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Supply chain analysis of mud crab (*Scylla serrata*) in Bangladesh

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Abstract

The present study has been under taken to examine supply chain of mud crab and to identify socio-economic characteristics of crab collectors. The study finds out that the main actors of mud crab in Bangladesh are collectors, faria, depot owners, suppliers, exporters, fatteners, local consumer, commission agents and dokandar. The marketing channel involved collector, fatterer, depot owner, supplier and exporter. The wild collectors play an important role in the sense that they collect 63 per cent of the total crabs from Sundarban areas. Commission agents charged commission @ Tk. 2 per kg of crab. The findings shows that respondents of Khulna were more educated than of Satkhira. 25% percent of the collectors had secondary education in Khulna while it was only 15% in Satkhira. The findings also shows that most of the crab collectors (60%) and (65%) in Khulna and Satkhira districts lived in mud walled with golpata shed respectively, whereas 5% of them lived in wooden walled with tin shed house both in Khulna and Satkhira districts. Most of the crab collectors were illiterate because in the early stage of life they are compelled to enter into different activities due to their poor economic condition.

Keywords: Collector, depot owner, fatterer, mud crab, supply chain

1. Introduction

The export sector plays an important role in determining the rate and structural pattern of the development of any country. A large amount of coastal belt location and production friendly climate makes Bangladesh one of the notable growers of a vast range of mud crab of impeccable quantity. Ahmed (1992) [1] found that there are 16 species of crab available in our country, among them 4 species inhabit fresh waters while the remaining 12 species inhabit marine waters. However, only the mud crab inhabiting marine or brackish waters is commercially important. Mud crabs occur abundantly in the whole coastal region of the Bangladesh particularly in the estuaries, tidal rivers of the Sunderbans mangrove swamps and vast coastal Ghers or shrimp polders according to Khan and Alam (1992) [5]. The annual production of crab is estimated to be more than 10,000 tons (Zafar and Ahasan, 2006) [7]. During winter (November to January), the largest number of crabs are harvested from the mangrove areas and the tidal rivers. During rainy season (June to August), shrimp Ghers are the main sources of mud crab. The maximum number of catch occurs during spring tide and neap tide locally known as Goun (Uddin, 2002) [6]. Apart from the soft shell wild mud crab fattening in earthen ponds has been starting in coastal area of Bangladesh since 1993 (Chakaria Sundarban, Rampal, Munshiganj and Paikgacha areas). Considering the increasing demand of mud crab in the local and international markets, it has been gaining popularity among the coastal communities in greater Khulna and Chittagong regions (Azam, *et al.* 1998) [2]. Export of mud crab started in 1977-78 and became a stable business in 1982 and ranked third among frozen foods that were exported for earning foreign currency from Bangladesh. The export of live mud crabs from Bangladesh has increased many folds in the last decade. Bangladesh earned Tk. 140.90 million from export of crab in 2003-2004, which contributes 0.03% of total export earnings. Bangladesh earned Tk. 303.71 million from crab export in 2004-2005, which contributes 0.06% of total export earnings. The annual changes of export earnings from crab are 115.55 percents (BBS 2004-2005) [4]. So Bangladesh has immense prospect of exporting mud crab to the world market. Realizing the increasing importance of crab business, the present study has been undertaken with the following objectives: (i) to identify the socio-economic characteristics of mud crab collectors (ii) to examine supply chain of mud crab.

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2. Materials and Methods

2.1 Selection of the study area

In this study researcher selected the areas which reflected the crab business throughout the country. Firstly the researcher has purposively selected two districts like Khulna and Satkhira and then he was selected two upazila in each districts. Four upazilas were namely Paikgacha and Dacop in Khulna district and Shamnugar and Kaligonj in Satkhira district.

2.2 Selection of the samples

The sample included crab collector, depot owner, supplier and exporter. At first a list of 140 crab collectors, 40 fatteners, 80 depot owners and 80 suppliers from Khulna and Satkhira district and a list of 40 exporters from Dhaka were selected. Forty crab collectors, 10 fatteners, 20 depot owners and 20 suppliers were selected randomly from selected areas. Besides, 10 different types of crab exporters were selected randomly from Dhaka city for this study. Thus the sample size was 100.

2.3 Collection of data

Both primary and secondary data were used in this study. Greater Khulna region is one of the concentration areas of crab business. Primary data were collected from the selected sample by using three sets of questionnaires. Secondary data

were collected from different sources like EPB, BBS and from various Journals and reports.

2.4 Data processing and analysis

The collected raw data of each and every schedule were carefully edited to detect errors and omissions and to avoid irrelevant information. Then the data were transferred to excel sheets from the survey schedules in a systematic way for easy analysis. Necessary pre-tabulation tasks were accomplished before the final tabulation. Finally the tabulated data were analyzed on the basis of the set objectives.

3. Results and Discussion

Socio-economic characteristics of the crab collectors are discussed the present study. There are numerous interrelated and constituent attributes that influence an individual's behavior and decision making with respect to crab collection practices. A number of socio-economic aspects of the sample household were considered in the present study. These were family size, age distribution, occupation, level of education, land ownership, sources of capital, health facility, housing condition etc.

3.1 Socio-Economic Characteristics of Mud Crab Collectors

Table 1: Socio Economic Profile of Crab Collector

Socio Economic Profile	Khulna District (% of total number) N=40	Satkhira District (% of total number) N=40
Educational status		
Illiterate	30(6)	35(7)
Primary	45(9)	55(10)
Secondary	25(5)	15(3)
Drinking water facilities		
Flitted pond water	65(13)	70(14)
Pond water	5(1)	5(1)
Tube -well water	30(6)	25(5)
Sanitation condition		
Katcha	70(14)	65(13)
Pucca	30(6)	35(7)
Light use		
Electricity	20(4)	15(3)
Kerosene	80(16)	85(17)
Housing condition		
Wooden wall with tin shed	5(1)	5(1)
Mud wall with tin shed	10(2)	5(1)
Mud wall with straw shed	25(5)	25(5)
Mud wall with golpata shed	60(12)	65(13)
Health care facilities		
Quacks	55(11)	50(10)
Kobiraj	30(6)	25(5)
Qualified doctor	5(1)	5(1)
Homeopathy	10(2)	10(2)
Hospital	5(1)	10(2)
Land ownership		
Landless	20(4)	25(5)
0-5	40(8)	35(7)
6-10	25(5)	30(6)
11-15	10(2)	5(1)
Above 15	5(1)	5(1)
Secondary occupation		
Labour	65(13)	60(12)
Fishing	15(3)	20(4)
Craft and gear making	10(2)	5(1)
Wood collection	5(1)	10(2)
Van pulling	5(1)	5(1)

Monthly income		
1000-1500	25(5)	30(6)
1500-2000	50(10)	40(8)
2000-2500	15(3)	15(3)
2500-3000	5(1)	10(2)
Above 3000	5(1)	5(1)

The findings shows that respondents of Khulna were more educated than that of Satkhira. 25% percent of the collectors had secondary education in Khulna while it was only 15% in Satkhira. Most of the crab collectors were illiterate because in the early stage of life they are compelled to enter into different activities due to their poor economic condition. In Khulna district, it was found that only 30% of total crab collectors used tube well water from Governmental tube-well or those belonging to schools or neighbours in Khulna while it was 25% and Satkhira district. While rest of (70% and 75%) the crab collectors used filtered pond water and non-filtered pond water in Khulna and Satkhira district respectively. The findings also mentioned that only 30 parents of crab collectors could afford sanitary toilet provided by local government office in Khulna district whereas it was 35 Satkhira district. In the study areas most of the crab collectors used kerosene which varied from 80 percent in Khulna to 85 percent in Satkhira districts. In Khulna and Satkhira districts, only 20 per cent and 15 per cent of crab collectors used electricity respectively. The findings also shows that most of the crab collectors (60%) and (65%) in Khulna and Satkhira districts lived in mud walled with golpata shed respectively, whereas 5% of them lived in wooden walled with tin shed house both in Khulna and Satkhira districts. It was observed from in Khulna district that 5 percent of the crab collectors got medical facilities from qualified doctors from Upazila health

complex and MBBS while it was double in Satkhira. The study shows that average 87.5% of the crab collectors in the study areas were dependent on village doctors (unqualified practitioners, homeopathy, *kobiraj*, etc) for their treatment. The data also express that in Khulna and Satkhira districts, 20 per cent and 25 per cent of the crab collectors had no land respectively. While only 5 per cent of them had above 15 decimal lands in Khulna and Satkhira districts. The landless collectors lived in *khas* land. Occupation status is an important indicator of socio- economic status. Main occupation of all the crab collectors was crab collection. The table shows that secondary occupation of the most crab collectors (67%) were day-labour in Khulna while it was 60% in Satkhira. The main source of income of the crab collectors was crab harvesting and selling. The table 1 shows that in Khulna and Satkhira district, monthly income of the most (50%) and (40%) of the crab collectors were Tk.1500-2000 respectively whereas only 5% of them earned above Tk. 3000 both in Khulna and Satkhira district.

3.2 Supply Chain of Mud Crab

There are many actors and main features in the chain. Some have more important than others. The supply chain is depicted in figure 1 and the main actors and features of mud crab supply chain are described below.

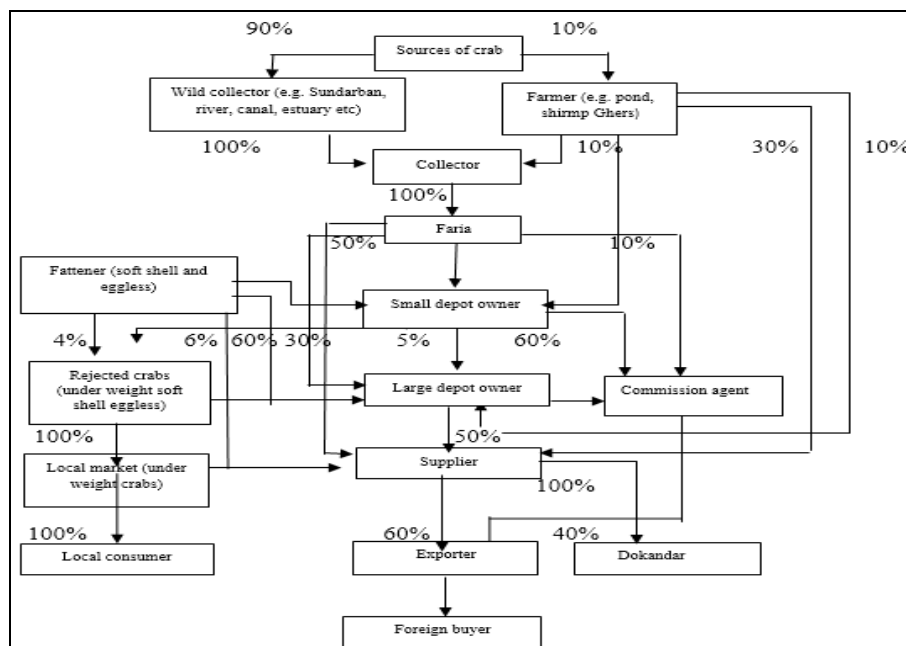


Fig 1: Mud crab supply chain of Bangladesh

3.3 Main Actors of Mud Crab

3.3.1 Collectors

Crab collectors are the key actor and they collect crabs from Sundarban, river, canal, estuary and shrimp Gher. They sold their collected crab to the faria or brokers, depot owners and suppliers. The wild collectors were bound to sell the crabs at a

low price to the specified brokers or traders who provided them loan in their lean period. As a result most of the cases they did not get actual price of their products.

3.3.2 Faria

The second actor of the supply chain is faria. Faria purchased

crab from the collectors and sold their product to certain depot owners or suppliers who gave them loan in their business. Faria purchased small amount of crabs from different collectors and assembled and sold large volume of crabs to the small depot owners or large depot owners or suppliers.

3.3.3 Depot owners

Depot owners were medium merchants and licensed traders having fixed business premise and godown. Their business premises usually were situated at the communicated areas in Chalna bazar and Paikgacha bazar in Khulna district and Kaligonj bazar and Shamnagar bazaar in Satkhira district. They had one or two hired labourers or part time salaried persons for performing various marketing functions. They purchased crabs from collectors, Faria, small depot owners, fatteners and sold to the suppliers

3.3.4 Suppliers

Suppliers were big merchants and also licensed traders having fixed business premise and godown. Their business premises usually were situated in the well communicated areas in Paikgacha, Shamnagar, Kaligonj etc. They have some hired labourers or part time/full time salaried persons for performing various marketing activities. They purchased large volume of crabs from large depot owners, small depot owners, Faria, farmers, fatteners and collectors and sold to the exporters in Dhaka.

3.3.5 Exporters

In the process, exporters were the last point of the domestic marketing channel. They purchased crab from suppliers, commission agents, or “Dokandar” and sold to the foreign buyers. After procurement, crabs were finally sorted, graded and packed in bamboo baskets in the exporters processing centers. They had fixed offices which were located at different areas of Dhaka city like Mirpur and Uttara etc. Exports were done on consignment basis. The exporters got order (from buyers) previous evening asking for the grade wise quantity to be sent in the following day.

3.3.6 Fatteners

The persons who purchased soft shell or eggless crab from traders for sale in future through fattening are called fatteners. They purchased soft shell or eggless crabs at low price and fattening. And then they sold their product at high price to the depot owners, suppliers and commission agents.

3.3.7 Local consumer

The people of Batiaghata, Dapoce, Shamnagar, Chalna etc. are local consumer. They purchased underweight crabs. Most of the local consumers are Hindu. But many Muslims people are also buyers of crabs.

3.3.8 Commission agents

Commission agents purchased crab from small depot owners or large depot owners or Faria in Khulna and Satkhira districts on behalf of the exporters. They did not bear any cost. All the costs are bore of exporters. They performed most of the marketing activities of transporting. They did not take title. They charged commission @ Tk. 2 per kg of crab.

3.3.9 Dokandar

Dokandars are a professional group of traders who have godown. They purchased crab from suppliers and sold to the

exporters. They performed same activities as of exporters such as clearing, grading, packaging etc. For this reason they get high price from suppliers. The exporters take the crab baskets to the airport from Dokandar godown.

4. Conclusion

Mud crab can be identified as a significant one for our economy for its noteworthy contribution in raising the exchange earnings and occupies an important position among the items exported from Bangladesh. The export of crab directly benefits the coastal belt communities; increases in export certainly raise the income of the coastal people and cater to the alleviation of coastal people poverty through generating coastal belt development.

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