.54^{a}	433.60±3.53^{a}	436.73±1.79	**NS**
MP (kg)	151.0±1.87^{a}	132.0±3.74^{b}	112.0±2.54^{c}	131.66±4.51	*****

Table 3. Per hectare per year costs and returns of pond fish production for mixed culture by locations

Items	Rangpur sadar	Mithapukur	Pirganj	ANOVA (*P* value)
A. Yield (kg)	13951.42±115.40^{a}	12842.85±65.64^{b}	13198.21±46.89^{c}	*
B. Gross return (tk)	1813685.71±15002.7^{a}	1669571.429±8533.8^{b}	1715767.8±6096.62^{bc}	*
C. Gross cost (tk)	1291000±2895.62^{a}	1226857±7709.60^{b}	1253706.214 ±874.3^{c}	*
D. Net return (B-C) (tk)	522685.714±14753^{a}	442714.2857±13882^{b}	462061.64±6202^{c}	*
E. Benefit cost ratio (B/C)	1.39±0.23	1.4±0.24	1.4±0.24	NS

Table 4. Per hectare per year costs and returns of pond fish production for tilapia culture by locations

Items	Rangpur sadar	Mithapukur	Pirganj	ANOVA (*P* value)
A. Yield (kg)	21305.92±23.01^{a}	21107.78±104.27^{ab}	21008.71±82.81^{c}	*
B. Gross return (tk)	2130592.86±2301.4^{a}	2110778.57±10426.8^{b}	2100071.43±8281.4^{a}	*
C. Gross cost (tk)	1268840±6909.01^{a}	1201215±417.31^{b}	1206053.57±63.43^{a}	*
D. Net return (B-C) (tk)	861752.85±61^{b}	898628.57±10395.60^{a}	840335.71±8184.88^{a}	*
E. Benefit cost ratio (B/C)	1.67±0.042	1.68±0.043	1.67±0.042	NS

NS=Values are not significantly different (p>0.05). Values are Mean ± SEM.
* Mean values with different superscript letters in the same row are significantly different (p>0.05) based on one-way ANOVA followed by Tukey's test.

There is no significant variation was found among the price of the fishes from the different fish market. Highest amount of fish price was found 724.83±8.36 for Chanda fish and lowest amount was found 79.38±2.09 for Silver fish (Table 5). Due to the growing demand of fishes go with low supply and manifold variety of channel members in between harvesters and final consumers, a large price rise continues to grow in this fish marketing chain which is mainly created and influenced by the channel mediators. The improved amount of catches by the fisher and effective marketing of produces at appropriate price will help fishermen to fetch higher profit from the investment.

Table 5. Average selling price (Tk/kg) and demand of fish in Rangpur District

Group	Fish species	Price (Tk/Kg)	ANOVA (*P* value)
Others carp	Bata	130.06±1.67	NS
	Sharpunti	122.00±1.22	NS
Cat-fish	Shing	488.29±10.58	NS
	Magur	480.83±10.36	NS
	Pungus	121.93±2.28	NS
	Tengra	371.83±3.15	NS
	Boal	280.83±1.67	NS
Live fish	Shol	478.83±9.36	NS
	Taki	80.39±1.65	NS
	Koi (Desi)	700.83±10.43	NS
Small fish	Kachki	520.83±12.8	NS
	Chanda	724.83±8.36	NS
	Mola	480.83±10.36	NS
	Punti	122.46.83±1.43	NS
Others	Tilapia	480.83±10.36	NS
	Hilsha	767.69±15.34	NS
	Baim	183.38±1.24	NS
Carps	Rui	186.07±0.91	NS
	Mrigal	138.30±1.04	NS
	Grass cap	120.30±1.24	NS
	Catla	182.84±1.25	NS
	Silver	79.38±2.09	NS

NS=Values are not significantly different (p>0.05). Values are Mean ± SEM.

Almost all the aratdars were fronting many problems and going through a very vulnerable livelihood. Low income (with daily and seasonal variation) was the most common and severe. In most cases there was no auction sheds, packing sheds, even proper drainage and hygienic facilities. Unauthorized intruders (Mastan), credit, lack of workers, undeveloped communication etc. were the main constrains of the aratdars. The marketing system of surveyed fish landing center and market at Rangpur was not satisfactory as shown in Fig. 1. From the survey, it was found that, multiple ownership, lack of scientific knowledge, lack of carp seed, lack of equipment for harvesting, lack of feed and lack of marketing facilities were most constraints for fish production. Rahman (2003) found more or less matched with the above finding. Khan *et al.* (1998) found that lack of extension work for fisheries improvements caused the highest difficulty in pond fish culture. The improvement of a resourceful fish marketing system from the present status depends upon the overall level of national development. A vigorous attempt to advance the system should begin from a very watchful and detailed assessment of the problem. The structure of the market could be characterized by a situation of the presence of many buyers and sellers.

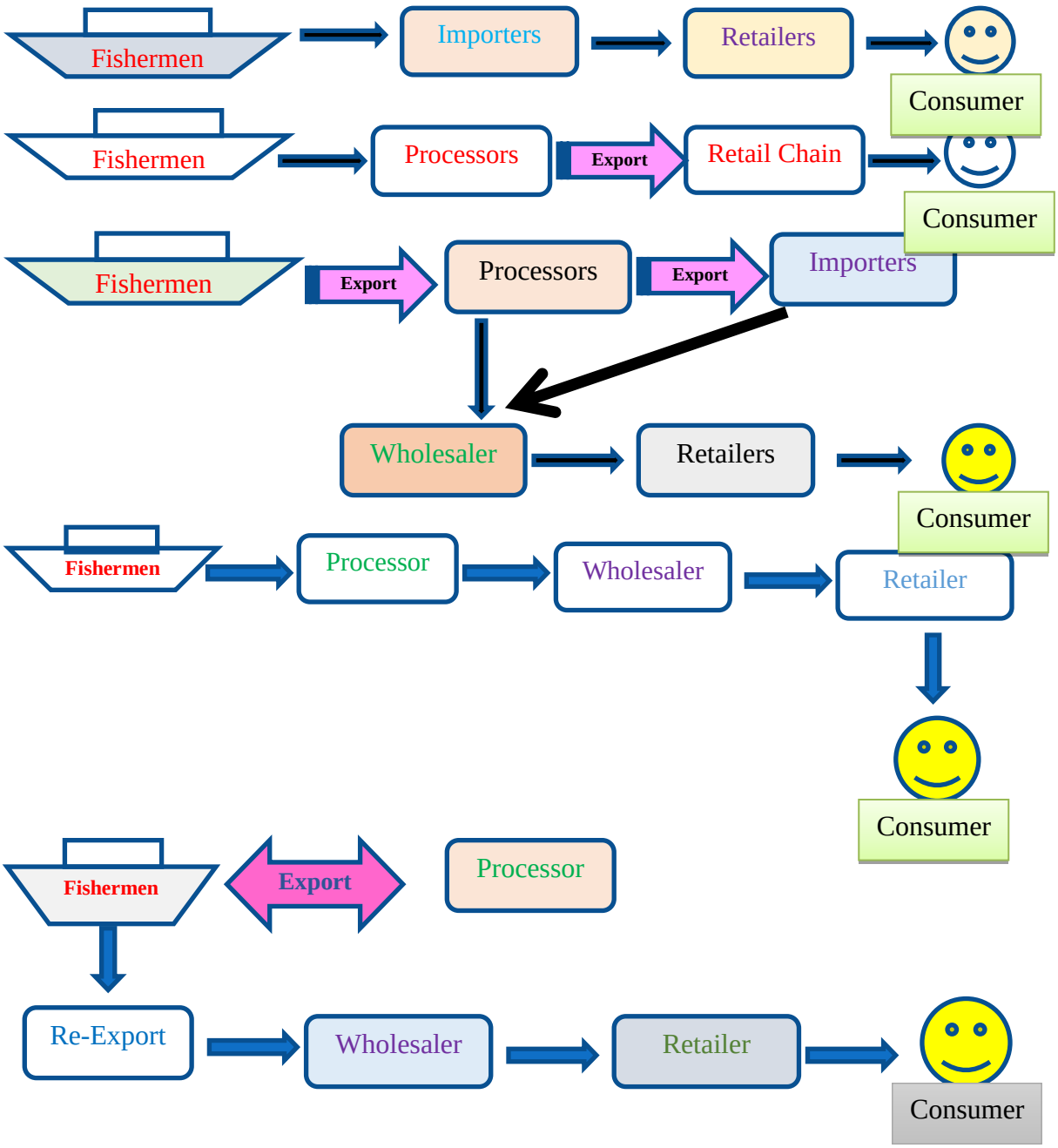

Fig. 1. Types of different fishery value chains

Nevertheless, experience offers for the vital role which is played by the government regarding profitable marketing systems. For giving strength and confidence to the community organizations and their networks in marketing management, long term solution desired for these purpose. Short term solution may also provide fishers to get a superior price for their catch including greater market transparency by providing with market information and better fish-care practice. The development of a series of modern facilities in this wholesale market, where hygienic and less physical handling subsists may lessen the losses due to qualitative damages. Training and extension in improved handling processing criticized at all those involved in the handling of fish, including fishermen, traders and municipal authorities. At the national or policy level, an important role of government should be played to advance marketing by the means of proper price policies, training and extension works in marketing and management of relevant market research. Instituting the bargaining power of the farmers/fishers by providing with the real information about the present market status, pricing policy, credit facilities and above all, the formation of association is a right supervision.

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