

## Marketing of Freshwater Turtles and Tortoises in Different Markets of Rangpur Division, Bangladesh

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**Abstract:** A study was conducted to evaluate the trading and marketing structure of freshwater turtles and tortoises in different markets of Rangpur division, Bangladesh from April to September 2012. Data were collected through questionnaire interviews and focus group discussions. The market chain from producers to consumers passes through a number of intermediaries: agents/suppliers, wholesalers and retailers. Based on a sample of 30 traders from the six different markets, four were retail markets and rests two were wholesale markets. The supply of freshwater turtles and tortoises in Jagannath *hat* (A Small Part of Bazar) of Panchagarh; Ramgonj Bazar of Nilphamari; Velapir Bazar of Saidpur, Nilphamari and Khochabari *hat*, Ruhia, Thakurgaon in a market day were estimated 110-150 kg, 30-50 kg, 20-40 kg and 20-50 kg respectively. It was estimated that 60% of freshwater turtles and tortoises supplied in the markets were soft shell turtles such as *Lissemys punctata*, *Aspideretes hurum* and the other remaining part was hard shell (40%). The price of *Lissemys punctata* varied from Tk. 400-450/kg, *Aspideretes hurum* Tk. 450-650/kg, *A. gangeticus* Tk. 400-450/kg, *Morenia petersi* Tk. 250-300/kg, *Kachuga tecta* Tk. 200-250/kg and *Geoclemys hamiltonii* Tk. 200-250/kg were found during the study period. Turtle traders run their business through networking and coordination among each other and in great confidentiality though the trade is banned from 1998 both locally and internationally. Strict execution of laws regarding trade control; captive breeding; conservation education and awareness both at national level and community level; scientific and social research; establishment of turtle hatcheries and protection of nesting sites will help to save this threatened species from extinction.

**Key words:** Turtles • Tortoises • Extinction • Poaching • Marketing

### INTRODUCTION

Bangladesh is tremendously diversified with fish and fisheries. This sector is contributing 2.73% of the total export earning and 4.43% to the GDP. The contribution in GNP is Tk. 19567.90 core and contribution to agricultural sector is 22.21% [1]. The country has about 113 species of mammals, over 630 species of birds, 126 species of reptiles and 22 species of amphibians. It has 260 freshwater species and 475 marine species [2]. The total number of reptile species in Bangladesh is 126 of which 109 inland and 17 marine species. Among the 328 species of turtles and tortoises of the world, 27 species of turtles and tortoises are found in Bangladesh which comprises about 10% of world's total turtle and tortoise species [2].

Turtles of Bangladesh are divided into two main categories i.e. sea turtles and freshwater turtles and tortoises. Family Cheloniidae includes the following five

sea turtles: Loggerhead turtle (*Caretta caretta*); Green turtle (*Chelonia mydas*); Hawksbill turtle (*Eretmochelys imbricata*); and Olive Ridley turtle (*Lepidochelys olivacea*). Twenty two species of freshwater turtles and tortoises are found in Bangladesh. Of the 263 species of freshwater turtles (i.e., not tortoises or sea turtles), one species is already extinct, with 117 of the remaining 262 species considered threatened by the IUCN and 73 (28%) either critically endangered or endangered. Of the 58 species of tortoises (family Testudinidae), seven are already extinct and one is extinct in the wild, with 33 of the remaining 50 species considered threatened and 18 (36%) either critically endangered or endangered, yielding 41 of all tortoise species either already gone or almost gone. Of the seven species of sea turtles, six are considered threatened and five are critically endangered or endangered [1].

Bangladesh has signed, ratified, accepted and acceded to CITES in 1981 and Convention on Biological diversity in 1992. Thus Bangladesh adheres and commits to the conservation of biodiversity [3]. During the early 80's, the turtle trade in Bangladesh was at its peak, even though some of the turtle species in trade were already in the schedules of Bangladesh Wildlife Protection Act, 1973 [4]. Although the marketing of turtles and tortoises both locally and internationally was banned since 1998 by Bangladesh government due to threat of extinction, local marketing of freshwater turtles and tortoises is continuing openly as before [5].

To understand present marketing pattern, biodiversity status, government policy regarding freshwater turtles and tortoises the present study was conducted to examine the marketing trend of freshwater turtles and tortoises; their availability; socio economic status of freshwater turtle and tortoise traders and identify threats and recommend actions to conserve freshwater turtles and tortoises in Rangpur, Bangladesh.

## MATERIALS AND METHODS

In Bangladesh different species of freshwater turtles and tortoises are collected from canals, rivers, tributaries etc. These freshwater turtles and tortoises are then sold openly in different tortoise selling markets such as Old Dhaka, Madaripur, Gopalganj, Narail, Faridpur, Sariatpur, Nilphamary, Dinajpur, Thakurgaon, Panchagarh

etc. A number of visits on several markets of Rangpur division (Figure 1) were carried out during the period from April 2012 to September 2012 considering the illegal marketing of turtles and tortoises in those areas. Six markets namely Jagannath *hat*, Panchagarh; Ramgonj Bazar, Nilphamari; Velapir Bazaar, Saidpur, Nilphamari; Farmer *hat*, Dinajpur; Paker *hat*, Khansama, Dinajpur; Khochabari *hat*, Ruhia, Thakurgaon were selected to market survey to obtain information about the marketing of freshwater turtles and tortoises in the respective areas.

A total of 30 people were selected for questionnaire interviews in different areas. It is noted *hat* in each market around 2-7 retailers were involved. Among them respondents were selected for questionnaire interviews through simple random sampling method (Table 1).

The data were collected using questionnaire interviews and crosscheck interview with key informants. It was very difficult to collect data since freshwater turtle and tortoise traders did not keep written records on freshwater turtle and tortoise marketing activities and data which they provided were mostly from their memory. Data collection methods can be divided into 3 steps: questionnaire interviews with freshwater turtle and tortoise retailers, focus group discussion with intermediaries and cross-check interviews with key informants. Some problems were confessed during interview such as: retailers were busy in trading and unwilling to talk, they thought the researchers to be the government official of tax or other department and feared

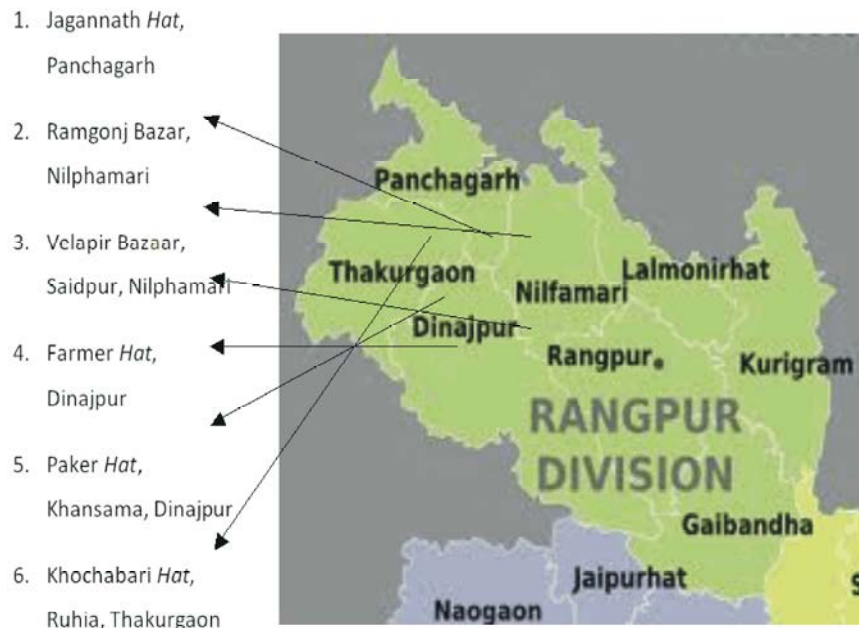


Fig. 1: Map of the study area in Bangladesh.

Table 1: Sample sizes in different markets

Study Area	No. of Retailers	No. of Consumers	No. of Aratders
Jagannath <i>hat</i> , Debiganj, Panchagarh	3	7	Nil
Ramgonj Bazaar, Nilphamari	2	5	1
Velapir Bazaar, Saidpur, Nilphamari	2	4	1
Firmer <i>hat</i> , Dinajpur	1	Nil	Nil
Paker <i>hat</i> , Khansama, Dinajpur	1	Nil	Nil
Khochabari <i>Hat</i> , Ruhia, Thakurgaon	1	2	Nil

✓ Nil indicates that the absence of retailers, consumers and aratders in the respective area.

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. Clarification of local terminologies and local units were obtained from key informants during cross check interviews. After collection, the 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 into international units before transferring to the computer. Preliminary data sheets (in computer) were compared with the original questionnaire and result sheets to ensure the accuracy of the data entry. Data were processed and finally analyzed using Microsoft Excel and SPSS.

## RESULTS AND DISCUSSION

### Freshwater Turtle and Tortoise Marketing Systems:

There were a number of middlemen involved in freshwater turtles and tortoises marketing systems. The market chain from freshwater turtle and tortoise collectors to consumers passes through a number of intermediaries: forias/agents, wholesalers and retailers (Figure 2). The demand of freshwater turtles and tortoises was high in different markets of Rangpur division, Bangladesh and a strong secret network has developed

with brokers and retailers intervening between freshwater turtle and tortoise collectors at one end and the consumers, at the other end.

Tortoises were caught from Haribhanga, Chaprar, Nandair and Bhelakoba *beel*, Besides Jamuneshwari, Chirnai, Katgara, Chikli River under Rangpur District are some of the place where freshwater turtle and tortoise are found. In addition, collectors catch tortoises from Karatoa River, Atrai River, Tista River etc. and associated canals and beels of Panchagarh, Dinajpur, Nilphamari, Thakurgaon. Agents or suppliers called forias carried freshwater turtles and tortoises by vans, boats, buses, trucks, tempos, pickups or even rickshaws and sold them to aratders or wholesalers. Agents or suppliers typically earned 5-10% commission for their services [6]. Aratders or wholesalers then sold freshwater turtles and tortoises to the retailers. Retailers sold freshwater turtles and tortoises to the local consumers. Sometimes suppliers took small amounts of dadon (credit) from wholesalers to ensure the supply of freshwater turtles and tortoises. Retailers commonly used vans, boats, buses, trucks, tempos, pickups or even rickshaws to transport the freshwater turtles and tortoises to the local markets, which took 40 minutes to 3 hours depending on market distance. Retailers typically operate with capital of around Tk. 5,000 to 10,000 per day of market. The wholesalers possess more capital (around Tk. 20,000 to 30,000 per day of

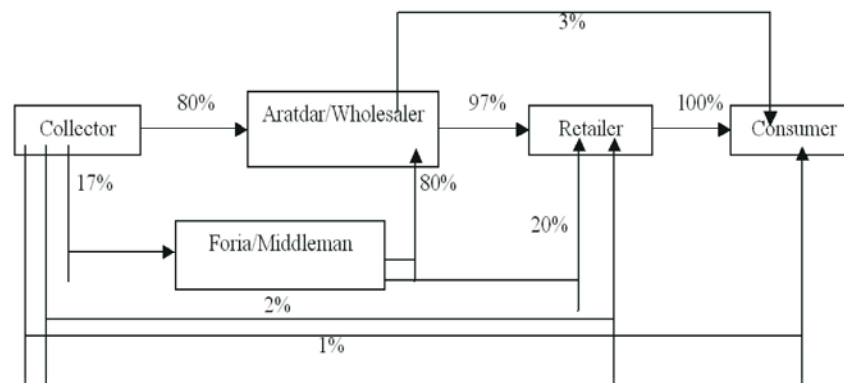


Fig. 2: Freshwater turtle and tortoise distribution chain from collectors to consumers in Rangpur.

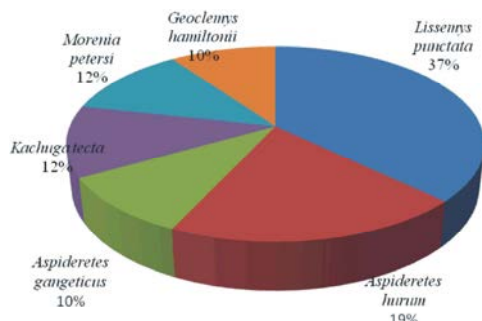


Fig. 3: Percent composition of different freshwater turtles and tortoises in Jagannath Hat, Panchagarh.

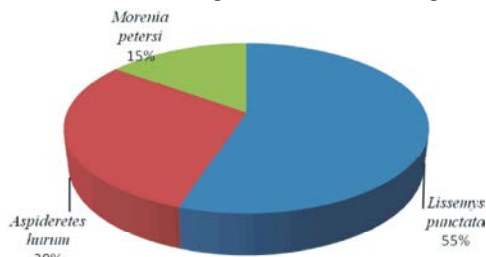


Fig. 4: Percent composition of different freshwater turtles and tortoises in Ramgonj Bazaar of Nilphamari.

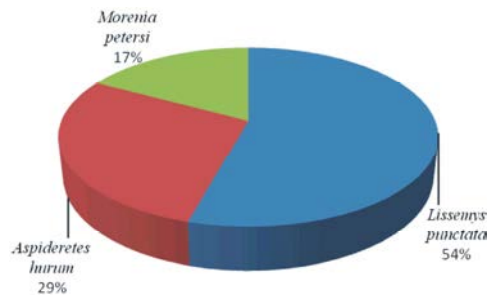


Fig. 5: Percent composition of different freshwater turtles and tortoises in Velapir Bazaar under Saidpur Upazila of Nilphamari.

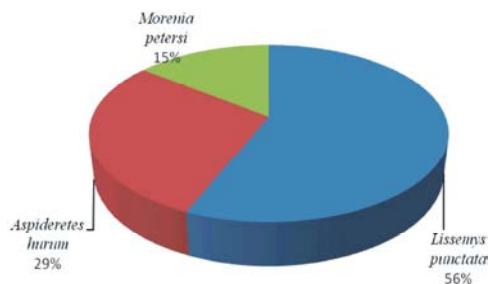


Fig. 6: Percent composition of different freshwater turtles and tortoises in Khocharir hat, Ruhia, Thakurgaon.

market) than retailers and have the means to control agents and retailers. Sometimes wholesalers also work as retailers and have stall in markets.

#### Supply of Freshwater Turtles and Tortoises in Markets:

The supply of freshwater turtles and tortoises into various markets of Rangpur division mainly comes from Narayangonj, Comilla, Bhairab, Patuakhali, Bhola, Barisal, Sylhet, Hill Tracts of Chittagong and some other few places. The supply of freshwater turtles and tortoises to different markets of Nilphamari, Thakurgaon also comes from nearby *beels* and rivers of Rangpur, Nilphamari, Dinajpur, Panchagarh, Thakurgaon and from different places of southeast region of Bangladesh. Freshwater turtles and tortoises seemed to be accepted by non Muslims of those areas. Statistics on freshwater turtles and tortoises sale and supply were not available but according to market survey, the supply of freshwater turtles and tortoises in Jagannath hat under Debigonj Upazila of Panchagarh, Ramgonj Bazaar of Nilphamari, Velapir Bazaar under Saidpur Upazila of Nilphamari and Khocharir hat under Ruhia Upazila of Thakurgaon had been estimated to be 110-150 kg, 30-50 kg, 20-40 kg and 20-50 kg respectively during each market day. It was estimated that 60% of the freshwater turtles and tortoises per market day sold in different markets were soft shell turtles, e.g. *Lisssemys punctata*, *Aspideretes hurum*, *Aspideretes gangeticus* (Figures 3, 4, 5 and 6). Besides the soft shell turtles, small quantities of other freshwater turtles and tortoises, e.g. *Kachuga tecta*, *Morenia petersi*, *Geoclemys hamiltonii* were sold in the markets.

More freshwater turtles and tortoises were generally consumed during festivals. During *Pahela Boisakh* in April and Pujas of Hindu community such as *Durga Puja*, *Kali Puja* the demand of freshwater turtles and tortoises became higher that lead the price of freshwater turtles and tortoises to be higher than other months. Fig. 7 (a, b, c, d) shows different freshwater turtle and tortoise species found during the survey.

#### Season and Time of Freshwater Turtle and Tortoise Trading:

The season of freshwater turtles and tortoises trading was around the year. In Jagannath hat under Debigonj Upazila of Panchagarh retailers were engaged in freshwater turtle and tortoise trading from 3 pm to 8 pm, while in Velapir Bazaar under Saidpur Upazila of Nilphamari and Khocharir hat under Ruhia Upazila of Thakurgaon 3 pm to 6 pm. Retailers in Jagannath hat under Debigonj Upazila of Panchagarh spend more time due to higher amount of freshwater turtles and tortoises supply and large number of consumers bought freshwater turtles and tortoises from this market. The number of freshwater turtles and tortoises retailers, suppliers and day laborers were also higher in this market than other markets.

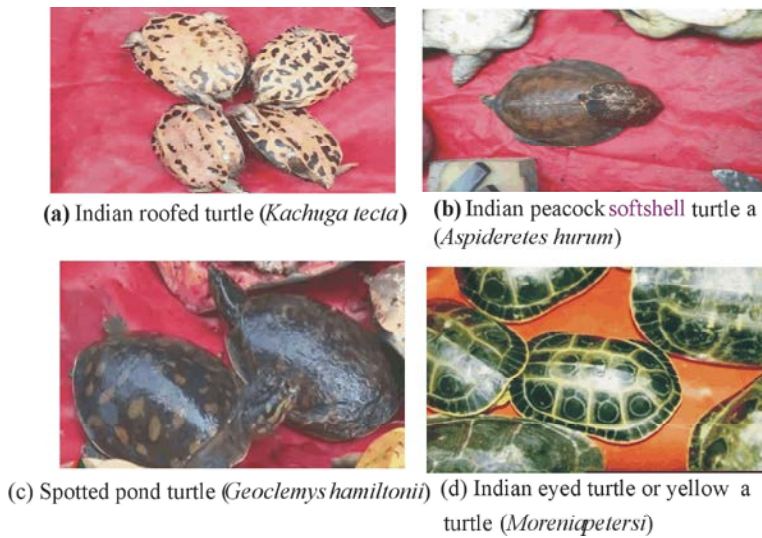


Fig. 7: (a,b,c,d) shows different freshwater turtle and tortoise species found during the survey.

Table 2: Price of different species in four retail markets

Species	Jagannath Hat, Panchagarh (Tk/Kg)	Ramgonj Bazaar, Nilphamari (Tk/Kg)	Velapir Bazaar, Saidpur, Nilphamari (Tk/Kg)	Khochabarir Hat, Ruhia, Thakurgaon (Tk/Kg)
Indian flap shell turtle ( <i>Lissemys punctata</i> )	400-450	350-400	350-400	400
Indian peacock soft shell turtle ( <i>Aspideretes hurum</i> )	500-600	600-700	600-700	600-700
Indian soft shell turtle ( <i>Aspideretes gangeticus</i> )	400-500	Nil	Nil	Nil
Indian eyed turtle or yellow turtle ( <i>Morenia petersi</i> )	200-300	200-300	200-300	200-300
Indian roofed turtle ( <i>Kachuga tecta</i> )	200-220	Nil	Nil	Nil
Spotted pond turtle ( <i>Geoclemys hamiltonii</i> )	200-250	Nil	Nil	Nil

Nil indicates absence of respective species in the specific markets.

#### Amount of Freshwater Turtles and Tortoises Sold:

According to the survey, it was found that a freshwater turtle and tortoise retailer of Jagannath Hat under Debiganj Upazila of Panchagarh, Ramgonj Bazar of Nilphamari, Velapir Bazaar under Saidpur Upazila of Nilphamari, Khocharir Hat under Ruhia Upazila of Thakurgaon district sold an average 20 kg, 14 kg, 15 kg and 12 kg freshwater turtles and tortoises per market day respectively. There around 7 retailers were involved in Jagannath Hat under Debiganj Upazila of Panchagarh, 3 in Ramgonj Bazaar of Nilphamari, 2 in Velapir Bazaar under Saidpur Upazila of Nilphamari, 3 in Khocharir Hat under Ruhia Upazila of Thakurgaon district (Figure 7). The supply of freshwater turtles and tortoises in Jagannath Hat under Debiganj Upazila of Panchagarh, Ramgonj Bazaar of Nilphamari, Velapir Bazaar under Saidpur Upazila of Nilphamari, Khocharir Hat under Ruhia Upazila of Thakurgaon district in a market day were about 110-150 kg (average 7 retailers  $\times$  19 kg), 30-50 kg (average 3 retailers  $\times$  14 kg), 20-40 kg (average 2 retailers  $\times$  13 kg), 20-50 kg (average 3 retailers  $\times$  11 kg) respectively.

#### Price of Some Freshwater Turtles and Tortoises Species:

There were different species of freshwater turtles and tortoises such as Indian flap shell turtle (*Lissemys punctata*), Indian roofed turtle (*Kachuga tecta*), Spotted pond turtle (*Geoclemys hamiltonii*), Indian soft shell turtle (*Aspideretes gangeticus*), Indian peacock soft shell turtle (*Aspideretes hurum*), Indian eyed turtle or yellow turtle (*Morenia petersi*) were available in four markets (Table 3). Due to limited secondary data, it had not been possible to do any proper price analysis. The price of freshwater turtles and tortoises was comparatively higher in the Jagannath Hat under Debiganj Upazila of Panchagarh than other markets. Table 2 showed average price of different species of freshwater turtles and tortoises in four markets.

**Species Selection:** The average number of species that occurred in these four markets was 3-6. Among these only 3 species were selected for their availability, demand, market price and consumer's choice and observed the monthly (April to September) price fluctuation in the markets. The selected 3 species from the present study were:

Table 3: Availability of different species of freshwater turtles and tortoises in four retail markets

Species	Jagannath hat, Panchagarh	Ramgonj Bazaar, Nilphamari	Velapir Bazaar, Nilphamari	Khochabarir hat, Ruhia, Thakurgaon	Availability
Indian flap shell turtle ( <i>Lissemys punctata</i> )	✓	✓	✓	✓	Common
Indian peacock soft shell turtle ( <i>Aspideretes hurum</i> )	✓	✓	✓	✓	Common
Indian soft shell turtle ( <i>Aspideretes gangeticus</i> )	✓	-	-	-	Rare
Indian eyed turtle or yellow turtle ( <i>Morenia petersi</i> )	✓	✓	✓	✓	Few
Indian roofed turtle ( <i>Kachuga tecta</i> )	✓	-	-	-	Common
Spotted pond turtle ( <i>Geoclemys hamiltonii</i> )	✓	-	-	-	Few

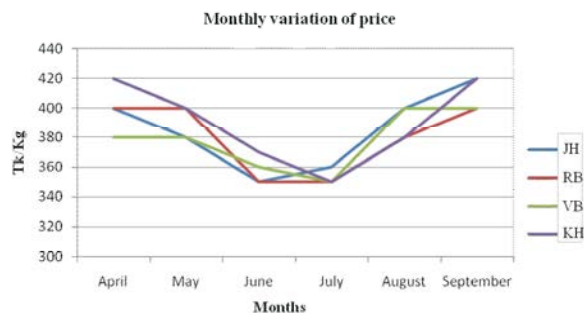
✓ = Yes; - = No (Based on survey)

Table 4: Price (taka) of *Lissemys punctata* in four retail markets from April to September

Markets	April	May	June	July	August	September
Jagannath hat	400	380	350	360	400	420
Ramgonj bazaar	400	400	350	350	380	400
Velapir bazaar	380	380	360	350	400	400
Khochabari hat	420	400	370	350	380	420

Table 5: Price (taka) of *Aspideretes hurum* in four retail markets from April to September

Markets	April	May	June	July	August	September
Jagannath hat	650	550	550	500	600	650
Ramgonj bazaar	550	500	600	650	650	700
Velapir bazaar	650	600	500	550	650	650
Khochabari hat	600	600	550	500	700	700

Fig. 8: Monthly variation of price of *Lissemys punctata* in the four retail markets.Fig. 9: Monthly variation of price of *Aspideretes hurum* in four retail markets.

- Indian flap shell turtle (*Lissemys punctata*)
- Indian peacock soft shell turtle (*Aspideretes hurum*)
- Indian eyed turtle or yellow turtle (*Morenia petersi*)

#### Indian flap shell turtle (*Lissemys punctata*)

In the present study *Lissemys punctata* was the most common (100% of all visits). *L. s punctata* was adapted to a variety of habitats. The ability of *L. punctata* to adapt to the various manmade and altered habitats may be a reason for its abundance. Because of the wide distribution and availability of *L. punctata*, it was consumed on most occasions by non Muslims. It was estimated that most of the ethnic groups in the northeast, northwest and southeast consume at least one *L. punctata* per week per household. The price of Indian flap shell turtle (*L. punctata*) ranged from 350-450 Tk. /kg. Table 4 and Figure 8 show the monthly price fluctuation in the markets.

#### Indian peacock soft shell turtle (*Aspideretes hurum*)

Indian peacock soft shell turtle (*Aspideretes hurum*) was demanded due to its high delicious flesh. The price of Indian soft shell turtle ranged from 500-700 Tk. /kg. Table 5 and Figure 9 show the monthly price fluctuation in the markets.

#### Indian eyed turtle or yellow turtle (*Morenia petersi*)

It was found that consumers can afford easily Indian eyed turtle or yellow turtle (*Morenia petersi*) as its price was less. The average price ranged from 200-250 Tk. /kg. Table 6 and Figure 10 show the monthly price fluctuation in the markets.

Table 6: Price (taka) of *Morenia petersi* in four retail markets from April to September

Markets	April	May	June	July	August	September
Jagannath hat	250	200	200	220	230	250
Ramgonj bazaar	220	210	200	200	220	230
Velapir bazaar	200	210	200	200	210	220
Khochabari hat	230	220	210	220	220	250

Fig. 10: Monthly variation of price of *Morenia petersi* in the four retail markets.

Bangladesh government has banned turtle trade locally and internationally from 1998 under Bangladesh Wildlife Conservation Amendment Act 1974. Provision of punishment has been prescribed under Article-26 of the said Order. As per nature of wildlife crime, minimum punishment to fine Tk. 500, with or without 6 months imprisonment and maximum fine to Tk. 2000 with or without 2 years imprisonment. But law enforcement activity was not found in Rangpur division during the present study. So to save this species from extinction forest department should monitor markets and apply law strongly.

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