



RESEARCH ARTICLE

CAPTURE, MARKETING SYSTEM AND EXPORT POTENTIALITY OF FRESHWATER MUD EEL
(*MONOPTERUS CUCHIA*) IN SOME SELECTED NORTH-WEST REGION OF BANGLADESH

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ABSTRACT

The present study was conducted based on field survey method in six districts of Rajshahi division during the year of 2015-16. The study revealed that eels are harvested by using baited traps, long line hook, hands, frog and handmade tools from different natural water bodies. October to December is the peak season for harvesting although freshwater eels are available round the year. Daily harvesting rate depends on season ranging from 2.0-3.5 kg/collector. Annual production by eel collectors of different district in study areas were found as: Bogra: 9.39 mt, Sirajgonj: 6.50 mt, Pabna: 6.30 mt, Natore: 5.40 mt, Rajshahi: 4.30 mt and Noagaon: 7.20 mt. Highest productions were obtained from Bogra district (9.39 mt) and it is 24.03% of the total production. The market chain from collector to consumers passes through a number of intermediaries like local Bepary, Agents, Arotddar, Exporters and Buyers. Aluminum containers, plastic drums, bamboo baskets with polythene covers are commonly used for keeping fresh water eel alive during the transport. Generally two grading system is involved for marketing of eel in Bangladesh. Eel of Bangladesh are exported to many countries of Europe, Asia and Middle East. From the study it was found that, 40 beparies monthly export total: 35.9 mt, 12 arotddars: 26.7 mt and 18 exporters: 93.6 mt respectively. It was found that exporters export their eels to different countries mainly China (75%).

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INTRODUCTION

Bangladesh is an agro-based developing country and is striving hard for rapid development of its economy. Fisheries is one of the major sub-sector in the agricultural sectors and plays a vital role in the socio-economic development of rural area, fulfilling the animal protein demand, creating employment opportunity, alleviating poverty and earning foreign exchange for the country (Ahmed, 1997). The fisheries sector contributes 4.37% of the gross domestic product (GDP), 23.37% of agricultural resources and 2.01% of foreign exchange earning of Bangladesh (DoF, 2014). In Bangladesh, shrimp is the main aquatic item facing grave environmental, socio-political and socio-economic consequences have resulted in the wake of its expansion which jeopardized the livelihood of millions, particularly the most vulnerable women and children (Rahman, 2003), concurrently, crab worth an important position of immense prospects. However eels, a recent export item though have not yet been given attention, its culture and collection

could be considered as an alternative option for poor peoples and an emerging trade for fishery product traders. Considering demand in the international markets (Rahman, 2007), eel fishery has been gaining popularity among the community of greater Khulna, Chittagong, Mymensingh as well as Sylhet and Comilla region (Rahman, 2011). Besides these, wild eels are collected from Rajshahi, Bogra, Sirajgonj, Nator, Naogaon, Pabna region by eel collectors. There are four species of eel, *Monopterus cuchia*, *Anguila bengalensis*, *Pisodonophis boro*, *Pisodonophis cancrivorus* available in Bangladesh, in which *Monopterus cuchia*, is a fresh water air breathing swamp mud eel locally known as kuchia or kucha, belongs to the family synbranchidae of the order synbranchiformes (Jhingran, 1991), are presently exported to Japan, Korea, Hongkong, Thailand, China and Taiwan. It is carnivorous and nocturnal in nature and prefers animal based food like small fishes, mollusks and worms (Nesar, 199) and treated as weed fish. Present survey, considering the different socio economic and trading factors have identified the potential for the marketing, pricing policy of eel in market, marketing inefficiency and collection of eel as an alternative livelihood activity.

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MATERIALS AND METHODS

The present study was conducted based on field survey method wherein primary data were collected from the respondents. Secondary data was collected from web articles, reports, journals, thesis and District Fisheries Offices. The study area is confined to six districts named Bogra, Naogaon, Rajshahi, Sirajgonj, Pabna and Nator. In the study areas, there were a number of eel collectors, traders i.e. *Aratder*, *Bepary* and *Paiker*. These districts are diversifying low land area, small ditches, canal, and marshland as well as smaller size derelict ponds, where freshwater eel is available and collected by eel collectors. Therefore, supply and marketing point of view these districts were selected for the study. Total sample size of the study 100. Selected samples consisted of 60 eel collectors and 36 traders. The intermediaries dealing with eel marketing were categories in to two groups namely *Aratdars* and *Beparies*. From different stages of eel marketing, 24 *beparies* and 12 *Aratders* were selected as respondents for the study.

Marketing channel of fresh water mud eel

- **Eel collector:** Collectors are those who collect *cuchia* from wild sources and sell them *bapari* or *arotdar*. Very often collectors collect *cuchia* of different categories depending on size and species.
- **Seller:** Seller buys *cuchia* from collector and sells to the wholesaler in reasonable price.
- **Whole seller:** Wholesalers buy *cuchia* from collector or *bapari* and sell them to the supplier. The function of the wholesaler is to store the fish.
- **Supplier:** Supplier collects *cuchia* from wholesaler and seller. They rent a packing center packing and transport to airport near to exporter. Supplier are benefited from whole seller and exporter because only they know about the real market price of the fish. Market price fluctuates sometimes because of seasonal variation.
- **Exporter:** Exporter are also eel retailers but they do not sell directly to the consumers, they transport *cuchia* to the other buyers. Fresh water *cuchia* has great demand in China, Japan, Hongkong, Taiwan, Thailand, Singapore, Malaysia and USA. Exporter contact with others buyer through email, telephone, internate or personal contact.

Sample Number

A total of 50 interviewee of *cuchia* collectors, 20 of sellers (*bapari*), 10 of depot owners and 20 of exporters were selected for questionnaire interviews in five district of Rajshahi division as stakeholder.

Table 1. Sample size in different areas of six districts in Bangladesh

Study area	No. of collectors	No. of sellers	No. of depot owners	No. of exporters
Bogra	10	4	2	4
Sirajgonj	10	4	2	4
Pabna	10	4	2	4
Nator	10	4	2	4
Rajshahi	10	4	2	4
Naugaon	10	4	2	4
Total	60	24	12	24

Data collection

Data collection as well as field survey was under January to June 2015. The data was collected through stakeholder based separate semi-structured questionnaire furnished by a pre-investigation. Data collection methods were followed by the steps these are: questionnaire interviews with collectors, sellers, depot owners and exporters separately, focus group discussion with intermediaries and cross-check interviews with key informants.

Problem of data collection

Some problems were confessed during data collection collectors were busy in their personal work and unwilling to take, they thought the researcher to be law-enforcer man, government official of tax of other department and feared to talk, language problems or use of local terminologies, data in local units. The problems were overcome by the researcher through given extra-attention and more discussion.

Data processing and analysis

After collection, data were verified to eliminate errors and inconsistencies. Some of the collected data were in local units due to respondent's familiarity with those units. These data of local units were converted in to international units before transferring to the computer. Preliminary data sheets (in computer) were compared with original questionnaire and result sheets to ensure the accuracy of the data entry. Data were processed and finally analyzed using Microsoft Excel and SPSS (Statistical Package for Social Science).

RESULTS AND DISCUSSION

Freshwater Mud eel Production and Capture system

The study revealed that eels are harvested by using baited traps, long line hook, hands, frog and handmade tools from different natural water bodies (beels, canals, ponds, ditches, rivers & floodplains). October to December is the peak season for harvesting although freshwater eels are available round the year. Daily harvesting rate depends on season ranging from 2.0-3.5 kg/collector. Annual production by eel collectors of different district in study areas were found as: Bogra: 9.39 mt, Sirajgonj: 6.50 mt, Pabna: 6.30 mt, Natore: 5.40 mt, Rajshahi: 4.30 mt and Naogaon: 7.20 mt. Highest productions were obtained from Bogra district (9.39 mt) and it is 24.03% of the total production. Other areas production is 16.67%, 16.12%, 13.82%, 11% and 18.42%, respectively. An existing annual production in six districts of Rajshahi division was found to be approximately 39.07 mt. Rahman *et. al* and Rahman noticed that the highest annual production 245.11 mt/year was recorded in the freshwater districts and coastal areas produced 117.43 mt/year. They also stated that annual production of different district was as Cox's Bazar: 6.48 mt, Chittagong: 7.43 mt, Satkhira: 9.45 mt, Barisal: 10.34 mt, Khulna: 10.67, Nator: 18.06, Pabna: 18.33 mt, Mymensingh: 19.36 mt, Kishoreganj: 28.63 mt, Habigonj: 29.62 mt respectively. Mohibul Hasan *et.al* [9] also reported that exporters collect freshwater eel from Noakhali region on an average about 28.0 mt per month. In the present study, annual eel production of the study areas was so far below than the others district. This may be due to unavailability and decreasing of freshwater mud eel in natural

water bodies as well as indiscriminate harvesting of eel year after year.

Marketing system of freshwater eel

In eel marketing systems, there are a number of people involved in the study areas. The market chain from collector to consumers passes through a number of intermediaries like local *Bepari*, *Agents*, *Arotddar*, *Exporters* and *Buyers*. The demand for fresh water eel is high for export but supply is not enough because fresh water eel is in vulnerable condition. Eel collectors never directly communicate with exporters, they normally connected via middlemen. The middlemen usually buy eel from the collectors but does not seem to have formal agreements with particular producer. Collector directly sells their eel to wholesalers or through local agents.

Then suppliers use plastic basket and foam box for the preparation of export, they takes special care of eel during packaging to decrease mortality. Finally exporter export freshwater eel by cargo plane.

Eel Marketing Channel

Eel are sold in both domestic and overseas market. Major supply chains of eel in the study areas are shown in below:

- Overseas Value Chain: Eel collectors-Bepari-Aratder-Exporters-Buyers-Consumers
- Domestic Value Chain: Eel collectors- Local Agent/Bepari-Aratder-Exporters

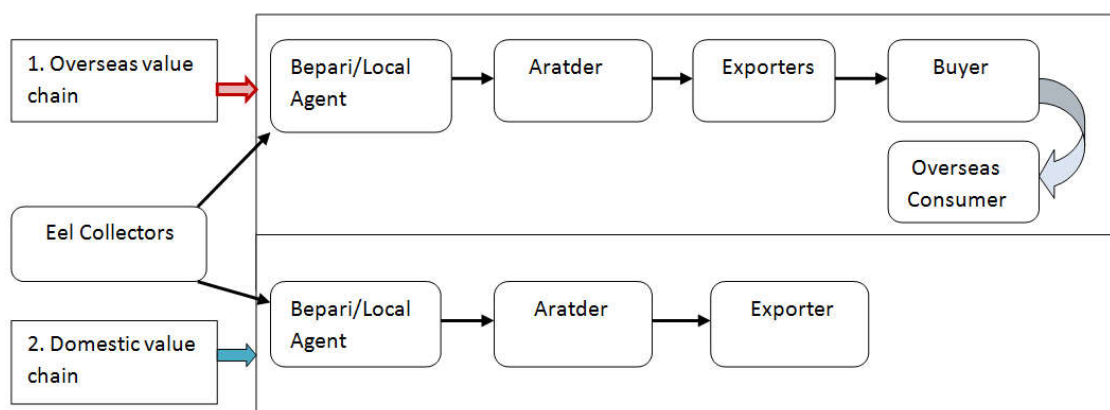


Figure 1. Value chain of eel in the study areas

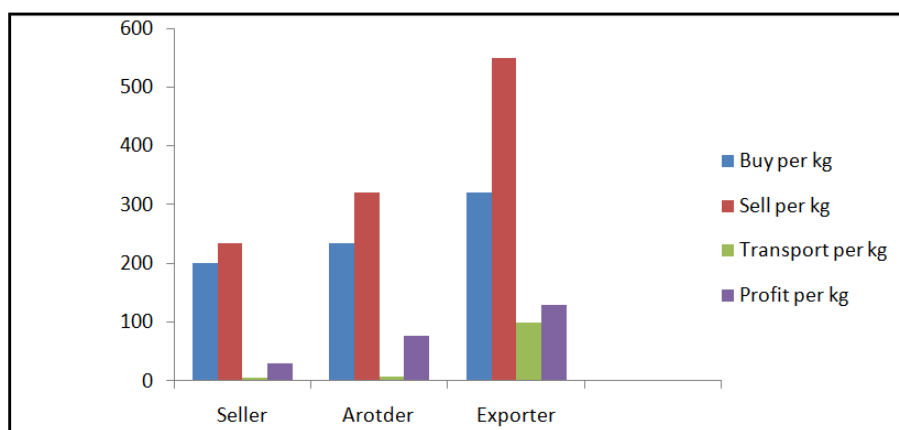


Figure 2. Price variation in freshwater eel marketing channel study areas

Local agents or *Beparies* usually sell the fresh water eel to the *Arotdders*. Local agents have informal agreements with wholesalers obliging them to supply certain quantities in spite of the lower profit margins. Local agents used to carry fresh water eel from remote village where the rate is low. In the study areas maximum number of *collectors*, *beparies* or *supplier* take small amounts of *dadon* (credit) from *Arotdders* (wholesalers) to ensure the supply of eel. *Dadon* is a system of tied credit through which the wholesaler advanced money to the suppliers in exchange for the assured sale of eel. Wholesaler commonly use mechanical vehicles (trucks, pickup and microbus) to transport eel from local area to Dhaka packing center which takes 6-7 hours depending on the communication system. Aluminum containers, plastic drums, bamboo baskets with polythene covers are commonly used for keeping fresh water eel alive during the transport.

Price variation in eel marketing channel

There are many factors affecting the price of freshwater eel in local and international markets, particularly as the supply of freshwater eel is mainly depending on wild source. When the interviews were made about the marketing operations over the price, the majority of the collectors claimed that suppliers had most influence over price, while conversely; the suppliers and exporters had the greatest influence over the price paid (Figure 2).

Export Potentiality of Freshwater Eel

Eel of Bangladesh are exported to many countries of Europe, Asia and Middle East. From the study it was found that, 40 *beparies* monthly export total: 35.9 mt, 12 *arotdders*: 26.7 mt

and 18 exporters: 93.6 mt respectively. It was also found that exporters export their eels to different countries mainly China (75%), Japan (5%), Thailand (8%), Malaysia (4%) and South-Korea (10%) (Figure 3). Mohibul Hasan et al (Mohibul Hasan and B. S.Sarker, 2012) showed that exports of freshwater eel to different countries from Bangladesh were Japan (3.5%), Malaysia (3.5%), America (3%), Thailand (10%) and China (80%).

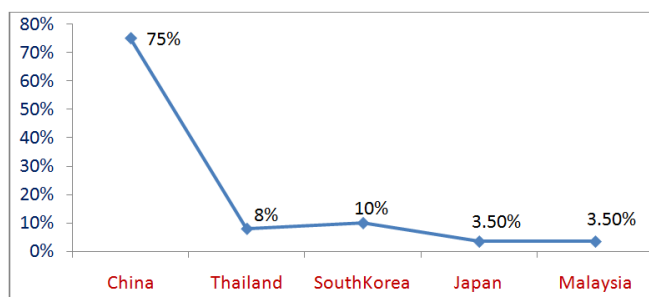


Figure 3. Exports of freshwater eel to different countries from Bangladesh

Table 2. Price variation in eel marketing channel in selected study areas

Items	Collectors	Sellers	Arotders	Exporters
Buy/kg	-	200/-	235/-	320/-
Sell/kg	200/-	235/-	320/-	550/-
Expenditure/kg	-	5/-	8/-	100/-
Profit/kg	200/-	30/-	77/-	130/-

Constraints of marketing

A number of constraints for eel marketing were reported by suppliers and arotders including higher transport cost, poor road and transport facilities, lack of suitable packaging materials, high mortality due to stress, inadequate drainage system, poor water supply, poor sanitation facilities, unhygienic condition and exploitation by middlemen as a result of low market prices. According to the suppliers, political disturbances have also affected transportation as well as marketing.

Conclusion

In Bangladesh *M.cuchia* commonly found throughout the country. Freshwater eel is an export fishery that playing an important role in international markets in Bangladesh. Though eels have not yet been given any attention, its culture and collection could be considered as an alternative option for poor peoples and an immerging trade for fishery product traders. The project has been carried out due to the concept on high export potentiality of the freshwater mud eel. *Monopterus cuchia* are presently exported to Japan, Korea, HongKong, Thailand, China and Taiwan. So it can be a profitable export item to earn foreign currency. From this study it was found that marketing system of freshwater mud eel affects by various factors.

If we establish a proper marketing channel and also some policy to export cuchia then it will be profitable business for the people of Bangladesh.

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