

Wildlife business in Bangladesh: Its impacts on nature and conservation issues



A DISSERTATION

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DEDICATED TO
THE PEOPLE OF BANGLADESH

DECLARATION

I, do hereby, declare that the work presented in this thesis entitled “Wildlife business in Bangladesh: Its impacts on nature and conservation issues” is the result of my own investigation and to the best of my knowledge it contains no materials previously published or written by another person. Any contribution made to the research by others, with whom I have worked in the University of Dhaka or elsewhere, is acknowledged in this thesis.

I further declare that this thesis has been composed by myself and no part of this thesis has been submitted anywhere in any form for any academic degree.

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CERTIFICATE

I, hereby, declare that the dissertation entitled “Wildlife business in Bangladesh: Its impacts on nature and conservation issues” submitted by A. N. M. Maruf Abdullah to the Department of Zoology, University of Dhaka for the degree of Doctor of Philosophy (Ph.D.) is based on self-investigation carried out under my supervision and guidance.

I also declare that this work or any Part of this work has not been submitted to any other institute or University for the award of any degree.

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ABSTRACT

A study on the wildlife business, its impacts in nature and conservation issues was conducted in Bangladesh during January 2011 to June 2016. Twelve organized wildlife trading shops and 40 unorganized spots were detected in the country. A total of 17,11,905 individuals belonging to 74 species to be sold. Among the recorded species, 57 (78.08%) were indigenous and 17 (21.92%) were exotic. Among the individuals, 64.17% were indigenous and 35.83% were exotic. The highest number of both species (45.61%) and individuals (75.72%) were belonging to birds' species. Nearly cent percent (99.29%) were live wildlife and small proportion (0.71%) were their trophies. Large number of threatened species (43.86%) were found in traded animals. A total BDT 1,34,96,13,605 (One hundred thirty-four crore ninety-six lac thirteen thousand six hundred five taka only) (1,76,83,616.42 USD) was transacted against indigenous animal trade where BDT 39,75,585 (52,091USD) were transacted against amphibians, BDT 24,73,41,600 (32,40,849.05USD) were against reptiles, BDT 55,64,56,970 (72,91,102.86USD) were against birds and BDT 54,18,39,450 (70,99,573.51USD) were transacted against mammals. Among the sold indigenous animals, birds were taken by the consumers at the highest rate (41.23%). The sale of individuals was the highest (31.69%) in 2011 and the lowest (19.38%) in 2014. Both organized and unorganized traders were active. Most of the dealers were belonging to under low-income ranges (40.78%). Total of 31,752 persons were recorded to be rescued by the law enforcing agencies. From 2012 to 2016, 273 cases were recorded by Bangladesh Police, 413 wildlife dealers and trades were arrested and were put to sentence. Alternative income source may reduce the attraction to wildlife business which was found in case of snake charmers in Savar where 70 women and 32 men were rehabilitated. In 2016, wildlife business became reduce than that in 2011 due to initiating conservation activities both in reactive and proactive way which included enforcing law by Bangladesh Forest Department, Police and other agencies, to rehabilitate snake charmers and to raise awareness among the people.

CONTENTS

	Page
Acknowledgement	i-ii
Abstract	iii
Contents	iv-vii
Tables	viii
Figures	ix
Plates	x-xii
 Chapter- 1: Introduction	 1-6
1.2. General aims of the research work	6
1.3. Specific objectives of the research work	6
 Chapter- 2: Materials and Methods.....	 7-11
2.1. Materials	7
2.1.1. Study area.....	7
2.1.2. Study period.....	7
2.1.3 Materials used	7
2.2. Methods.....	8
2.2.1 Detection of wildlife spots	8
2.2.2 Sources of wildlife collection	8
2.2.3 Wildlife business links	8
2.2.4 Assessed wildlife exploitation and its impacts in nature	8
2.3 Identification of wildlife species	9
2.4 Data preparation	9
2.5 Data analysis	9
2.6 Conservation issues	10
2.6.1 Reactive way	10
2.6.2 Proactive way	10
2.6.2.1 Rehabilitated dealers at Bakterpur village, Savar	10
2.6.2.2 Awareness was raising	11
	Page

Chapter- 3: Result and Discussion	12-44
3.1 Wildlife business spots in Bangladesh and people involved	12
3.1.1 Dhaka University market, Kataban	13
3.1.2 Kaptan Bazar, Dhaka	13
3.1.3 Shakhari Bazar, Dhaka	13
3.1.4 Bakterpur (Snake charmers' village), Savar, Dhaka	13
3.1.5 Tongi Bazar, Gazipur	13
3.1.6 Reazuddin Bazar, Chittagong	14
3.1.7 Bandarban Sadar Bazar	14
3.1.8 Upazila Bazar, Sadar Upazila, Gopalganj.....	14
3.1.9 Upazila Bazar, Kotalipara Upazila, Gopalganj	14
3.1.10 Mohangonj Sadar Bazar, Netrokona	14
3.1.11 Sundarbans in Dacope Upazila, Khulna	15
3.1.12 Sadar Upazila, Bagerhat.....	15
3.2 Locations of unorganized traders	15
3.3 Wildlife species dealt with and their sources of collection	15
3.4 National and international channels of wildlife business	16
3.5 Impact on nature	18
3.6 Conservation steps taken for	23
3.6.1. Reactive way	23
3.6.2 Proactive way	24
3.6.2.1 Rehabilitated dealers at Bakterpur village, Savar	24
3.6.2.2 Awareness was raised among the young generation and law enforcing agencies	25
3.7 Cost of sold animals	26
3.8 Trade of individuals according to class of wildlife	26
3.8.1 Amphibians	26
3.8.2 Reptiles	27
3.8.3 Birds	30
3.8.4 Mammals	30
3.9 Yearly variation of trade of wildlife	32
3.10 Status of Indigenous species	32
	Page

3.10.1 Status of Indigenous species according to IUCN Red list	32
3.10.2 Status of Indigenous species according to CITES appendices ..	33
3.11 Indigenous wildlife (Trophy or Whole body)	33
3.12 Purpose of business on wildlife	34
3.12.1 As food	34
3.12.2 For entertainment	35
3.12.3 As Hobby	35
3.12.4 For Poaching	36
3.12.5 As Medicine	36
3.13 Economic Aspect	37
3.13.1 Sale of Indigenous wildlife	37
3.13.2 Yearly variation of the sale of Indigenous wildlife	37
3.13.3 Sale of Indigenous and Exotic wildlife	38
3.14 Number of traders	38
3.14.1 Organized traders	38
3.14.2 Unorganized traders	38
3.15 Financial condition of dealers	38
3.16 Significance test (two proportionate z-test)	40
3.17 Legal strength of combating Wildlife offense in Bangladesh	42
3.17.1 Stake holders of combating Wildlife crime	42
3.17.2 Challenges	43
List of Tables	44-51
List of Figures	52-62
List of Plates	63-99
Chapter 4. Summary and Conclusion	100-103
4.1 Summary	100
4.1.1 Wildlife business markets and spots	100
4.1.2 Illegal wildlife trade from 2011 to 2014	100
4.1.3 Trade value of wild animals	100
4.1.4 Trading of wildlife from 2011 to 2014	101
4.1.5 Intention of wildlife trade	101
	Page

4.1.6 Sale of Indigenous wildlife	101
4.1.7 Wildlife traders	101
4.1.8 Smuggling routes	101
4.1.9 Conservation	102
4.2 Conclusion.....	103
 Chapter- 5: Recommendations	 104
 Chapter- 6: References	 105-116
 Chapter- 7: Appendices	 117-145

Tables

Serial no.	Subject	Page
Table- 1:	Location of the organized trade markets in Bangladesh	44
Table- 2:	Location of unorganized traders in Bangladesh	45
Table- 3:	Overall number of species and their numbers were ready to sell in the market during 2011-2014	46
Table- 4:	Total List of sold individuals and species according to groups in the study period (2011-2014)	47
Table- 5:	Wildlife recovered from different operations during 2012 to 2016	49
Table- 6:	Z-test 2011-2012	49
Table- 7:	Z-test 2012-2013	50
Table- 8:	Z-test 2013-2014	50
Table- 9:	Z-test 2011-2014	51
Table- 10:	Sale of Indigenous wildlife from 2011 to 2014	51

Figures

Serial no.	Subject	Page
Figure- 1:	Population of traded indigenous wildlife according to species diversity	52
Figure- 2:	Selling of passerine bird species	52
Figure- 3:	Status of the population of Indigenous species according to IUCN (Threatened list)	53
Figure- 4:	Trading of Snake species	53
Figure- 5:	Business of Turtle species	54
Figure- 6:	Business of birds according to species	54
Figure- 7:	Selling of passerine bird species	55
Figure- 8:	Trade of Mammals species	55
Figure- 9:	Trade of Carnivore Mammals species	56
Figure- 10:	Wildlife trade in different years according to group	56
Figure- 11:	Status of Indigenous species according to IUCN (Threatened) list	57
Figure- 12:	Status of Indigenous species according to CITES appendices	57
Figure- 13:	Sale of Indigenous wildlife (Trophy)	58
Figure- 14:	Causes of Trade of wildlife	58
Figure- 15:	Causes of Trade of wildlife (Food aspect)	59
Figure- 16:	Causes of Trade of wildlife (Poaching)	59
Figure- 17:	Causes of Trade of wildlife (Medicine)	60
Figure- 18:	Sale of Indigenous wildlife groups	60
Figure- 19:	Yearly variation of the sale indigenous wildlife groups	61
Figure- 20:	Organized trader groups	61
Figure- 21:	Unorganized traders groups	62
Figure- 22:	Economic Status	62

Plates

Serial no.	Subject	Page
Plate- 1:	Rapid Action Battalion (RAB) rescued snakes at Keranigonj, Dhaka	63
Plate- 2:	Police rescued and released a fishing cat in Magura	63
Plate- 3:	Lion and leopard cubs were rescued by Jessore police while poaching	64
Plate- 4:	Satellite image of Dhaka University market at Kataban in Dhaka	64
Plate- 5:	Satellite image of Kaptan Bazar, Dhaka	65
Plate- 6:	Satellite image of Shakhari Bazar turtle selling centre, Dhaka	65
Plate- 7:	Satellite image of Bakterpur (Snake charmers" village), Savar, Dhaka	66
Plate- 8:	Satellite image of Tongi Bazar, Gazipur	66
Plate- 9:	Satellite image of Reazuddin Bazar, Chittagong	67
Plate- 10:	Satellite image of Bandarban Sadar Bazar	67
Plate- 11:	Satellite image of Sadar Upazila turtle selling point, Gopalganj	68
Plate- 12:	Satellite image of Kotalipara Upazila turtle selling point, Gopalganj	68
Plate- 13:	Satellite image of Mohangonj Sadar Bazar turtle selling point, Netrokona	69
Plate- 14:	Satellite image of Sunderban at Dacope Upazila in Khulna	69
Plate- 15:	Satellite image of Sadar Upazila animal selling point, Bagerhat	70
Plate- 16:	Inauguration programme of sewing training for the young women at Snake Charmers village in Savar, Dhaka	70
Plate- 17:	Distribution of sewing machine among the female members of snake charmers by the Police Super of Dhaka District Mr. Habibur Rahman in Savar, Dhaka	71
Plate- 18:	Inauguration ceremony of driving training among the male snake charmers in Savar, Dhaka	71
Plate- 19:	Snake charmers left their old profession and took training on sewing for new chapter of life in Savar, Dhaka	72
Plate- 20:	An example of entrepreneurship and conservation programme against snake selling in Savar, Dhaka	72
Plate- 21:	Snake charmers is working in „Uttaran" factory in Savar, Dhaka	73
Plate- 22:	Insight of the factory „Uttaran	73
Plate- 23:	Awareness programme conducted among the students of Shahid Police Smriti School & College Mirpur, Dhaka	74
Plate- 24:	Leaflet and Poster distribution	74
Plate- 25:	Leaflet for raising the awareness	75
Plate- 26:	Poster for raising awareness	75
Plate- 27:	Selling of frogs and toads in Bandarban Sadar Bazar	76
Plate- 28:	Turtles were sold in Shakhari Bazar, Dhaka	76

Serial no.	Subject	Page
Plate- 29:	Rat Snake (<i>Ptyas mucosa</i>) was displayed in Bakterpur, Savar, Dhaka	77
Plate- 30:	Displaying Ornate Flying Snake (<i>Chrysopelea ornata</i>) in Bakterpur, Savar, Dhaka	77
Plate- 31:	Tokay Gecko (<i>Gekko gekko</i>) captured in Dhaka	78
Plate- 32:	Rat Snake (<i>Ptyas mucosa</i>) is showing in Bakterpur, Savar, Dhaka	78
Plate- 33:	Binocellate Cobra (<i>Naja naja</i>) is being displayed in Bakterpur, Savar, Dhaka	79
Plate- 34:	Monocellate Cobra (<i>Naja kaouthia</i>) was displayed in Bakterpur, Savar, Dhaka	79
Plate- 35:	Common Vine Snake (<i>Ahaetulla nasuta</i>) was shown to the customers in Bakterpur, Savar, Dhaka	80
Plate- 36:	Common Sand Boa (<i>Eryx conicus</i>) in the snake market shown to the customers in Bakterpur, Savar, Dhaka.	80
Plate- 37:	Indian Roofed Turtle (<i>Pangshura tecta</i>) in a shop at Kataban, Dhaka	81
Plate- 38:	Turtle recovered at Shahjalal International Airport while poaching	81
Plate- 39:	Black Headed Munia (<i>Lonchura Malacca</i>) in Kataban, Dhaka	82
Plate- 40:	Rose-ringed Parakeet (<i>Psittacula krameri</i>) in a shop at Kaptan Bazar, Dhaka	82
Plate-41:	Spotted Dove (<i>Spilopelia chinensis</i>) in a shop at Kaptan Bazar in Dhaka	83
Plate- 42:	Blossom-headed Parakeet (<i>Psittacula roseate</i>) kept in a shop at Kataban, Dhaka	83
Plate- 43:	Red-breasted Parakeet (<i>Psittacula alexandri</i>) was sold on a street in Dhaka	84
Plate- 44:	Purple Swampphen (<i>Porphyrio porphyria</i>) captured in Gopalganj	84
Plate- 45:	Selling of Hill Myna (<i>Gracula religiosa</i>) in Chittagong	85
Plate- 46:	Five-striped Palm Squirrel (<i>Funambulus pennantii</i>) in a shop at Kaptan Bazar, Dhaka	85
Plate- 47:	Rhesus Monkey (<i>Macaca mulatta</i>) recovered in Dhaka	86
Plate- 48:	Rufous-tailed Hare (<i>Lepus nigricollis</i>) in a shop at Kataban, Dhaka	86
Plate- 49:	Irrewaddy Squirrel (<i>Callosciurus pygerythrus</i>) hunted by in Bandarban	87
Plate- 50:	Jungle Cat (<i>Felis chaus</i>) hunted in Netrokona	87
Plate- 51:	Fishing Cat (<i>Prionailurus viverrinus</i>) was hunted in Bagerhat	88
Plate- 52:	Jungle Cats (<i>Felis chaus</i>) are ready to burn by ethnic people in Naogaon	88
Plate- 53:	An animal hunter of an ethnic group in Naogaon district	89
Plate- 54:	Skin of Pangolin (<i>Manis crassicaudata</i>) recovered in Dhaka	89
Plate- 55:	Spotted Deer (<i>Axis axis</i>) skin recovered by Bagerhat district Police	90
Plate- 56:	Skins of Spotted Deer (<i>Axis axis</i>) wer recovered by Rapid Action Battalion (RAB)	90
Plate- 57:	Trophy of different animals	91

Serial no.	Subject	Page
Plate- 58:	Bengal Tiger (<i>Panthera tigris</i>) skin recovered by Bangladesh Forest Department	91
Plate- 59:	Turtle selling in Shakhari Bazar, Dhaka	92
Plate- 60:	Ethnic people burning Jungle Cat (<i>Felis chaus</i>) for food in Naogaon district	92
Plate- 61:	Rhesus Monkey (<i>Macaca mulatta</i>) used for the entertainment of the people in the street of Dhaka	93
Plate- 62:	Snake Charmers playing with snake in Bakterpur, Savar, Dhaka.	93
Plate- 63:	Binocetele Cobra (<i>Naja naja</i>) is being displayed by a snake charmer in Bakterpur, Savar, Dhaka	94
Plate- 64:	Skins of Spotted Deer (<i>Axis axis</i>) were recovered by Bagerhat district Police	94
Plate- 65:	Bird selling at Dhaka University market, Kataban, Dhaka	95
Plate- 66:	Seller and buyer in a shop of Kaptan Bazar, Dhaka	95
Plate- 67:	Snake Charmers show snake to the buyer in Bakterpur, Savar, Dhaka	96
Plate- 68:	Turtle seller arrested in Dhaka by Police	96
Plate- 69:	Dealer arrested by RAB while transporting different species of snakes at Bosila housing in Dhaka	97
Plate- 70:	A street seller with Parakeets and Bayas in Dhaka	97
Plate- 71:	Spotted Dove in a local market of Khulna	98
Plate- 72:	A local so called medicine seller having trophy of different animals in Dhaka	98
Plate- 73:	Tools for hunting wildlife by local poachers in Bagerhat	99

CHAPTER 1: INTRODUCTION

The wildlife business refers to the sale and exchange of wild animals and plants, and products made from them (Martini, 2013). This business consists of any environmental-related crime that involves the illegal handling, smuggling, poaching, capture or collection and transaction of endangered species, protected wildlife including animals and plants that are subjected to harvest quotas and regulated permits, derivatives or products thereof (South and Wyatt, 2011). Crimes therefore refer to act committed in contravention of national law, and at the international level, to violations of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

The business in wildlife and wildlife related products is a booming business around the world involving hundreds of millions of plants and animals every year (Sullivan, 2003). It is one of the most profitable illegal trade of the world. INTERPOL estimates the illegal wildlife trade at approx. USD 10-20 billion per year (Wikipedia, 2014).

In Bangladesh organized illegal business on wild animals is occurring mostly in Dhaka, Chittagong, Pabna, Rangpur and other parts of the country (Sarker and Abdullah, 2009a). This business is one of the effective threats to a large number of indigenous species in the country. (Sarker and Abdullah, 2009a).

The international trade in wildlife is a serious conservation problem. Globally, wildlife trade is the second largest illegal trade in volume, and comes only next to narcotics and is followed by arms and ammunition. It's the most serious threat to a number of endangered and vulnerable species (Wikipedia, 2008). Illegal wildlife trade totals billions of dollars a year globally, but conservationists say the problem is most acute in Southeast Asia (Sullivan, 2003). Despite international and local laws designed to crack down on the trade, live animals and animal parts often those of endangered or threatened species are sold in open-air markets throughout the region (Sullivan, 2003). The illegal trade in wildlife constitutes not only a very significant criminal sector, involving organized crime, violent conflicts and terrorism, but it also entails poverty, development and governance challenges. Of particular relevance is the increasing involvement of

transnational organized criminal networks in the illegal trade of wildlife, as well as the significant impact to the environment and sustainable development (Nellemann *et al.*, 2014).

International trade in wildlife threatens biodiversity because it can result in habitat destruction, overexploitation of wildlife, and the spread of invasive alien species (Gerson *et al.*, 2008).

Wildlife business is illegal in most of the cases. World Wildlife Fund for nature (WWF) plays an important role against fighting illegal business, most significantly through the world's largest wildlife business monitoring network called TRAFFIC (Wikipedia, 2008). This organization is founded in 1976 by World Wildlife Fund (WWF) and International Union for Conservation of Nature (IUCN). TRAFFIC operates a world-wide network of 25 offices. It conducts pioneering work on species in trade, policy impacts and market dynamics to ensure that the Convention on International Trade in Endangered Species (CITES), is effective in regulating and protecting animals and plants sold in the international market place. TRAFFIC is dedicated to ensuring that trade in wild plants and animals is not a threat to the conservation of nature (Wikipedia, 2008).

The international trade in wildlife is addressed by the United Nation's CITES which currently has 170 member countries or Parties (Wikipedia, 2008). CITES an international regulating body covering most of the countries in the world, was developed in response to declining wildlife populations due to over-exploitation for international business, but there remains much work to be done. In spite of CITES exists, the most powerful organization, the business is going on, especially in third world country (Wikipedia, 2008). Evidence suggests that the illegal trade in wild animal products is controlled by groups of criminal networks specialized in trafficking illegal commodities across borders. These traders have a substantial grip on the market for wildlife commodities and earn high profits by exercising control over supplies and prices. Thus, the illegal trade in endangered species is characterized by imperfect competition (Erwin and Richard, 2005). International trade in wildlife threatens biodiversity because it can result in habitat destruction, overexploitation of wildlife, and the spread of invasive alien species. Although traders are required to report goods, including wildlife, to border

authorities when the goods are moved across international borders, customs authorities do not have mandatory, standardized reporting requirements for species information system in third world countries (Gerson *et al.*, 2008). Thus, authorities cannot capture species-specific data in a form that is accurate, accessible, standardized, retrievable, or separable from confidential client information (Gerson *et al.*, 2008). Due to over exploitation and illegal trade of wildlife, the world is now facing the imbalance of ecosystem, environmental degradation and economical loss. At present time, different, rare, endangered, critically endangered animals are going to be extinct due to the unwise and non-scientific use (Sarker and Abdullah, 2009a).

The illegal trade in wildlife is a serious and growing international problem (INTERPOLE, 2010). While its actual value and extent are largely unknown due to lack of up-to-date and reliable analysis, the impact is felt around the world with the loss of biodiversity and critical habitat. The reasons for smuggling are many and varied, including owning something exotic and unusual, profiting from the breeding of desirable and rare species, obtaining new bloodlines and circumventing health restrictions (INTERPOLE, 2010).

Environmental crime by nature is often cross-border in character (INTERPOLE, 2010). This is primarily because many of the treaties and laws that have been put in place to conserve and protect our planet's ecosystem focus on the regulation of the international trade in natural resources and potentially polluting commodities such as wildlife, fish, timber, chemical products, and waste (INTERPOLE, 2010). It is therefore, nearly impossible to effectively enforce those laws and regulations in one country without effective cooperation and information sharing with counterparts abroad (INTERPOLE, 2010).

Globally, overexploitation of wildlife resources is a key threat to biodiversity conservation, much of which takes place for trade (Broad *et al.*, 2003; Butchart *et al.*, 2010). Although most trade occurs at the local and national level, large volumes of international trade also takes place annually, which can diminish wildlife populations, cause species extirpations, and ultimately threaten ecosystem function (Roe *et al.*, 2002; Nijman, 2010; Smith *et al.*, 2010; Duckworth *et al.*, 2012).

International business on wildlife and its products are a serious threats to ecology (Daniel *et al.*, 2015). Global ecology is being degraded due to massive quantity of wildlife trade for different trophies in Southern Africa (Daniel *et al.*, 2015).

Alarming situation rises in illegal wildlife trade (IWT) show that tough law enforcement is not enough to stop poachers devastating populations of iconic or endangered species (Abensperg-Traun, 2009). Local people must be empowered to benefit from conservation and be supported to partner with law enforcement agencies in the fight against wildlife crime (Biggs *et al.*, 2015). Sustainable use of wild species and incentive-driven conservation in developing countries was introduced where peoples' participation of reducing wildlife business was emphasized on southern Africa (Abensperg-Traun, 2009).

In Cambodia, large scale business was going on five species of water snake (Stuart *et al.*, 2000). These snakes were harvested and traded from the largest freshwater lake in South-east Asia named Tonle Sap Lake (Stuart *et al.*, 2000). These species have been facing high catching pressure by the traders (Stuart *et al.*, 2000).

Different species of indigenous and migratory birds and small carnivore mammals were hunted by the tribal and ethnic groups in Chittagong Hill Tract areas (CHT) (Chakma, 2007). Bandarban, Rangamati and Khagrachari districts occupied CHT (Chakma, 2007). About 90% of the total tribal groups in Bangladesh have been living in these area. These people are completing the demand of their animal protein by hunting wild animals using locally made trapping tools (Chakma, 2007).

The felling of trees for timber and fuel and encroachment on forest areas has reduced the total reserve forest area by 50% in the last 20 years (MoEF, 1995). On the whole, Ministry of Environment and Forests of Bangladesh (MoEF) recorded the environmental picture in Bangladesh appears particularly with an unprecedented rate of forest loss, poaching of wildlife, destruction and pollution of water bodies, degradation of coastal areas, periodic devastating floods and an apathetic administrative system (MoEF, 1995).

It is revealed that wildlife business is randomly going on different countries in the world as well as in Bangladesh. But in Bangladesh, there is not much published information are available on wildlife business except Drews (2002), Das (1990) and WILDLIFE CONSERVATION SOCIETY (2018). Therefore, the study on the business of wildlife species in Bangladesh is veritable fact to decide for study in present context.

Considering the amphibian species in the world, information reveal that the business on amphibians are going on *Hoplobatrachus tigerinus* and *Euphlyctis hexadactylus* (Niekisch, 1986).

In respect of reptiles many information are available on which the business is going on (Das, 1990; Oliver, 1979; Stuart *et al.*, 2000; Duc and Broad, 1995; Hossain *et al.*, 2013).

The wildlife trade is a very profitable business as people buy the animals to keep as pets. Businessmen try to collect rare species for their customers. They get the animals from breeding centres, trappers, poachers and by many other methods (Sarker and Abdullah, 2010).

A significant number of birds have been selling in Dhaka and in Chittagong for several years (Sarker and Abdullah, 2009a). The business on birds have been occurring at the different corners of the world (Srikosamatara, *et al.*, 1992; Alacs and Georges, 2008).

The business on large mammals, big cats and other mammals enrich the volume of wildlife trade in the world every year. There are many published information found on the trade of mammalian species. For instance, Biggs *et al.* (2013) reported the trade of African Rhino horn in Tanzania, Underwood *et al.* (2013) talked about business on elephant ivory in Namibia, Alacs and Georges (2008) published on the business going on mammals in Australia, Weaver *et al.* (2011) observed the bush meat trade in Malawi, Srikosamatara *et al.* (1992) reported the trade of different mammalian species in Thailand and Bhiksu *et al.* (2002) found the trade on live bear and bear parts in Indonesia.

The business of wildlife and wildlife related products is a burning issue all over the world. This business is a serious threats for large number of species in the world as well as for those in Bangladesh. As the study on this subject was not significant in our country, so emphasis was given on wildlife business and its impacts on nature and conservation issues.

1.2 General aims of the research work

The general aim of the study was to reduce the frequency of Wildlife Business in Bangladesh and make people aware of the importance of Wildlife.

1.3 The major objectives of this research work were to:

- a) detect the business spots and people involved;
- b) identify the species dealt with and their sources of collection;
- c) divulge the channel of their national and international link of illegal business;
- d) assess the extent of exploitation and impact on nature; and
- e) apply necessary steps for conservation.

CHAPTER 2: MATERIALS AND METHODS

2.1 Materials

According to Wildlife (Conservation and Security) Act, 2012, “Wild animals means different types and species of animals or different stages of their life cycle, the source of which is considered as wild”. In this study amphibians, reptiles, birds and mammals were considered as wildlife. These animals have great demand in the market.

2.1.1 Study area

The present study area was spread all over Bangladesh where wildlife trades are going on were pinpointed (Map 1, Chapter 3).

2.1.2 Study period

The study was carried out from January 2011 to June 2016. Data on wildlife trade was collected from the field during 2011 to 2014 and conservation activities were done from 2012 to 2016.

2.1.3 Materials used

The following materials were used during the field study:

Books and journals: Different books and published papers are used for study and for referencing.

Camera: A digital Camera (Sony, model: DSC-S750, 7.2 megapixel, 3x optical zoom) and iPhone 6 were used to take photograph from different spots and some seized wildlife.

Laptop: An HP Laptop (model 15-db0187au AMD) was used to store and process all data.

Datasheet: A well-prepared datasheet was used during field data collection (Appendix 1).

Paper, pen and pencil: Paper, pen and pencil were used during field study to note the data.

Exchange rate of money: The average exchange rate of USD to BDT from 2011 to 2016 was 76.32.

2.2 Methods

2.2.1 Detection of wildlife spots

Based on my previous experience (Sarker and Abdullah 2009 a, b), the wildlife business spots in Dhaka city were known. The people involved in wildlife business in Kataban Market of Dhaka University were interviewed and came to know few other spots in Dhaka Division. Visited those informed areas (bazars/markets) and interviewed the persons involved there in wildlife business got more information. Like that way got a picture of the spots of selling wildlife in Bangladesh, in addition, law and enforcement agencies of Bangladesh and Wildlife Crime Control Unit (WCCU) of Forest Department seized some illegal wildlife specimens helped me to know more.

2.2.2 Sources of wildlife collection

Lives wildlife are collected from the wildlife trappers in different parts of the country. There are some professional wildlife trappers and they have good connection with the wildlife dealers and/or shop keepers. The continuous demand of wildlife in the markets influence the trappers to capture wildlife and they do it silently.

2.2.3 Wildlife business links

It is very difficult to trace the wildlife illegal trade links either national and/or international. This is because of the shop keepers/wildlife business persons avoid to provide the link(s).

2.2.4 Assessed wildlife exploitation and its impacts in nature

Data were collected from both primary and secondary sources. Data were collected from the organized markets (Table 1) through the direct observations. Besides, more data were collected from the following sources:

- ☛ Street animal sellers,
- ☛ Local selling of wild animal as food item by tribal and ethnic groups,
- ☛ So called traditional medicine sellers, and

🔍 Online based sellers

An average price of the wildlife was estimated (calculated) on the basis of asking price by the dealers.

2.3 Identification of wildlife species

The identification of species was done after Ali (2003), Bologna (1987), IUCN Bangladesh (2015b, c, d), Khan (2018), Shrestha (1997) and Whitfield (1998).

2.4 Data preparation

Microsoft excel used to calculate the data

2.5 Data analysis

Two proportionate z-test was done by the following equations to find out the relations between the impact of wildlife business on nature and initiatives taken for conservation issues.

The overall sample proportion magnitude was considered for the animals of each group is $\hat{p}$.

This implies that the test statistics for testing is:

$$H_0 = \hat{p}_1 = \hat{p}_2$$

$$\text{Versus, } H_1 = \hat{p}_1 \neq \hat{p}_2$$

Where,

z = Test hypothesis

$\hat{p}$ = Population proportion

H_0 = Null hypothesis

H_1 = Alternative hypothesis

$\hat{p}_1$ = First population proportion

$\hat{p}_2$ = Second population proportion

If, the value of $z \geq 1.96$ at the 5% level of confidence, hence H_0 can be clearly rejected. Then there will be sufficient evidence at the 0.05 level to conclude that the selling of animals of any group within a year from 2011 to 2014 have some significant changes due to take proper initiatives for conservation.

Since, $z \leq 1.96$ at the 5% level of confidence, hence H_0 can be clearly accepted. Then there will be sufficient evidence at the 0.05 level to conclude that the selling

of animals of any group within a year from 2011 to 2014 have no significant changes after taking proper initiatives for conservation.

2.6 Conservation issues

- Conservation activities was done among snake charmers, students, teachers, members of law enforcing agencies.
- Both reactive and proactive ways were followed.
- Legal operations were carried out with the help of law enforcing agencies where trading of wild animals occurred.
- Rehabilitations for snake charmers were done by creating alternative income sources for them.

2.6.1 Reactive way

Law enforcing agencies such as Bangladesh Forest Department (BFD), Bangladesh Police and Rapid Action Battalion (RAB) etc. conducted different operations from 2012 to 2016 against wildlife business on the basis of information and participations by the author and different levels of people in several times (Plate 1). Besides, regular drive and recovery occurred frequently by Bangladesh Police in different district on the basis of intelligences (Plates 2 & 3).

2.6.2 Proactive way

There are many traders who have been dealing with this business by generation after generation and live on only this profession. These communities cannot be controlled only by enforcing law. They need community engagement or rehabilitations. There are other groups of people who take wild animals only for hobby. These people have no negative intention to keep them as pet rather most of them do not know that keeping wildlife is illegal. On the basis of these two perspectives, the proactive way of controlling measures have been conducted by the following two ways:

- ☛ Rehabilitation for the dealer
- ☛ Raising awareness among the generations

2.6.2.1 Rehabilitated dealers at Bakterpur village, Savar

For rehabilitation program, the snake charmers were chosen who lived in Bakterpur village under Savar Upazila in Dhaka District. Snake Charmers have been living on dealing with snakes by generation. They did not know that catching snake from nature and dealing with them is an offence rather this was their prime occupation. These communities cannot be controlled only by enforcing law. They need community engagement or rehabilitations so that they can leave snake dealing and can lead their life properly in the society.

2.6.2.2 Awareness was raising

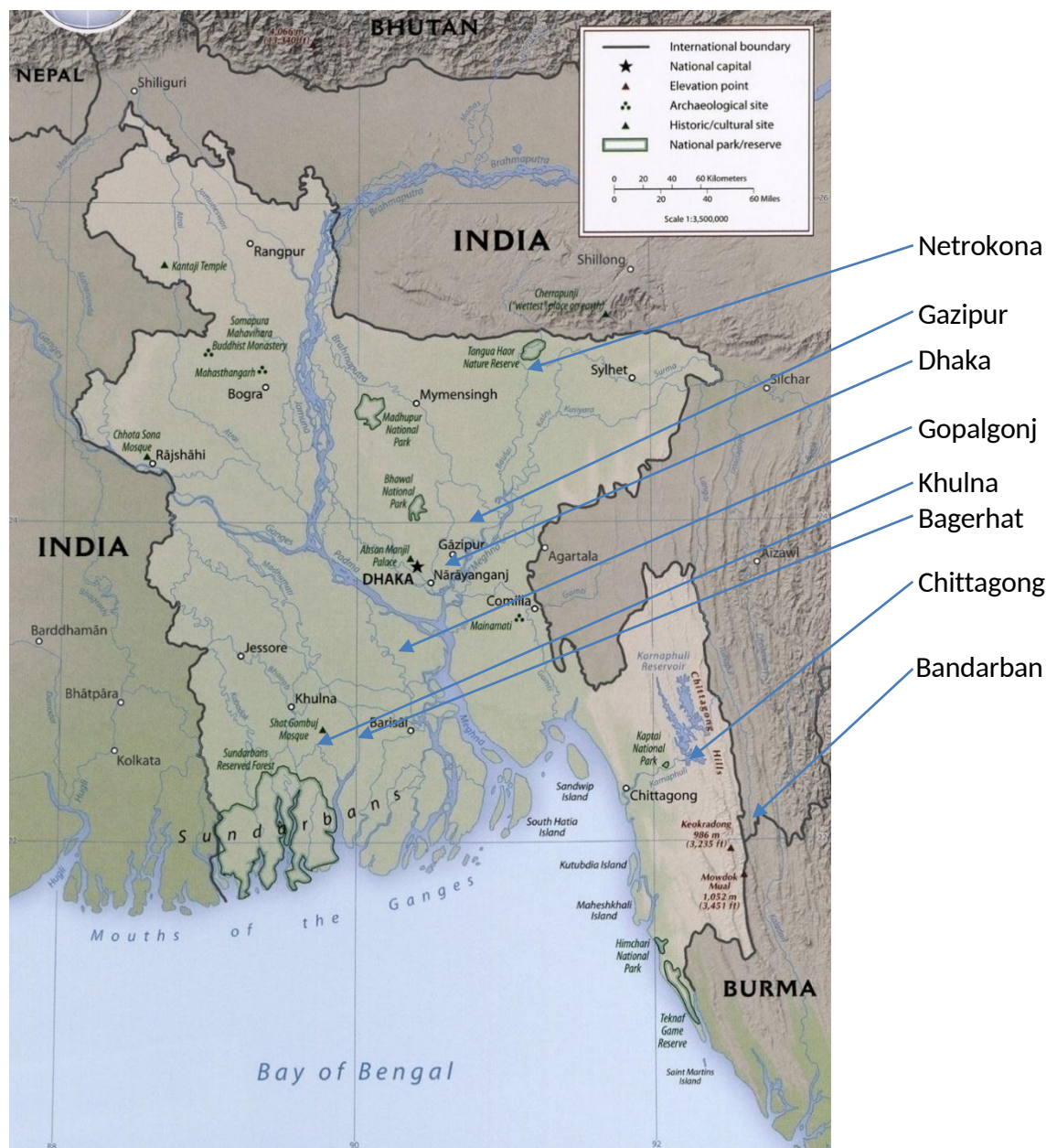
To raise awareness, students who read in class eight were chosen. Students of this age are taken in consideration to play role in building the conception so that a generation can be built up who will be conscious about wildlife and wildlife related business.

Awareness program was also conducted among Police, RAB and other law enforcing agencies from 2013 to 2016. They were informed about the existence, role and importance of wildlife in our nature and also about the business. They were also taught the significance of handling cases related to wildlife crime.

CHAPTER 3: RESULTS AND DISCUSSION

3.1 Wildlife business spots in Bangladesh and people involved

Both organized and unorganized wildlife trade markets were found as wildlife business spots in Bangladesh (Map 1) 2011 to 2016. Twelve markets were organized (Table 1) and their very brief illustrations of the locations have been described.



Map 1: Location of recognized (major) wildlife business spots in Bangladesh

3.1.1 Dhaka University market, Kataban

Dhaka University market is situated under Ramna Thana (23° 44' 16.53" N; 90° 23' 27.40" E) (Plate 4). It is located at the north of Nilkhet market. The animal business at the market was started with two shops in 1990 which has expanded into 21 shops.

3.1.2 Kaptan Bazar, Dhaka

Kaptan Bazar (23° 43' 18.11" N; 90° 24' 47.06" E) is one of the large retail markets of daily essential commodities in Dhaka south city corporation. It is situated under Sutrapur Thana (Plate 5). Banga Bhaban (president's residence) is situated next to the market. Nine shops deal with animal business in the market.

3.1.3 Shakhari Bazar, Dhaka

Shakhari Bazar (23° 42' 30.28" N; 90° 24' 30.40" E) is a busy area at old Dhaka city (Plate 6). The area is situated under Kotowali Thana. CMM court, DC office and district board office are situated just near to this area. Four groups of people were engaged with Turtle business for 25 years. They collected turtles from the Shitalakkhya, Meghna and other associated rivers. Turtle selling was their main source of income. The Hindus are the main customers of these animals as they eat turtle meat.

3.1.4 Bakterpur (Snake charmers' village), Savar, Dhaka

Bakterpur village is situated under Savar Thana in Dhaka District (23° 51' 01.30" N; 90° 15' 00.62" E). The village is situated about 16 km south from Dhaka Metropolitan area (Plate 7). The Snake Charmers have been living in this village for over hundred years and continuing their traditional business. The Snake charmers collect snakes from different area of Bangladesh. They also collect snakes from India through Kholahati border of Rangpur District. The other snake charmers of all over the country are the customers.

3.1.5 Tongi Bazar, Gazipur

Tongi is a township in Gazipur District of Bangladesh. It is located immediately north of Dhaka (Plate 8). It lies within the jurisdiction Gazipur District, which is a

part of the Dhaka Division. Tongi is surrounded by the River Turag. Different species of Birds and Mammals were found to be sold at Tongi Bazar ($23^{\circ} 53' 24''$ N to $90^{\circ} 24' 21''$ E).

3.1.6 Reazuddin Bazar, Chattogram

Reazuddin Bazar is one of the busiest areas in Chittagong ($22^{\circ} 20' 11.51''$ N; $91^{\circ} 49' 56.04''$ E). The market is situated beside the Railway station of the city (Plate 9). The animal business has been running here for a long time. There are 15 such shops present in this market.

3.1.7 Bandarban Sadar Bazar, Bandarban

Bandarban is a District in south-eastern area of Bangladesh. It is situated in Chittagong Division (Plate 10). It is one of the three hilly districts of Bangladesh and a part of Chittagong Hill-Tracts. This district is the lure of the tallest peaks of the country. The biggest market is situated in the centre point of the city under Sadar Upazila ($22^{\circ} 14' 17.02''$ N; $92^{\circ} 11' 25.06''$ E).

3.1.8 Upazila Bazar, Sadar Upazila, Gopalganj

Gopalganj is a District under Dhaka Division of Bangladesh. It stands on the bank of the Madhumati River (Plate 11). The district is bounded by Faridpur District on the North, Pirojpur and Bagerhat district on the South, Madaripur and Barisal Districts on the East and Narail District on the West. Turtles are sold in this bazar ($23^{\circ} 1' 0''$ N; $89^{\circ} 50' 0''$ E).

3.1.9 Upazila Bazar, Kotalipara Upazila, Gopalganj

Kotalipara Upazila is situated adjacent to the Agoiljhara Upazila under Barisal District (Plate 12). Turtles were found to be sold regularly in the Upazila market ($22^{\circ} 59' 0''$ N; $89^{\circ} 59' 30''$ E).

3.1.10 Mohanganj Sadar Bazar, Netrokona

Mohanganj is an Upazila of Netrokona District under the Mymensingh Division of Bangladesh (Plate 13). It is one of the 10 Upazilas of Netrokona District. Mohanganj is largely known as the centre of Lower Bangladesh as it is the economic heart of Lower Bangladesh. The Upazila is bounded by Barhatta and Sunamganj Upazilas on the North, Khaliajuri and Sunamganj on the East,

Madan Upazila on the South and Atpara Upazila on the West. Turtles are sold near the Main Bazar of Upazila (24° 52' 0" N to 90° 58' 0" E).

3.1.11 Sundarbans in Dacope Upazila, Khulna

Dacope (22° 34' 18" N; 89° 30' 42" E) is an Upazila of Khulna District in the Division of Khulna. The Upazila is bounded by Batiaghata Upazila on the North, the Pashur River on the south, Rampal and Mongla Upazilas on the East and Paikgachha and Koyra Upazilas on the West (Plate 14). The main rivers are the Pasur, Sibsa, Manki, Bhadra. The southern part of this Upazila is surrounded by the Sundarbans.

3.1.12 Sadar Upazila, Bagerhat

Bagerhat Sadar (22° 39' 48" N; 89° 47' 30" E) is an Upazila of Bagerhat District under Khulna Division. Fakirhat, Chittalmari and Mollahat Upazilas on the North, Kachua Upazila on the East, Rampal Upazila on the South and West, and Morelganj Upazila on the East and South (Plate 15).

3.2 Locations of unorganized traders

A total of 40 spots were found during the study period where unorganized traders were dealing with wildlife business (Table 2).

3.3 Wildlife species dealt with and their sources of collection

Seventy-four species (57 indigenous and 17 exotic) were recorded to be sold at different markets in Bangladesh (Table 3), most of which were indigenous (77.03% species; 64.17% individuals) followed by exotic (22.97% species; 35.83% individuals) (Table 4). Sarker and Abdullah (2009b) also found the nearly similar proportions of species at Dhaka University market, Kataban during August 2006 to July 2007 (reptiles 4.33%, birds 80.67%, mammals 15% but no amphibians). Among indigenous and exotic species, birds were the highest sold species in the markets both according to species (45.61% indigenous, 76.47% exotic) and individuals (75.72% indigenous, 87.50% exotic) (Figure 1, Figure 2, Table 3, Appendices 2 and 3). Birds were the highly preferred traded animals in Australia (Alacs and Georges, 2008) and in Thailand also (Srikosamatara, *et al.*, 1992). Alacs and Georges (2008) recorded 06 amphibians, 21 reptiles, 79 birds and 34 mammals in the trading markets in Australia in 2007 and Srikosamatara,

et al. (1992) recorded 7 species of reptiles, 35 species of birds and 27 species of mammals during 1991 in Thailand.

From June 2012 to November 2016, the law enforcement agencies of Bangladesh (e.g., Bangladesh Police, Rapid Action Battalion), Wildlife Crime Control Unit (WCCU) of Bangladesh Forest Department (BFD) seized and rescued the highest number of reptiles (19,359) followed by birds (16,979) among the total of 37,039 wild animals (Farhin, 2017).

According to the Red List of Bangladesh (IUCN Bangladesh, 2015a), most of the traded species (68.45%) were under Least Concern category (Figure 3).

3.4 National and international channels of wildlife business

During this study, the following routes were known to be established for transporting wildlife business:

- 📍 Dhaka (Hajrat Shahjalal International Airport)
- 📍 Chittagong (Shah Amanat International Airport)
- 📍 Benapole border, Jessore with India
- 📍 Tamabil border, Sylhet with India
- 📍 Kholahati, Dinajpur with India
- 📍 Bhomra border area, Satkhira with India

In a drive, Bangladesh Police recovered two lion and two leopard cubs at Chansra intersection on the outskirts of Jessore town on 13 November 2017. Tipped off, a team from Chansra Police camp intercepted a car in the area around 10:00am and recovered the cubs from it, stated by Chansra police camp In-charge. The police team also arrested two people. The cubs that were taken from Dhaka Uttara and were being sent to India through Benapole border (The Daily Independent, 15 November 2017).

In 27 June 2011 BBC news broadcasted that Officials in Bangladesh said they had seized more than 120kg of dried turtles from smugglers near the north-western border with India (Hossain *et al.*, 2013).

Communication with Thai enforcement officials confirmed that cargo boats in Kolkata are used to transport tortoises to other Asian countries including Malaysia, Singapore and Thailand. International passengers also act as couriers taking flights direct from Bengaluru, Chennai, Kolkata and Mumbai (India) or indirect via Dhaka (Bangladesh) into Thailand's Suvarnabhumi International Airport. Alternatively, porous borders are utilized to transport tortoises into Bangladesh (e.g., Dhaka) for further air transport into Thailand. From here, tortoises are also transported on air travel to additional destinations within Southeast Asia including China (predominantly Hong Kong) (D'Cruze *et al.*, 2015).

Bangladesh remains as an important route of global wildlife smuggling because of rising global demands (Farhin, 2017). In December 2014, Border Guard Bangladesh (BGB) seized 220 wild turtles from Benapole border. In December 2015, Wildlife Crime Control Unit (WCCU) seized different species of animals and birds, including common myna, emerald dove, spotted dove, barn owl, red-breasted parakeet, mongoose, spectacled cobra, rat snake, Burmese python, ornate flying snake and copper-headed trinket snake from illegal traders at Tongi Bazar in Gazipur (Farhin, 2017).

According to Jessica (2010) it is impossible to know just how many illegal transactions are being made online, since the investigation only consisted of English language sites and focused mainly on five areas: live primates; elephant products; turtle and tortoise shell products; other reptile products; and wild cat products. International Fund for Animal Welfare (IFAW) found 5,527 elephant products on the internet including skin/leather products such as boots, wallets, purses, footwear and bags; bone products such as carvings, jewelry, a Mah-jong set and fans; and ivory products such as jewelry, boxes, chess sets, ornaments, and expensive sculptures. The fact that 146 live primates sold were on fifteen websites is horrifying; a transaction that is either entirely illegal or strictly restricted. 56,526 turtle and tortoise shell products were being sold on the internet, including websites such as eBay (Jessica, 2010). About 2,630 reptile products, including both live animals such as crocodiles and reptile clothing accessories, were being sold by fifteen internet traders. In 2005, IFAW also found

239 live wild cat specimens and wild cat products, such as claws and skulls, on the internet. The entire extent of wildlife trade on the internet must be staggering if this snapshot is any indicator (Jessica, 2010).

Elephants are revered in Thailand and, as an important part of the country's identity, they are an integral part of Thai beliefs and culture. However, despite this, Thailand has one of the world's largest unregulated ivory markets and is consistently highlighted as one of the most problematic countries in the illegal ivory trade (Doak, 2014). The illegal trade of ivory is increasing gradually in this area. The present rate of ivory trade forecasts the more vulnerable situation for this species within recent future (Underwood, *et al.*, 2013). According to Weaver *et al.* (2011), the loss of most large species in Malawi has resulted in bushmeat traders relying on the smaller species that thrive in human-modified landscapes, such as rodents, birds and insects.

The illegal trade on bearskins, gall bladders, canine teeth, skulls, claws, stuffed bear and 14 live bears while they were in an investigation during 2000 in Indonesia (Bhiksu *et al.*, 2002).

Only 37 incidents included an estimate of the monetary value of confiscated wildlife with a median of US\$12,500 (range = 8-466,250) and values greater than US\$100,000 reported for two incidents of gecko trading (number of individuals unknown); one of three live tiger cubs; one of 873 spotted pond turtles; one of 5,000 unidentified freshwater turtles; and one of 952 Indian star tortoises (Wildlife Conservation Society, 2018). Note that high-value incidents probably receive greater press attention and may not be representative of the 85.1% of incidents where a monetary value was not reported (Wildlife Conservation Society, 2018).

3.5 Impact on nature

As of January 2022, there is no recent data on the impact of wildlife business is observed. However, a general overview of the potential impact of wildlife-related businesses on nature based common challenges faced globally can be provided. Bangladesh, like many other countries, may face challenges related to illegal

wildlife trade. This involves the trafficking of animals and their derivatives, contributing to biodiversity loss and threatening endangered species.

Expansion of wildlife-related businesses, such as agriculture, logging, and infrastructure development, can lead to habitat destruction. This, in turn, poses a threat to the survival of various wildlife species, particularly those dependent on specific ecosystems.

This business is one of the major drivers of biodiversity loss, yet understanding the impacts of trade is constrained by the absence of monitoring of wild populations and the lack of knowledge of trade routes and dynamics, and volumes of species in trade (IPBES, 2019).

The impact of wildlife crime on the ecosystem has been valued at a staggering \$1 to \$2 trillion annually by a World Bank report (World Bank, 2019).

Certain wildlife businesses inadvertently contribute to the decline of endangered species through habitat destruction, pollution, or disturbance. This can have cascading effects on ecosystems and biodiversity.

To account for the high loss of individuals, poachers and traders often capture large numbers, drastically increasing poaching pressure on many species (Van Uhm, 2016). Even if animals survive the poaching and transport, mortality rates often remain very high (Toland *et al.*, 2012). Poaching pressure can cause species to lose iconic phenotypic traits. For example, poaching has increased the ratio of tuskless female elephants (*Loxodonta africana*) in Africa (Campbell-Staton *et al.*, 2021). The IUCN red list shows that at least 5209 animal species are near threatened or threatened due to “use and trade” (IUCN, 2022). Overexploitation can directly lead to loss of genetic diversity, population declines and extinctions of species (Hedrick and Kalinowski, 2000). A recent study estimated that 18 % of vertebrate species are at risk of extinction from trade (Scheffers *et al.*, 2019).

The environmental consequences of International Trade of Wildlife (ITW) go beyond the impacts on the target species. Many illegal harvest methods,

particularly in the marine environment, have limited or no selectivity and result in substantial incidental mortality of non-target species. The loss of populations of species as a result of ITW may have butterfly effects across the ecosystem resulting in a deterioration of ecosystem functions and services of national, regional and global importance.

There are cases where declines in particular populations, and in some cases entire species, can be attributed primarily to illegal trade. Examples include many charismatic, high-profile mammals, such as African Elephant (VU), Rhinoceroses, and Tiger (EN). There are also examples of lesser-known species that have been severely affected by illegal trade. For example, Spix's Macaw (CR) is thought likely to be extinct in the wild in Brazil, primarily as a result of illegal trapping for trade (BirdLife International, 2013a). In Madagascar, illegal collection of Critically Endangered Ploughshare Tortoise (CR) for the international pet trade represents a significant threat to the persistence of this species in the wild.

Luristan Newt (CR), a species with approximately 1,000 adults remaining in the wild (Sharifi *et al.*, 2009), is also threatened by illegal take for the pet trade (Baillie and Butcher, 2012).

Incidental snaring also poses a major threat to Critically Endangered Edward's pheasant in Viet Nam, including within protected reserves (Brickle *et al.*, 2008; Birdlife International, 2014). Local Southeast Asian hunters applying non-selective traps such as (terrestrial) drift nets ensnare a wide range of non-target species (Newton *et al.*, 2008). Since the 1960s, 12 animal species have become extinct, or virtually extinct in Viet Nam due to unsustainable hunting practices (Wilkie *et al.*, 2011).

Pangolin species are subject to very high levels of illegal trade and declining population sizes (Challender *et al.*, 2014). Pangolins have been exploited most heavily in Asia and in particular in China, where estimates suggest up to 160,000 animals were harvested from the wild annually between the 1960s and 1980s (Yue, 2008). Overexploitation led to commercial extinction of pangolins in the mid-1990s in China and the country has since been dependent on imports from other pangolin range states (Challender *et al.*, 2015). All species of Asian

pangolin have been listed in CITES Appendix II since 1975 and up to the year 2000, some legal international trade was reported (Challender *et al.*, 2015). However, large volumes of illegal trade also took place in the period 1975-2000, and in recognition of the unsustainable nature of this trade (WCMC *et al.*, 1999). Despite these measures, illegal harvest and international trade in Asian Pangolins continues (Challender *et al.*, 2015). It is estimated that up to 227,000 pangolins have been seized in Asia since 2000 (Challender *et al.*, 2015), although the actual number of animals in trade since then has been estimated at over 1,000,000 (Challender *et al.*, 2014). Recent assessments for the IUCN Red List resulted in the Chinese and Sunda Pangolins being listed as Critically Endangered and the Indian and Philippine Pangolins being listed as Endangered, based on population declines due to levels of exploitation (Baillie *et al.*, 2014; Challender *et al.*, 2014).

Seizures of illegal elephant ivory more than doubled between 2007 and 2011 (Underwood *et al.*, 2013). Between 2010 and 2012, illegal killing exceeded the intrinsic growth capacity of many African elephant populations (Witemyer *et al.*, 2014).

Vultures are widely hunted and traded in Africa for use in traditional medicine (Saidu and Buij 2013, Williams *et al.* 2014, Amezian and El Khamlichi 2015). African vultures are increasingly threatened by ITW, both as a target species and as a victim of the illegal harvest and trade in rhino and elephant. The result, exacerbated by other causes of mortality (Ogada *et al.*, 2015), is a significant ongoing decline in vulture populations across Africa, with seven of Africa's eleven vulture species now listed as Critically Endangered or Endangered (BirdLife International, 2015). The environmental impacts of these declines in Africa are already becoming apparent, and additional future impacts can be predicted from the documented declines that have taken place in South Asia.

Wildlife Depending on the country and taxa, between 9 % and 77 % of the "legal" wildlife trade is assumed to be of illegal nature (Karesh *et al.*, 2007; Oyanedel *et al.*, 2022; Tittensor *et al.*, 2020). Overexploitation of natural resources, which includes ITW, is estimated to beat even climate change in its negative effects on

biodiversity. ITW can directly affect species but also have far-reaching consequences for animal, plant, or fungi species and humans (Maxwell *et al.*, 2016).

ITW bears the risk of introducing invasive species into environments. A conservative estimate appraises that invasive species generate costs of around 160 billion USD annually (Diagne *et al.*, 2021).

A well-studied example is the introduction of the Burmese Python (*Python bivittatus*) to the southern United States (e.g. the Everglades National Park), which has been implicated in the decline of several native and endangered species (Dorcas *et al.*, 2012). It is suspected that the Burmese python was either introduced through the illegal or legal pet trade or via accidental release from captive breeding facilities during Hurricane Andrew in 1992 (Snow *et al.*, 2007). Another study estimated that 17.9 % of illegally traded reptile species in Australia are likely to become established invasive species if they escape (García-Díaz *et al.*, 2017), demonstrating the potential risks of ITW for the emergence of invasive species.

Other environmental impacts of ITW include the spread of diseases. Transport of wildlife within or between countries provides a pathway for transmission of pathogens that are a threat beyond the target species to biodiversity, agricultural production and human health (Smith *et al.*, 2009). The risk of disease transmission from illegally traded wildlife is highlighted by the wide range of pathogens documented from confiscated animals (Gómez and Aguirre, 2008). For example, seized Mountain Hawk-Eagle which had been smuggled from Thailand to Belgium were diagnosed with a highly pathogenic avian influenza A/H5N1 virus, a disease that poses a threat to wild and domestic birds and to humans (Van Borm *et al.*, 2005). International trade in amphibians, though primarily legal, has been implicated in the spread of chytridiomycosis, a disease responsible for amphibian population declines in several continents (Weldon *et al.*, 2004; Kilpatrick *et al.*, 2010).

Mitigating the impacts of wildlife businesses on habitat destruction requires sustainable practices, conservation planning, and the integration of biodiversity

considerations into economic activities. Strategies include the implementation of responsible land-use planning, the promotion of sustainable agricultural and forestry practices, and the establishment of protected areas. Collaboration between businesses, governments, conservation organizations, and local communities is essential to finding a balance between economic development and the conservation of biodiversity (Diagne *et al.*, 2021).

To address these issues, sustainable logging practices that consider the long-term health of ecosystems are essential. This includes selective logging, reforestation efforts, and adherence to certified sustainable forestry standards. Proper forest management can help balance the economic benefits of logging with the need to preserve biodiversity and ecosystem functions. Additionally, regulatory frameworks and conservation initiatives are crucial for ensuring the responsible management of forest resources.

3.6 Conservation steps taken for reducing wildlife business

Conservation works is necessary to reduce wildlife business that could lead an impact on nature at a certain level. The controlling measures for conservation have been done by-

- reactive way
- proactive way

3.6.1. Reactive way

Law enforcing agencies such as Bangladesh Forest Department (BFD), Bangladesh Police, Rapid Action Battalion (RAB), etc. performed different operations from 2012 to 2016 against wildlife business on the basis of information and participations by the author and different levels of people in several times (Plate 1). Besides, regular drive and recovery occurred frequently by district police on the basis of intelligences (Plates 2 & 3). A total of 31,752 wildlife specimens were rescued, of which most of them were reptiles (60.70%) followed by birds and mammals (Table 5).

3.6.2 Proactive way

There are many traders who have been dealing with wildlife business by generation after generation and live on only this profession. So, these communities cannot be controlled only by enforcing law. They need community engagement or rehabilitations. There are other groups of people who take wild animals only for hobby. These people have no negative intention to keep them as pet rather most of them do not know that keeping wildlife is illegal. So, on the basis of these two perspectives, the proactive way of controlling measures has been conducted by the following two ways:

- 🦋 Rehabilitation for the dealers; and
- 🦋 Raising awareness among the generations.

3.6.2.1 Rehabilitated dealers at Bakterpur village, Savar

Seventy women and 32 men snake charmers have been trained (Driving and Industrial sewing) in 2014 and 2015 (Plates 16, 17 & 18). Till then, they have been away of snake dealing and they will not return to their original professions. Each of them sold 2.6 snakes averagely in a month. The cost of 2.6 snakes were 1,300 Taka approximately (76.32 Taka = 1 US\$). From January 2016, 70 women snake charmers have been working in a garment factory which was raised in their own society (Plates 19, 20 & 21). From December 2017, they have been earning 12,00,000 taka per month for their factory. From February 2017, 32 men snake charmers are now professional driver and earn around 400,000 Taka per month collectively.

Peoples" engagement was synchronized in conservation activities. Snake charmers in Savar area they have not only left their business of snake, but also, they have set up a small garment factory named „Uttaran" where they went for industrial production of fabrics (Plates 20, 21 & 22). Different big garment industries have provided work order to them. This was happened by the direct involvement of Dhaka district police led by the then Police Super Mr. Habibur Rahman (Plate 16). He took the initiative to rehabilitate them (Plates 17 & 18). In this factory, snake charmers only from their society work and they have given up their business got from their ancestors (Plate 19). This engagement of the people

who deal with wildlife business is a kind of initiative under Community-based Wildlife Management (CWM) system. It is a process of Wildlife and habitat conservation where communities have a key or significant role in the decision-making process. This role could range from a consultative role for communities over management functions, decision making and conservation responsibilities. This system can be termed as Community-based Conservation (CBC) also.

3.6.2.2 Awareness raised among the young generation and law enforcing agencies

Awareness was raised among 120 school going students who read in class eight of Shahid Police Smrity college, Mirpur Dhaka in 2015. Students of this age were taken in consideration to play role in building the conception so that a generation can be built up who will be conscious about wildlife and wildlife related business. Among the 120 students, 67 kept turtles and different native birds as pet (Plate 23). In June 2016, 51 students left this hobby.

Regarding buyers, students and teachers from different schools and colleges were enlightened against dealing wildlife as pet or hobby (Plate 24). These people did not know that keeping birds as hobby is a punishable offence. Keeping birds as hobby is not mentioned as a forbidden activity even in our culture and literature. A child from its early hood came to know from different Bangla Rhymes that keeping Myna (Hill Myna) and Parrot (Parakeets) are good as hobby. From the campaign, they came to know that dealing with wildlife is a serious offence according to the law. Now, they do not keep wildlife as pet or hobby (Plate 25). This awareness program was also conducted among some members of Police, RAB and other law enforcing agencies from 2013 to 2016. They have been trained about the importance of wildlife and legal steps on wildlife crime (Plate 26).

At the Eastern Himalaya Organized criminal networks operate across the Eastern Himalayas, aided by corruption, poverty and weak laws (Miceler, 2010). Bengal tigers and greater one-horned rhinos are the prime targets in trade operations (Miceler, 2010). When a tiger is killed, a separate group culls the skin, packs the meat, and stores the bones and claws all at the site of the killing (Miceler, 2010).

Locals who know the border areas are paid to transport the illegal wildlife products. After the illegal wildlife reaches the country of demand, the product is sold to the highest bidder (Miceler, 2010). Money from the transaction is laundered, often within federal tax and revenue agencies, before beginning the next cycle of supply and demand (Miceler, 2010).

3.7 Cost of sold animals

A total of 1,34,96,13,605 BDT (One hundred thirty-four crore ninety-six lac thirteen thousand six hundred five taka only) (1,76,83,616.42 USD) was transacted against indigenous animal trade. Most of which were from birds (41.23%) followed by mammals (40.15%), reptiles (18.33%) and amphibians (0.29%) (Appendix 10). During the study period, whole body (99.29%) and trophy (0.71%) were recorded.

Poaching of endangered species to feed the illicit global trade of wildlife estimated to be worth between \$8 and \$10 billion per year excluding fisheries and timber is rising at an alarming rate (Biggs *et al.*, 2013). Activity in the illegal ivory trade has more than doubled since 2007 and is over three times larger than it was during the last peak in 1998, with the street value of ivory capable of reaching up to \$2,205 per kilogram in Beijing (Lawson and Vines, 2014). Rhino horn can sell for \$66,139 per kilogram more than the price of gold or platinum on the Chinese black market (Lawson and Vines, 2014). INTERPOL estimates that illegal wildlife trade globally accounts for some \$10-20 billion annually (Farhin, 2017). The trade of Africa's Rhino horns worth about 1.5 million US dollar in 2011-12. Organized criminals and poachers are active in Tanzania (Biggs *et al.*, 2013) also.

3.8 Trade of individuals according to class of wildlife

The recorded animals are belonging to different groups (Figure 1) which are discussed below:

3.8.1 Amphibians

Two species of amphibians {Bull frog (*Hoplobatrachus tigerinus*) and toad (*Duttaphrynus melanostictus*)} were recorded to be sold in the market during

study period, most individuals of which were Bull frogs (84.29%) (Appendix 3a). Legs of Bull frog were the highest preferable parts to consume (Plate 27).

In Bangladesh, demand of frogs and frog legs was increased during 1989 (Drews, 2002). Export of frog legs consisted of only cost \$15.95 (US dollars on average) to satisfy the gastronomic taste of many individuals around the globe (Drews, 2002). These legs came from a variety of places either from the wild or raised in special farms (Drews, 2002). Most of the wild frogs came from Bangladesh, India and Indonesia (Drews, 2002). As a result, disappearance of the frog race has occurred in a variety of places across the world such as in the United States, Australia, Bangladesh and Costa Rica (Drews, 2002). The importance of frog legs as a food item in France has apparently been linked to a marked decline in native frogs in Europe, India and Bangladesh (Drews, 2002). A contradiction lies between trade, environment and culture (Drews, 2002). In Bangladesh exporting frog legs by disseminating thousands of amphibians (nature's pesticides) to sustain a national economy, satisfy cultures with a growing affinity for exotic dishes while importing tones of artificial pesticides (Drews, 2002).

The International trade of Frogs' legs has increased substantially over the last 20 years (Drews, 2002). This is well illustrated by the customs export statistics of Bangladesh, India and Indonesia (Drews, 2002). Bangladesh, India and Indonesia exported 10,000,000 kg of frogs' legs in 1983, most of which were Indian Bullfrog (*Hoplobatrachus tigerinus*), Six-fingered frog (*Euphlyctis hexadactylus*), other Asian *Rana* species (Niekisch, 1986). The demand for frog legs in France is tremendous: the French eat 3,000 to 4,000 tones of them annually and approximately 20,000 frogs must be sacrificed in order to supply a single tone of legs (Drews, 2002).

3.8.2 Reptiles

Three groups of reptiles (5.92%) (Appendix 5) were recorded to be sold in market during the study period, most of which were turtles and tortoises (54.33%) (Plate 28) followed by snakes (43.64%) (Plates 29 & 30) and lizards (2.03%) (Appendix 3b, Plate 31).

Altogether, 15 species of reptiles (26.32%) were recorded of which the highest sold species was Spotted Flapshell Turtle (*Lissemys punctata*) was the highest (20.55%) sold species and Burmese Python (*Python bivittatus*) was the laest (0.07%) sold species (Appendix 3b; Plates 32-36). The Spotted Flapshell Turtle is demandable for its meat. The skin of Python is lucrative and highly valuable for the people who had hobby for it, but Python was not observed so frequently sold as it is risky to carry for transportation.

Snakes

Ten species of snakes out of 57 indigenous species were found (17.54%) (Figure 4) of which the highest was Rat Snake (*Ptyas mucosa*) (29.15%) and the lowest was Burmese Python (*Python bivittatus*) (0.16%) (Figure 4). The organized business of snakes found only at the snake charmers village in Savar of Dhaka. There were many charmers over the country who bought snakes from this village. Rat snake was very preferable species due to its attractive look, non-venomous character and it is easy to handle. People are convinced easily to play with it when snake charmers show game to them. The price of rat snake was BDT 700 which was affordable to charmers. As a result, the sale of rat snake was the highest among snakes (Plate 32). On the contrary, Indian python was found to be sold at the lowest due to its high price and difficult to collect, handle and carry from the forest to the expected area and had a chance to be exposed to the law enforcing agencies while checking on the road. Snake charmers throughout the country were the main buyer of them. Sometimes, they hunt Python when buyers order for it (Sarker and Abdullah, 2009a). Besides, ethnic and tribal people of Chittagong and Sylhet hilly areas have been regularly hunting this python for meat. They tanned the skin of Python and sale it to the buyer. Monocellate Cobra (*Naja kaouthia*), Binocellate Cobra (*Naja naja*), Common Sand Boa (*Eryx conicus*) and Ornate Flying Snake (*Chrysopelea ornata*) were also found during the study period. Red Sand Boa (*Eryx johnii*) was found to be sold in Savar market which were supposed to be imported from India. It is also known from them that they supply any species as per order of the customers and maintain high secrecy during dealing.

Gecko

An illegal trade of Geckos for their apparent medicinal value was duping investors and threatening the existence of this lizard species (The Daily Star, 2013). Different websites were offering sky high prices for this animal based on rumours (The Daily Star, 2013). This rumour led to a madly search for geckos (The Daily Star, 2013). Those who captured this animal from the wild got only taka 500 to 1000 for each. But this animal actually handed over around 6/7 tiers and the price reached a six-digit figure at the last tier (The Daily Star, 2013). For Bangladeshi sellers, the booking price was USD 46,000 which a website claimed (The Daily Star, 2013). The same website offered USD 11 million per gram for geckos weighing between 40 and 499 grams (of. Cit.) (The Daily Star, 2013).

Turtles

Four species of Turtles out of 57 indigenous species were found (7.02%) (Figure 5) during the study period. Within this group, the highest was Spotted Flapshell Turtle (*Lissemys punctata*) (37.83%) and the lowest was Peacock Soft-shelled Turtle (*Nilssonina hurum*) (12.71%) (Figure 5). Among the four species, shelled of Indian Roofed Turtle (*Pangshura tectum*) (Plate 37) and Yellow turtle (*Morenia petersi*) were taken for ornamental use. People use these two species in fish aquarium also. Spotted Flapshell Turtle and Peacock Soft-shelled Turtle are taken for meat consumption. Few groups of people in our country use to have these two species as food. As a result, high catching pressure on this species leading to be threatened in Bangladesh.

Turtles are caught from all over the Bangladesh and transported to Dhaka International Airport (Plate 38). Supply of turtles were peak during winter, while consignments left 6 days a week (Das, 1990). No foreign trade was seen in sea turtles from Bangladesh, although in coastal areas adult sea turtles are sometimes killed for subsistence and eggs were taken. At St. Martin's Island, the southernmost point of Bangladesh, local people sometimes trade sea-turtle meat with the Burmese for rice (Das, 1990). Oliver (1979) reported that the Elongated Tortoise (*Indotestudo elongata*) are collected for export from Bangladesh.

3.8.3 Birds

Around the country, overall 26 species of birds among 57 indigenous species (45.61%) were observed to be sold (75.74%) (Appendix 5) (Table 10) in the markets/spots of which 54.37% (Figure 7) (Appendix 3c) were non-passerines and 45.63% (Figure 2) (Appendix 3c) were passerines, and most of them (72.68%) were resident (Appendix 3c). The highest sold species was Black-headed Munia (*Lonchura malacca*) (22.51%) followed by Scaly-breasted Munia (*Lonchura punctulata*) (22.03%), and the lowest was Lesser Adjutant (*Leptoptilos javanicus*) (0.01%) (Appendix 3c, Figure 6, Plates 39-44). Eight species of passerine birds were observed to be sold of which, Black-headed Munia was the highest (17.05%) and Pied Myna was the lowest (0.08%) (Figure 7).

Among non-passerines, 18 species were recorded, the highest of which was Rose-ringed Parakeet (18.65%) and the lowest was Lesser Adjutant (0.02%) (Figure 2). During the study period, it is found that most of the people preferred to take indigenous bird as pet for enjoyment. Black-headed Munia and Scaly-breasted Munia were the highest choice. Besides, different species of parakeets, hill myna and dove were also in their choice. One migratory bird Lesser whistling duck was found to be sold in a street market at a remarkable frequency (10.10%) (Figure 2).

It is known from shopkeepers, in Dhaka University market, Kaptan Bazar and Reazuddin Bazar that all of the indigenous birds kept in their shops were captured directly from nature. Especially, Hill Myna (*Gracula religiosa*), which is found in Sylhet and Chittagong Hill Tracts is an endangered species (Azmiri, 2015). This species is very common in the market. Sarker and Abdullah (2009a) also recorded that most of the traded indigenous species are under threatened list in Bangladesh.

3.8.4 Mammals

Around the country, 14 species of Mammals observed to be sold in the markets/spots and most of them were Carnivores (Figure 8, Plates 46-51). The highest sold species was Five-striped Palm Squirrel (*Funambulus pennantii*) at

21.92% (Plate 46) followed by Rhesus Monkey (*Macaca mulatta*) (21.83%) (Plate 47), and the lowest was Bengal Tiger (*Panthera tigris*) (0.01%) (Figure 8). Seven species of Carnivore Mammals were found of which the highest was Common Palm Civet (*Paradoxurus hermaphroditus*) (35.78%) and the lowest was Bengal Tiger (0.02%) (Figure 9).

It is known from the interviews with dealers and traders, tribal and ethnic groups, traditional medicine sellers and poachers of Bangladesh hunt different species of mammals. People of tribal group largely hunt animals directly from wild for food. They took jungle cat (*Felis chaus*) (Plates 52 & 53), Small Indian Mongoose (*Herpestes auropunctatus*), Irrawaddi Squirrel (*Callosciurus pygerythrus*) and so on. People mostly preferred to take, Five-striped Palm Squirrel (*Funambulus pennantii*) for their hobby. Few people showed play with Rhesus monkey (*Macaca mulatta*) in the public place to entertain people. Poachers hunt Bengal tiger (*Panthera tigris*) and Spotted deer (*Axis axis*) for skin, meat, bones and claws.

Mammals were also recorded at a high frequency. Trophy of Bengal Tiger (*Panthera tigris*) was found in the market. Besides large number of Large Indian Civet (*Viverra zibetha*) and Jungle Cat (*Felis chaus*) are hunted by local hunters and ethnic people. Gangetic Dolphin (*Platanista gangetica*) was opportunistically caught in the fishing net in different sites throughout the country and sold it in the local market. Poachers also hunt this species to collect oil for traditional medicine production.

Besides organized wildlife markets, many street sellers were recorded in Dhaka and Chittagong Division. Very rare species such as skin of Pangolin (*Manis crassicaudata*) was found (Plate 54) in a street in Dhaka during the study period, which was critically endangered.

Poaching of deer is widespread in and around the Sundarbans (Plate 55). A large number of deer are being poached every year by professional poachers (Chakma, 2007); however, opportunistic hunters, fishermen, woodcutters and other resource collectors do this illegal practice as their secondary or leisure activity (Chakma, 2007). Prey depletion is a serious threat to any tiger population,

which has been occurring in the Bangladesh Sundarbans too (Ahmad *et al.*, 2009). Small carnivore and other mammals are trapped by poachers (Chakma, 2007). The indigenous people hunt wild animal especially for their food requirement (Chakma, 2007).

Vietnamese poachers often use snares to capture animals indiscriminately and illegally hunt Pangolins, Sun Bears and rare monkeys which are sold to Chinese buyers (Stuart *et al.*, 2000). In the remote mountains where the animals are found most male villagers over the age of 13 have firearms which range from old muzzleloaders to modern automatic weapons left behind from the Vietnam War (Stuart *et al.*, 2000). Much of the poaching done in Laos is done by Vietnamese hunters who catch animals such as Pangolins, Civets and Barking Deer for market in Vietnam and China (Stuart *et al.*, 2000).

3.9 Yearly variation of trade of animals

The selling number of wild animals varied year to year. During 2011 to 2014, the highest sale of amphibians and reptiles were recorded in 2012 but birds and mammals were in 2011 (Figure 10). In 2014, the business of wildlife reduced at a certain level than that of the 2011 due to taking conservation initiatives during 2012.

3.10 Status of Indigenous species

3.10.1 Status of Indigenous species according to IUCN Red List

Out of the sold animals, most (68.43%) of them were Least Concern (LC) (Figure 3). High catching pressure is still going on in case of animals of Critically Endnagered (CR), Endangered (EN) and Vulnerable (VU) catrgories. Bangladesh had rich animals diversity within the limited land area (Figure 3). But in past few decades, illegal business on wildlfie was spreaded over the country. As a result, the reduction rate of loss of animal diversity is speeding up day by day.

Thirty-one species of wildlife have become extinct from Bangladesh in the last hundred years (IUCN Bangladesh, 2015a). Among the sold wildlife in the markets, most of them are threatened. A Parakeet community has been found at the campus in the University of Dhaka. In the evening, they fly over the campus

and keep the environment charming. But the trappers follow them for trapping. After catching them, they sell them in different spots of the city. As a result, the population of parakeet is declining (Sarker and Abdullah, 2009a).

Among the threatened animals, most of them were birds (45.61%) followed by reptiles and mammals (Figure 11). No threatened amphibians were observed in the wildlife market throughout the country.

3.10.2 Status of Indigenous species according to CITES appendices

Under CITES Appendix category, very few animals are under Appendix I, II and III (Figure 12).

It was in this context of high levels of poaching and the increasing threat of cybercrime that International Fund for Animal Welfare (IFAW) investigated the trade in endangered wildlife taking place on 280 online marketplaces in 16 countries during a six week period in 2014 (Jo Hastie and McCrea-Steele, 2014). Investigators found a total of 33,006 endangered wildlife and wildlife parts and products from species listed on the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix I and II available for sale in 9,482 advertisements, estimated to be worth at least US \$10,708,137 (Jo Hastie and McCrea-Steele, 2014). of the advertisements, 54% were for live animals while 46% were for animal parts and products (Jo Hastie and McCrea-Steele, 2014).

3.11 Indigenous wildlife (Trophy or Whole body)

Body parts of the animals (Trophy) (Plates 56 & 57) and the whole body were recorded to be sold which varied according to groups of animals. The amount of sold trophy was 0.71% and the whole body was 99.29%. In case of sold trophies, trophies of mammals were observed at the highest rate (99.71%) among the groups during study period (Figure 13).

The Sundarbans in Bangladesh is known to support the world's largest contiguous population of the Bengal tigers (*Panthera tigris*) with the highest density in the world (Barlow, 2009). Studies show that this has been only possible due to having a healthy population of the prey species, mainly the spotted deer

(Dipu and Ahmed, 2013). In the Sundarbans" ecosystems, the tiger is the top predator and often termed the keystone species, umbrella species as well as the flagship species (Dipu and Ahmed, 2013). However, this supreme predator is under serious threats due to poaching and indiscriminate illegal killing for meat, skins, bones and other body parts (Plate 58). Although the Wildlife (Conservation and Security) Act, 2012 Bangladesh has made hunting for most of the wildlife species illegal, hunting or poaching in the Sundarbans remains a major threat to this Critically Endangered national animal. Tiger poaching in the Bangladesh Sundarbans, which had been unnoticed and purposively denied by the authority since long, has recently seen a boom and come to wider national and international attention (Dipu and Ahmed, 2013).

3.12 Purpose of business on wildlife

Business on wild animals occurred due to various reasons such as food, entertainment/living, hobby, poaching for medicine. Among the causes, „Hobby“ was the highest (75.25%) (Figure 14).

3.12.1 As food

Due to use as food, different animals were recorded to be sold, of which amphibians were the highest (50.12%) (Figure15).

A large number of turtles (four species) were sold in Farmgate and Shakhari Bazar (Plate 59), all of which were collected from different rivers in Bangladesh and all are threatened according to red list of Bangladesh (IUCN Bangladesh, 2015d). These species were also found to be sold at different local markets in Gopalganj and Netrokona Districts. Illegal poaching of these items led them threatened in Bangladesh. People of different communities are their customers as they consumed them. It is known from the wildlife dealers; they did not get enough turtles as they would get earlier which indicated that their populations are decreasing which is alarming for our country.

Small carnivore and other mammals were also trapped by different groups of indigenous people. The indigenous people hunt wild animals especially for their food requirement (Chakma, 2007) (Plate 60). They hunt Ducks, Geese, Egrets,

Hérons, Moorhens, Grebes, Cormorants, Jungle Fowls, Oriole, Hill Myna, Jungle Babbler, Munia, Parakeet, House Sparrow, Common Night Jar, Jungle Night Jar, etc. (Chakma, 2007).

Wildlife are traded in different provinces and cities of Cambodia in 1994, two species of amphibians, eight species of reptiles, 19 species of birds and 30 species of mammals were traded (Martin and Phipps, 1996).

People use varieties of wild animals as food in Cambodia (Martin and Phipps, 1996) and Hawkbill Turtles (*Eretmochelys imbricate*) have long been exploited in Vietnam for food, for the production of ornamental items crafted from their shells and for use in the preparation medicinal products. The goods that were made up of turtle's body parts had a huge demand in the markets. In Kien Giang Province, the total monetary value of the annual production of goods was 2000 US\$ (Duc and Broad, 1995). In NhaTrang District, four main retail stores in the city that sold stuffed Hawkills. Each store sold 200 to 300 specimens per year and the average retail price per specimen was 10,00,000 Dong (100 US\$) (Duc and Broad, 1995).

3.12.2 For entertainment

Animals have been traded for the entertainment at a rate of 5.91% (Figure 14) (Plate 61). Those were gathered from dealers and traders and/or local people bought wild animals and rear them for self-entertainment and for expressing high status (Plates 62 & 63).

3.12.3 As Hobby

Animals have been traded mostly as hobby at a rate of 75.25% (Figure 14). People do not know that keeping birds as hobby is a punishable offence.

Items in trade included 110 bear claws (US\$ 1.10-6.70), 47 canines (US\$ 2.20-11.10), around 10 other bear teeth, 4 bear paws (max. US\$ 11.10) and 37 bear gall bladders (US\$ 5.60-111.10). Some information indicated that Malayan Sun Bears were also illegally exported to other countries, such as Singapore, Korea and Malaysia (Bhiksu *et al.*, 2002).

3.12.4 For Poaching

Birds were recorded at the highest rate (83.03%) for poaching (Figure 16). Poaching of deer is widespread in and around the Sundarbans. Large number of deer are being poached every year by professional poachers; however, opportunistic hunters, fishermen, woodcutters and other resource collectors do this illegal practice as their secondary or leisure activity (Plate 64). Prey depletion is a serious threat to any tiger population, which has been occurring in the Bangladesh Sundarbans too (Ahmad et al., 2009). Tiger was one of the highly valuable poaching animal in Bangladesh. Tiger skins, skulls, bones and cubs are regularly hunted poached from Sundarbans (Dipu and Ahmed, 2013).

Wildlife crime has become a topic of international attention and concern over recent years. It is thought to be the fourth most lucrative transnational crime after the trafficking of drugs, people and arms (Haken, 2011). Sudden and rapid increase of Elephant and Rhino poaching in Africa to meet rising demand for ivory and Rhino horns (among other products) in China and Southeast Asia (Haken, 2011). Increasing level of organization and militarization of criminal activities, making the current spate of wildlife crime far more than a conservation issue, it also affects national security and local and national development. However, the term „wildlife crime“ covers a wide range of activities. At one end of the spectrum is the high profile of international trade of endangered species; while at the other are activities such as entering a protected area to collect firewood or medicinal plants (Haken, 2011).

3.12.5 As Medicine

For taking wildlife as medicine, mammals were recorded mostly (98.65%) (Figure 17). Trophy of Bengal Tiger (*Panthera tigris*), Large Indian Civet (*Viverra zibetha*), Jungle Cat (*Felis chaus*), Gangetic Dolphin (*Platanista gangetica*) are hunted by local hunter and ethnic people for medicinal purpose. Tiger parts have been integral elements of the traditional Asian medicine (Nowell and Ling, 2007).

Medicinal use of wildlife is also found globally. Forty-nine (75%) of 65 shops of Traditional Chinese Medicine (TCM) (33 in Canada and 32 in USA) sell manufactured bear bile medicines, six shops (9%) vended bear powder and capsules, and eight shops (12%) encashed 17 intact bear galls (Bhiksu et. al.,

2002). Fifty-one (78%) out of 65 traditional medicine (TM) shops were found to sell bear gall bladders or bile products in North America (Bhiksu *et al.*, 2002). In Indonesia, 14 live bears were found to be used as pets and traded in bird markets during 2000-2002 in association with-Bearskins, gall bladders, canine teeth, skulls, claws and personally owned stuffed bears (Bhiksu *et. al.*, 2002). Medicinal use of wild animals was also reported in different countries (Martin and Phipps, 1996). Wild animals were also used for decoration and export (Martin and Phipps, 1996).

Scientists apprehend that majority of the incidents remain undetected due to the covert and illegal nature of this activity (Nowell and Ling, 2007).

3.13 Economic Aspect

3.13.1 Sale of Indigenous wildlife

Among the sold indigenous animals, birds were bought by the consumers at the highest rate (41.23%) followed by mammals (40.15%) (Figure 18). As animals were bought by people mostly for hobby, they chose different wild birds. Birds are attractive for their aesthetic appearance, color and passerine characters. Birds are very easy to keep as pet. People and kids can be attracted very easily by the activities of bird in a cage. The animals were noted to be sold from 45 taka to 2,400,000 taka each (Appendix 3). Among them, most costly one was Bengal Tiger (*Panthera tigris*) parts, which was sold by BDT 2,400,000 (31,446.54 USD) each. On the other hand, the least costly species was Common Toad (*Duttaphrynus melanostictus*) which was priced 45 taka each. Among the indigenous birds, the most costly one was Hill Myna (*Gracula religiosa*), priced about 11,500 taka each. Prices of indigenous birds varied from 160 taka to 11,500 taka each.

3.13.2 Yearly variation of the sale of Indigenous wildlife

The sale of individuals was the highest (31.33%) in 2011 and was the lowest (19.38%) in 2014 (Figure 19). Among the groups, the highest sold group was Mammals (13.04%) 2011 and the lowest group was Amphibians (0.06%) in 2014 (Figure 19). Sale rates came down in 2014 due to taking proper initiatives against wildlife business.

3.13.3 Sale of Indigenous and Exotic animals

From 2011 to 2014, total sold indigenous animals were 64.17% and exotic animals were 35.83% (Table 3).

3.14 Number of traders

Animals were sold in both organized and unorganized ways. Between the two groups of traders, most of them were unorganized traders. They are living all over the country and are doing their business with wildlife independently but maintain a supply chain with organized business persons.

3.14.1 Organized traders

Organized traders are those who have a good set up and chain for their business. These dealers maintain permanent shops, employees and supply chain in their business line up (Plates 65 & 66). Among the persons involved in organized trade, most of them are employees (54.26%) (Figure 20). The real dealers remain behind the scene all the time. Organized dealers operate their business in open market by their employees. Most of the cases, the big dealers could not be identified as they do not come in front (Plates 67-69).

3.14.2 Unorganized traders

Unorganized traders are independent and individual in their field of profession. This category of dealers are street sellers, so called traditional medicine sellers, local trappers and poachers, etc. (Plates 70-73). Among the unorganized dealers, most of them are street sellers (75.31%) (Figure 21). Street sellers are in vulnerable condition in respect of their socio-economic conditions. They are unorganized but maintain a relationship with organized traders.

3.15 Financial condition of dealers

People who are involved in wildlife business could be classified according to their yearly income. They were divided into different categories like rich (BDT 60-80 lac per year- one lac equal to 100,000), medium rich (BDT 12.48 lac per year), medium (BDT 5-10 lac per year), low medium (BDT 2-4 lac per year) and low income (below BDT 2 lac per year). Among the dealers, most of them were under low income (40.78%) (Figure 22).

As this business is very profitable, a remarkable number of businessmen and dealers have a controlled grip over the markets. Most of them possessed higher status in the society but couldn't be identified conclusively as illegal wildlife dealers. In the field of criminology, this sort of criminals is termed as „White Collar Criminal“. This term indicates those people who have double face. They show their white face in light, but they are actually criminals behind the scene. In the market of wildlife business, dealers of different classes are moving by the instruction of these White Collar Criminals. These people have a strong portion of international illegal trade chain. They maintain the cross-border business. Bangladesh is being used as a route of poaching and transporting of wild animals.

Wildlife crime is considered as a low priority by the professional enforcement community. However, the high profit - low risk (of being detected, apprehended and convicted), nature of wildlife crime makes it attractive and the proceeds of wildlife crime may even be used to finance other forms of serious crime (Banks *et al.*, 2008). This alone should stimulate agencies that are concerned with socio-economic stability, security, law and order to be more engaged in stopping wildlife crime. Aside from the loss of the endangered species that are targeted for their body parts, the communities that live around them are also robbed of a potential source of income through wildlife tourism. Wildlife crime, therefore, undermines global efforts to alleviate poverty and achieve the Millennium Development Goals (Banks *et al.*, 2008).

In 2006-07, maximum sale was noticed in March and minimum sale was in December at Dhaka University market, Kataban. Each shop sold BDT 5500-5600 per day in an average (Sarker and Abdullah, 2009b).

The international illegal trade in Asian big cat skins (tiger, leopard and snow leopard) is largely driven by the markets of China, where skins are used for home decor, clothing, and prestigious gifts or non-financial bribes. Traders reported that visitors of China also purchase skins and smuggle them out in their luggage with some claiming to have used domestic and international post to transport skins beyond the primary trade hubs (Banks *et al.*, 2008).

According to traders, most of the tiger and leopard skins for sale across the Tibetan plateau and western China have been sourced from India and Nepal. This is corroborated by information from seizures in India and Nepal. Skins are trafficked across Himalayan borders in trucks, by pack animals and by individuals. Many of the trails used are ancient trade routes, some in well-known black-market areas along the Indo-Nepal border. Traders also report the complicity of government officials at border areas as well as at the retail end. One tiger skin trader in China stated that his sources in the local Forestry Bureau alert him in advance of any market inspections or raids (Banks *et al.*, 2008).

3.16 Significance test (two proportionate z-test)

An assessment was done to find out whether “the selling of Indigenous animals from 2011 to 2014 has any significance change due to take proper initiatives regarding conservation programs (Tables 6 to 10).

Selling of amphibians, birds and mammals was significantly changed (amphibians: $z = 13.84 \geq 1.96$, $\hat{p} = 0.07$; reptiles: $z = 5.72 \leq 1.96$, $\hat{p} = 0.06$; birds: $z = 22.74 \geq 1.96$, $\hat{p} = 0.7555$; mammals: $z = 15.33 \geq 1.96$, $\hat{p} = 0.12$) with different initiatives taken for conservation in all the studied year from 2012 to 2013 (Table 7).

Selling of amphibians, birds and mammals was significantly changed with different initiatives taken for conservation in all the studied years from 2013 to 2014 (Table 8).

In case of amphibians, since, $z = 6.53 \geq 1.96$, $\hat{p} = 0.0704$, the selling of amphibians from 2013 to 2014 have significant changes due to take different initiatives for conservation.

$z = 4.27 \leq 1.96$, $\hat{p} = 0.0587$, the selling of reptiles from 2013 to 2014 have no significant changes due to take different initiatives for conservation.

$z = 9.24 \geq 1.96$, $\hat{p} = 0.7460$, the selling of birds from 2013 to 2014 have significant changes due to take different initiatives for conservation.

$z = 4.07 \geq 1.96$, $\hat{p} = 0.1250$, the selling of mammals from 2013 to 2014 have strong significant changes due to take different initiatives for conservation.

The overall selling of amphibians, birds and mammals was significantly changed with different initiatives taken for conservation in all the studied year from 2011 to 2014 (Table 9).

In case of amphibians, since, $z = 25.39 \geq 1.96$, $\hat{p} = 0.0586$, the selling of amphibians from 2013 to 2014 have significant changes due to take different initiatives for conservation.

$z = 3.09 \leq 1.96$, $\hat{p} = 0.0561$, the selling of reptiles from 2011 to 2014 have no significant changes due to take different initiatives for conservation.

$z = 7.13 \geq 1.96$, $\hat{p} = 0.7565$, the selling of birds from 2011 to 2014 have significant changes due to take different initiatives for conservation.

$z = 10.80 \geq 1.96$, $\hat{p} = 0.1287$, the selling of mammals from 2011 to 2014 have strong significant changes due to take different initiatives for conservation.

It is mentionable that, in case of reptiles more markets were identified in 2012 and 2013 gradually. The conservation activities affect in one market, but data from new markets covered the recovered animals from the previous markets.

Among the exotic species, most of them can be bred in captivity, rest of them were imported, while the indigenous species were fully captured from nature. During the field study, it was observed that all of the indigenous species were captured from nature.

Large number of turtles were sold in Farmgate and Shakhari Bazar (Dhaka) regularly. All of these species are collected from different rivers and other aquatic bodies in Bangladesh. Four species were recorded which are threatened in Bangladesh (Appendix 3b). These species were also found to be sold at different local markets in Gopalganj and Netrokona Districts. There is no turtle farm in our country from where we can fulfill our demand in the markets. We have huge demand for turtles as people from several communities eat them as food. So, there was no other way but capture them from nature. As a result, their population is decreasing day by day. The traders also said that they are not getting enough turtles as they got in the past. This information is also indicating

about the decreasing of their population. Besides, habitat destruction, habitat loss and pollution might be the causes of decline. Non-passerine and migratory birds were found to be dealt in the business.

While capturing birds, hunters also destroy their habitats. Moreover, hunters do the same in case of non-targeted wild animals. They also cut and destroyed different plants which results the imbalance of nature. Besides, people introduced invasive alien species of plants rather indigenous plants. As a result, birds and other animals could not build their nests in the exotic plants.

3.17 Legal strength of combating wildlife offense in Bangladesh

Serious crime like wildlife business needs well legal support to combat. In Bangladesh, fight against wildlife crime supported by some strong laws. Proper application of these laws can effectively result the reduction of wildlife business. The laws are as following:

The Constitution of Bangladesh, article- 18A **(The state shall endeavour to protect and improve the environment and to preserve and safeguard the natural resources, bio-diversity, wetlands, forest and wildlife for the present and future citizens.)**

- 🔦 Wildlife (Conservation and Security) Act, 2012

- 🔦 The Special Power Act, 1974

3.17.1 Stakeholders of combating Wildlife crime

Legal activities and coordination of law enforcing agencies can create a vibrant work to combat wildlife crime thus leads to the gradual decreasing of the wildlife Smugglers and Dealers. Following Governmental agencies are responsible legally to fight against Wildlife business:

- 🔦 Bangladesh Forest Department

- 🔦 Bangladesh Police

- 🔦 Rapid Action Battalion (RAB) (Elite force of Bangladesh Police)

- 🔦 Border Guard Bangladesh (BGB)

- 🔦 Bangladesh Navy
- 🔦 Bangladesh Coast Guard
- 🔦 Bangladesh Customs

3.17.2 Challenges

The challenges have been found during the study period-

- 🔦 Lack of awareness about wildlife values and conservation;
- 🔦 Weak co-ordination among the different law enforcing agencies in national level;
- 🔦 Lack of logistics and personnel supports;
- 🔦 Absence of hi-tech methods (e.g., for detection, forensic test, etc.);
- 🔦 Porous Border line;
- 🔦 Strong network of dealers"/poachers" syndicate; and
- 🔦 Taking long time for judicial trial of Wildlife trade cases.

Most of the dealers subsist on this occupation. They are not so conscious about wildlife, nature and/or ecosystem. They do not know how wildlife keep balance of nature, how much we are dependent on natural habitats, ecosystems, etc. They do not know about the rules of CITES, even these people do not know about the government laws and orders. People in rural areas do not know whether this business is illegal or not. So, trapping, hunting and business of wildlife cannot be stopped.

As there is demand of wildlife in the markets, we cannot stop the illegal business. So, we have to create scopes other than capturing them from nature. Effective conservation policies and proper implementation of law can reduce the problems. Besides, more research work is necessary that will give us ideas how we can save our wildlife.

LIST OF TABLES

Table 1: Location of the organized wildlife trade markets in Bangladesh

Serial no.	Name of the market	Location	District
1.	Dhaka University market, Kataban	Kataban	Dhaka
2.	Kaptan Bazar	Sutrapur	Dhaka
3.	Shakhari Bazar turtle selling center	Kotowali	Dhaka
4.	Bakterpur (snake charmers" village)	Savar	Dhaka
5.	Tongi Bazar, Gazipur	Tongi	Gazipur
6.	Reazuddin Bazar, Chittagong	Kotowali	Chittagong
7.	Sadar Bazar frog selling point	Sadar	Bandarban
8.	Upazila Bazar turtle selling point	Sadar	Gopalganj
9.	Upazila Bazar turtle selling point	Kotalipara	Gopalganj
10.	Mohangonj Upazila market turtle selling point	Mohangonj	Netrokona
11.	Part of the Sundarbans	Dacope	Khulna
12.	Sadar Upazila Bazar	Sadar	Bagerhat

Table 2: Location of unorganized traders in Bangladesh

Serial no.	Trade spot	District
1.	Mirpur-10 square	Dhaka
2.	Uttara Rajlaxmi complex	Dhaka
3.	Shahid Faruk road, Jatrabari	Dhaka
4.	TSC area, University of Dhaka	Dhaka
5.	Rasel square, Gulistan	Dhaka
6.	Mirpur majar road, Mirpur-1	Dhaka
7.	Rampura	Dhaka
8.	Shyamoli	Dhaka
9.	Dhaka college	Dhaka
10.	Bongshal	Dhaka
11.	Farmgate	Dhaka
12.	Tantibazar	Dhaka
13.	Sector-11, Uttara	Dhaka
14.	Savar bazar	Dhaka
15.	Keranigonj	Dhaka
16.	Dohar	Dhaka
17.	Fantasy kingdom, Ashulia	Dhaka
18.	Birulia bazar, Savar	Dhaka
19.	Kaligonj rail gate	Gazipur
20.	Gazipur chowrasta	Gazipur
21.	Rajendropur	Gazipur
22.	Vatiaparamor, Muksudpur	Gopalganj
23.	New market	Chittagong
24.	Kazir Deuri	Chittagong
25.	Khatungonj	Chittagong
26.	Mehedibag	Chittagong
27.	Hajipara, Halishahar	Chittagong
28.	Shitakundo	Chittagong

Table 2 (Continued): Location of unorganized traders in Bangladesh

Serial no.	Trade spot	District
29.	Traffic mor	Bandarban
30.	Marma bazar	Bandarban
31.	Ruma bazar	Bandarban
32.	Shonadanga bus stand	Khulna
33.	Doulatpur	Khulna
34.	Rupshaghat	Khulna
35.	Shibbarimor	Khulna
36.	Shiromoni bazar	Khulna
37.	Mirerdanga	Khulna
38.	Dacope bazar	Khulna
39.	Khanjahan Ali majar area	Bagerhat
40.	Sadar bazar	Netrokona

Table 3: Overall number of species and their number of individuals were ready to sell in the markets during 2011-2014

Year	Indigenous		Exotic	
	No. of species	No. of individuals	No. of species	No. of individuals
2011	42	3,37,318	15	1,55,071
2012	38	2,99,995	13	1,72,067
2013	38	2,23,394	12	1,46,994
2014	38	2,37,851	12	1,39,215
Grand total	57	10,98,558	17	6,13,347
%	77.03	64.17	22.97	35.83

Table 4: Total List of sold individuals and species according to groups in the study period (2011-2014)

2011						
Animals	No. of Species	No. of Indigenous Species	No. of Exotic Species	No. of Indigenous Individuals	No. of Exotic Individuals	Total No. of Individuals
Amphibians	2	2	--	17,546	--	17,546
Reptiles	14	14	--	18,670	--	18,670
Birds	33	22	11	2,56,323	1,32,730	3,89,053
Mammals	8	4	4	44,779	22,341	67,120
Total	57	42	15	3,37,318	1,55,071	4,92,389
2012						
Animals	Number of Species	No. of Indigenous Species	No. of Exotic Species	No. of Indigenous Individuals	No. of Exotic Individuals	Total No. of Individuals
Amphibians	2	2	--	18,964	--	18,964
Reptiles	14	14	--	16,943	--	16,943
Birds	27	17	10	2,30,143	1,48,478	3,78,621
Mammals	8	5	3	33,945	23,589	57,534
Total	51	38	13	2,99,995	1,72,067	4,72,062

**Table 4 (Continued): Total List of sold individuals and species according to groups
in the study period (2011-2014)**

2013						
Animals	Number of Species	Number of Indigenous Species	No. of Exotic Species	Number of Indigenous Individuals	Number of Exotic Individuals	Total No. of Individuals
Amphibians	2	2	--	16,288	--	16,288
Reptiles	14	14	--	13,452	--	13,452
Birds	26	17	9	1,65,276	1,23,774	2,89,050
Mammals	8	5	3	28,378	23,220	51,598
Total	50	38	12	2,23,394	1,46,994	3,70,388
2014						
Animals	No. of Species	No. of Indigenous Species	No. of Exotic Species	No. of Indigenous Individuals	No. of Exotic Individuals	Total No. of Individuals
Amphibians	2	2	--	16,171	--	16,171
Reptiles	14	14	--	13,619	--	13,619
Birds	27	18	9	1,78,790	1,18,018	2,96,808
Mammals	7	4	3	29,271	21,197	50,468
Total	50	38	12	2,37,851	1,39,215	3,77,066
Grand Total	74	57	17	10,98,558	6,13,347	17,11,905

Table 5: Wildlife recovered from different operations during 2012 to 2016

Serial no.	Year	No. of cases	No. of arrested offenders	Animals recovered			
				Amphibians	Birds	Reptiles	Mammals
1	2012	55	119	-	1,549	2,334	23
2	2013	34	65	-	1,927	2,843	45
3	2014	68	146	-	1,232	2,200	54
4	2015	45	37	-	3,358	5,395	41
5	2016	71	46	-	4,183	6,501	67
Total	-	273	413	-	12,249	19,273	230
Sources: Bangladesh Forest Department (BFD), Bangladesh Police							

Table 6: (z-test 2011-2012)

Indigenous animals (2011-2012)									
	2011	2012	$\hat{p}_1$	$\hat{p}_2$	$\hat{p}$	$1-\hat{p}$	$\hat{p}_1 - \hat{p}_2$	z value calculation	z test
Amphibians (y1)	17,546	18,964	0.0520	0.0632	0.0573	0.9427	-0.0112	-19.2012	19.2012
Reptiles (y2)	18,670	16,943	0.0553	0.0565	0.0559	0.9441	-0.0011	-1.9591	1.9591
Birds (y3)	256,323	230,143	0.7599	0.7672	0.7633	0.2367	-0.0073	-6.8162	6.8162
Mammals (y4)	44,779	33,945	0.1328	0.1132	0.1235	0.8765	0.0196	23.7339	23.7339
total (n1,n2)	337,318	299,995	-	-	-	-	-	-	-
Total (n1+n2=n)	637,313	-	-	-	-	-	-	-	-
(1/n1)+(1/n2)	0.0000062980	-	-	-	-	-	-	-	-

Table 7: (z-test 2012-2013)

Indigenous animals (2012-2013)									
	2012	2013	$\hat{p}_1$	$\hat{p}_2$	$\hat{p}$	$1-\hat{p}$	$\hat{p}_1 - \hat{p}_2$	z value calculation	z test
Amphibians (y1)	18,964	16,288	0.0632	0.0729	0.0674	0.9326	-0.0097	-13.8448	13.8448
Reptiles (y2)	16,943	13,452	0.0565	0.0602	0.0581	0.9419	-0.0037	-5.7204	5.7204
Birds (y3)	230,143	165,276	0.7672	0.7398	0.7555	0.2445	0.0273	22.7420	22.7420
Mammals (y4)	33,945	28,378	0.1132	0.1270	0.1191	0.8809	-0.0139	-15.3344	15.3344
total (n1,n2)	299,995	223,394	-	-	-	-	-	-	-
Total (n1+n2=n)	523,389	-	-	-	-	-	-	-	-
(1/n1)+(1/n2)	0.0000078098	-	-	-	-	-	-	-	-

Table 8: (z-test 2013-2014)

Indigenous animals (2013-2014)									
	2013	2014	$\hat{p}_1$	$\hat{p}_2$	$\hat{p}$	$1-\hat{p}$	$\hat{p}_1 - \hat{p}_2$	z value calculation	z test
Amphibians (y1)	16,288	16,171	0.0729	0.0680	0.0704	0.9296	0.0049	6.5335	6.5335
Reptiles (y2)	13,452	13,619	0.0602	0.0573	0.0587	0.9413	0.0030	4.2713	4.2713
Birds (y3)	165,276	178,790	0.7398	0.7517	0.7460	0.2540	-0.0118	-9.2377	9.2377
Mammals (y4)	28,378	29,271	0.1270	0.1231	0.1250	0.8750	0.0040	4.0711	4.0711
total (n1,n2)	223,394	237,851	-	-	-	-	-	-	-
Total (n1+n2=n)	461,245	-	-	-	-	-	-	-	-
(1/n1)+(1/n2)	0.0000086807	-	-	-	-	-	-	-	-

Table 9: (z-test 2011-2014)

Indigenous animals (2011-2014)									
	2011	2014	$\hat{p}_1$	$\hat{p}_2$	$\hat{p}$	$1-\hat{p}$	$\hat{p}_1 - \hat{p}_2$	z value calculation	z test
Amphibians (y1)	17,546	16,171	0.0520	0.0680	0.0586	0.9414	-0.0160	-25.3932	25.3932
Reptiles (y2)	18,670	13,619	0.0553	0.0573	0.0561	0.9439	-0.0019	-3.0993	3.0993
Birds (y3)	256,323	178,790	0.7599	0.7517	0.7565	0.2435	0.0082	7.1324	7.1324
Mammals (y4)	44,779	29,271	0.1328	0.1231	0.1287	0.8713	0.0097	10.8011	10.8011
total (n1,n2)	337,318	237,851	-	-	-	-	-	-	-
Total (n1+n2=n)	575,169	-	-	-	-	-	-	-	-
(1/n1)+(1/n2)	0.0000071689	-	-	-	-	-	-	-	-

Table 10: (Sale of Indigenous wildlife from 2011 to 2014)

Year Group	2011	2012	2013	2014	Total
Amphibians (y1)	17,546	18,964	16,288	16,171	68,969
Reptiles (y2)	18,670	16,943	13,452	13,619	65,059
Birds (y3)	256,323	230,143	165,276	178,790	8,32,006
Mammals (y4)	44,779	33,945	28,378	29,271	1,32,524
Total	337,318	299,995	223,394	237,851	10,98,558

LIST OF FIGURES

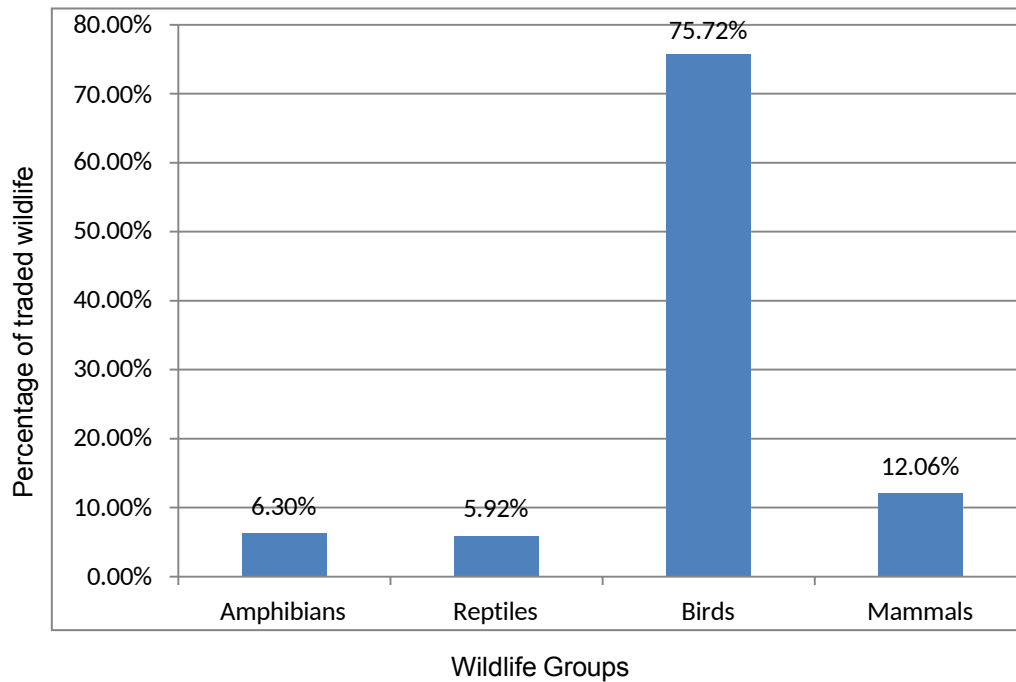


Figure 1: Population of traded indigenous wildlife groups according to species diversity

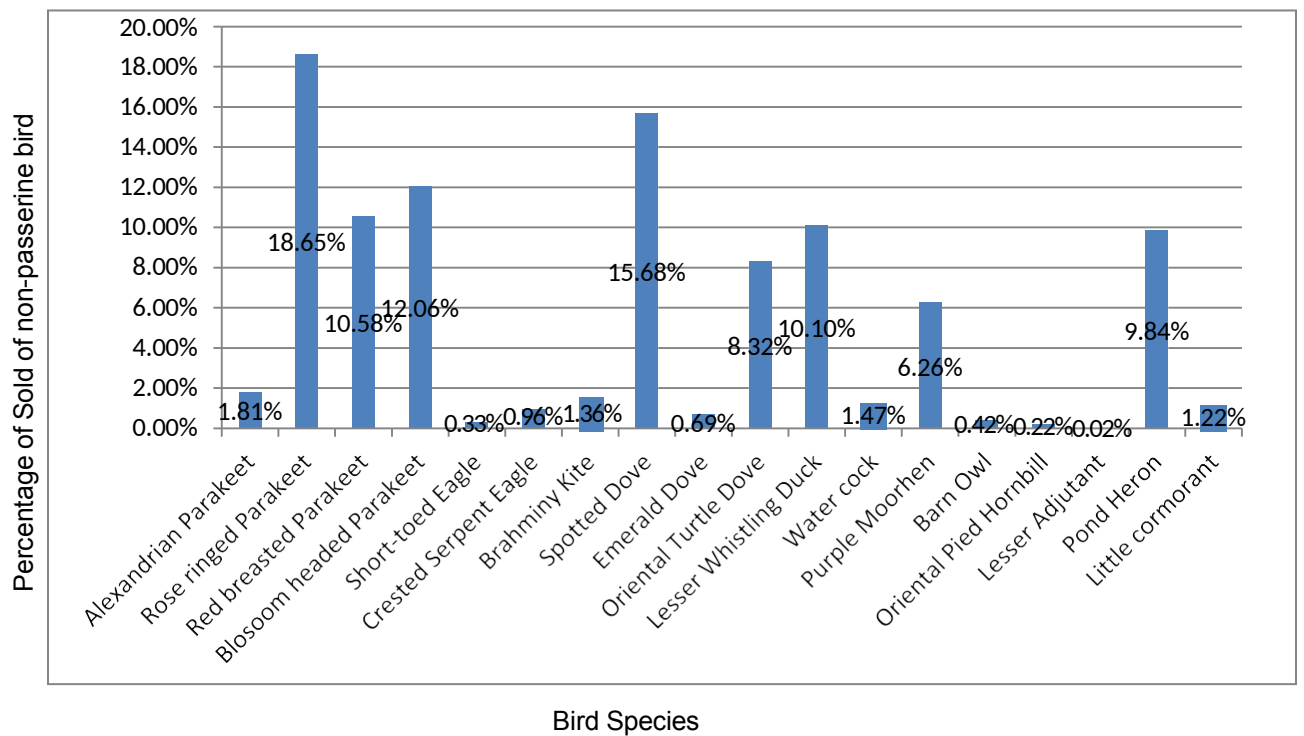


Figure 2: Selling of non-passerine & bird species

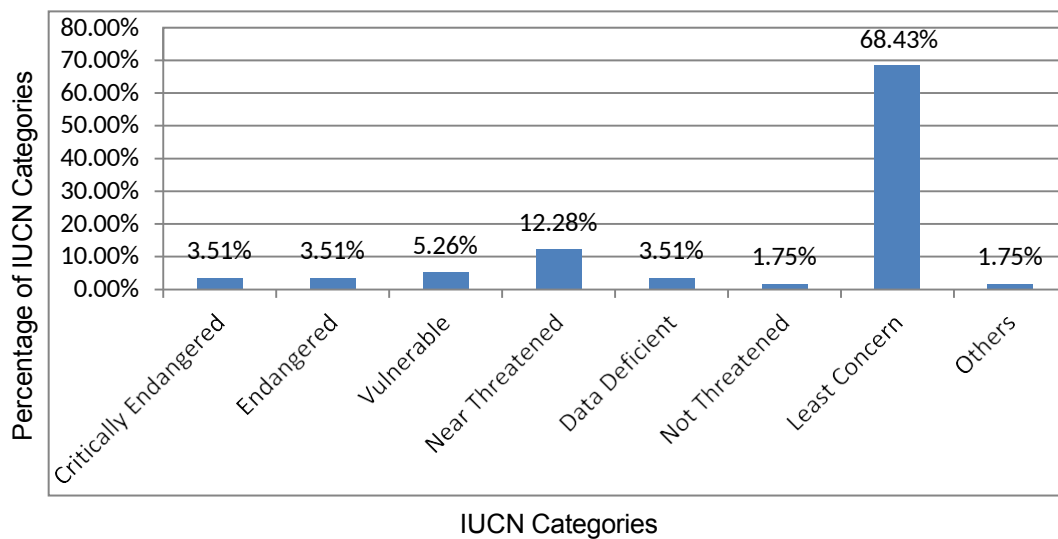


Figure 3: Status of the population of Indigenous species according to IUCN Bangladesh 2015 Categories (Threatened list)

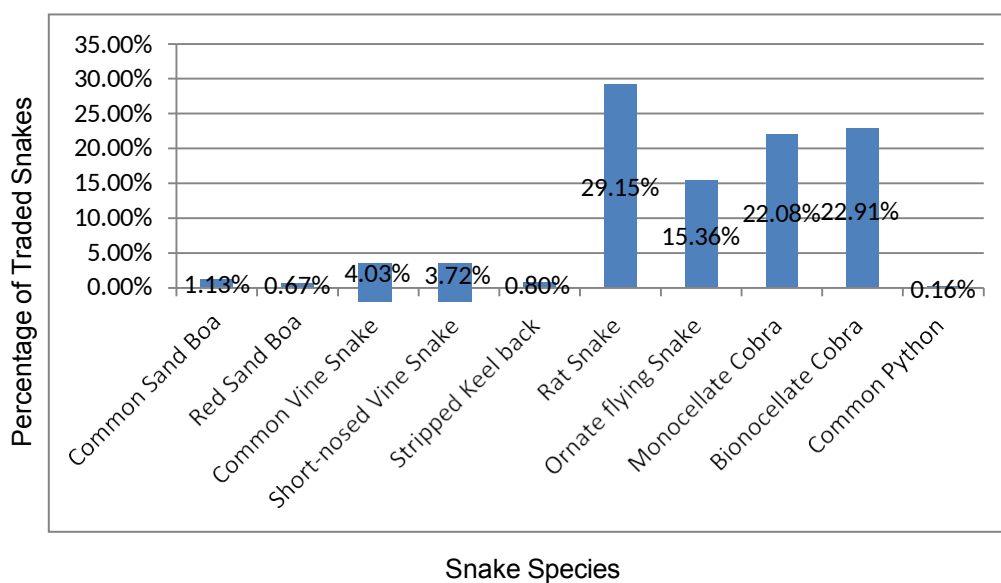


Figure 4: Trading of Snake species

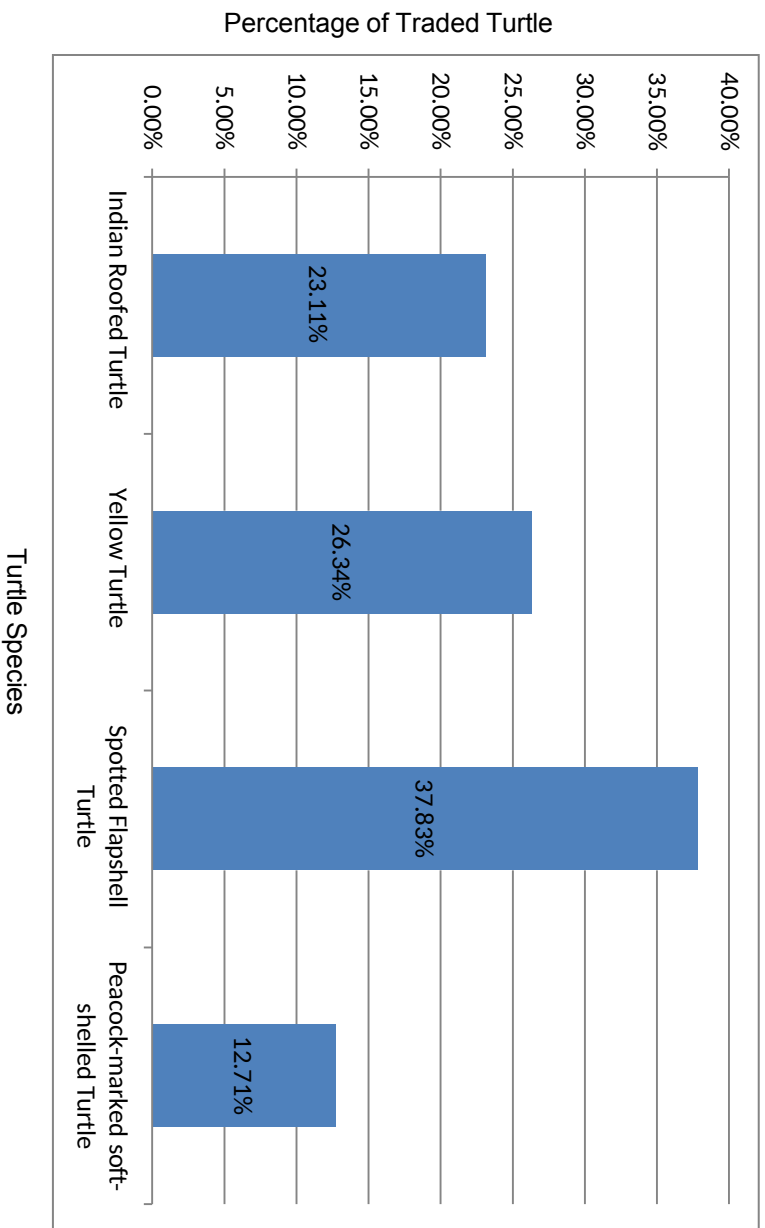


Figure 5: Business of Turtle Species

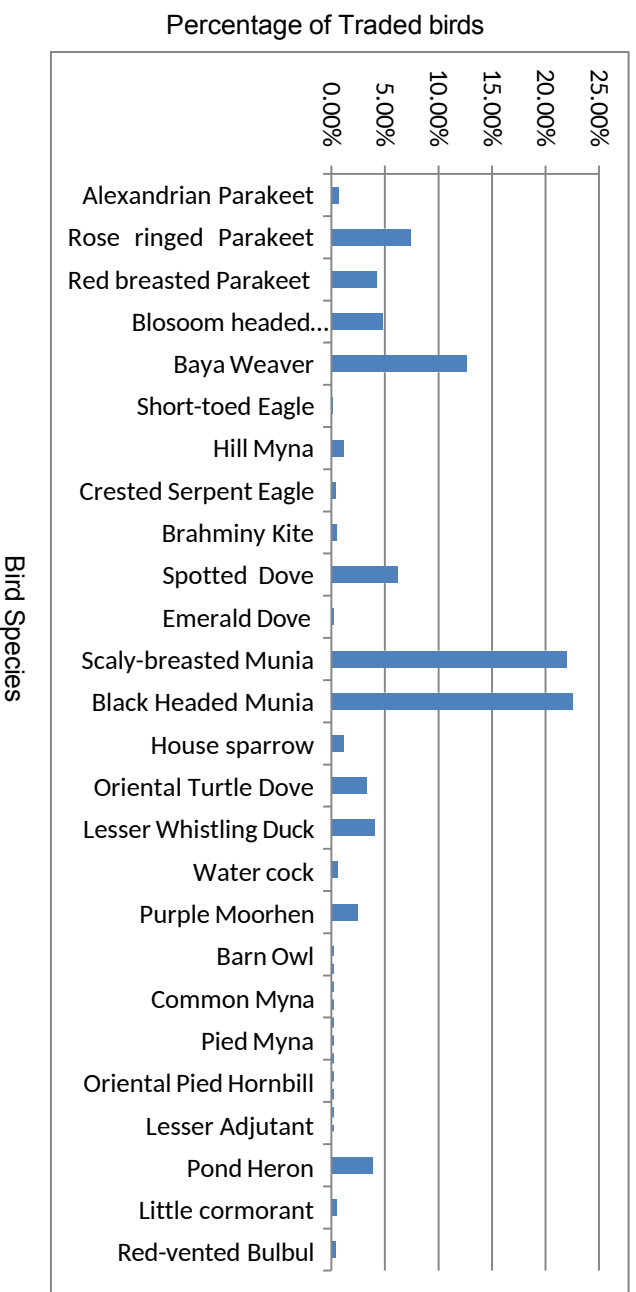


Figure 6: Business of birds according to bird species

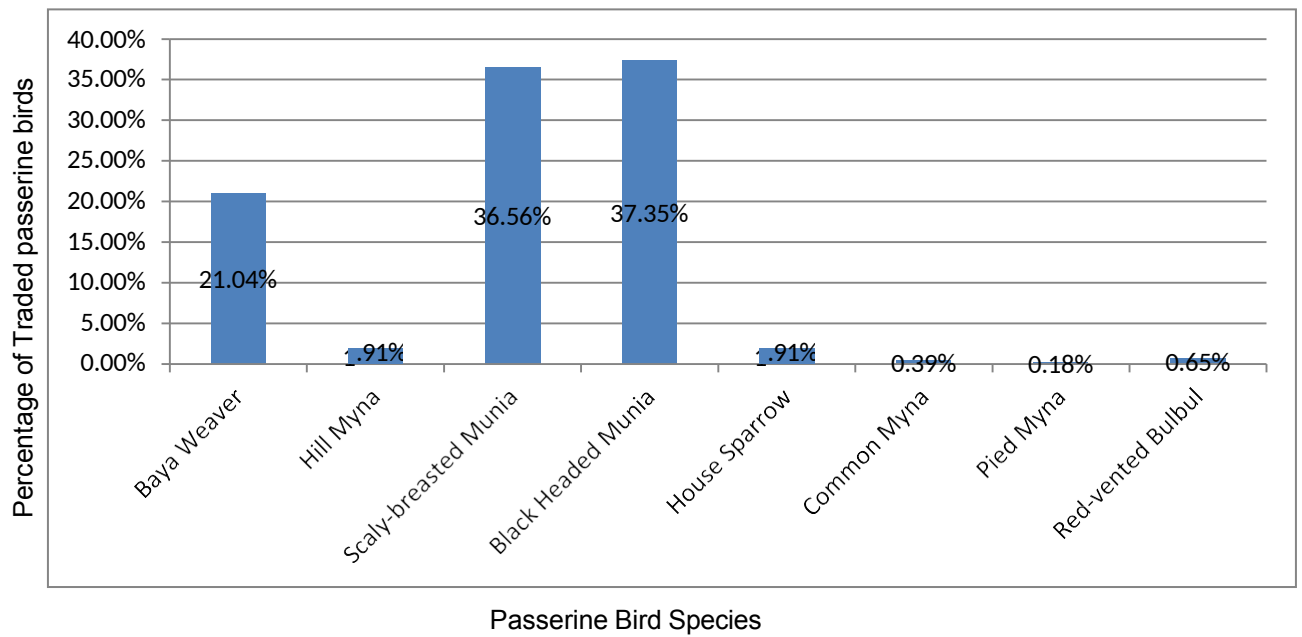


Figure 7: Selling of passerine bird species

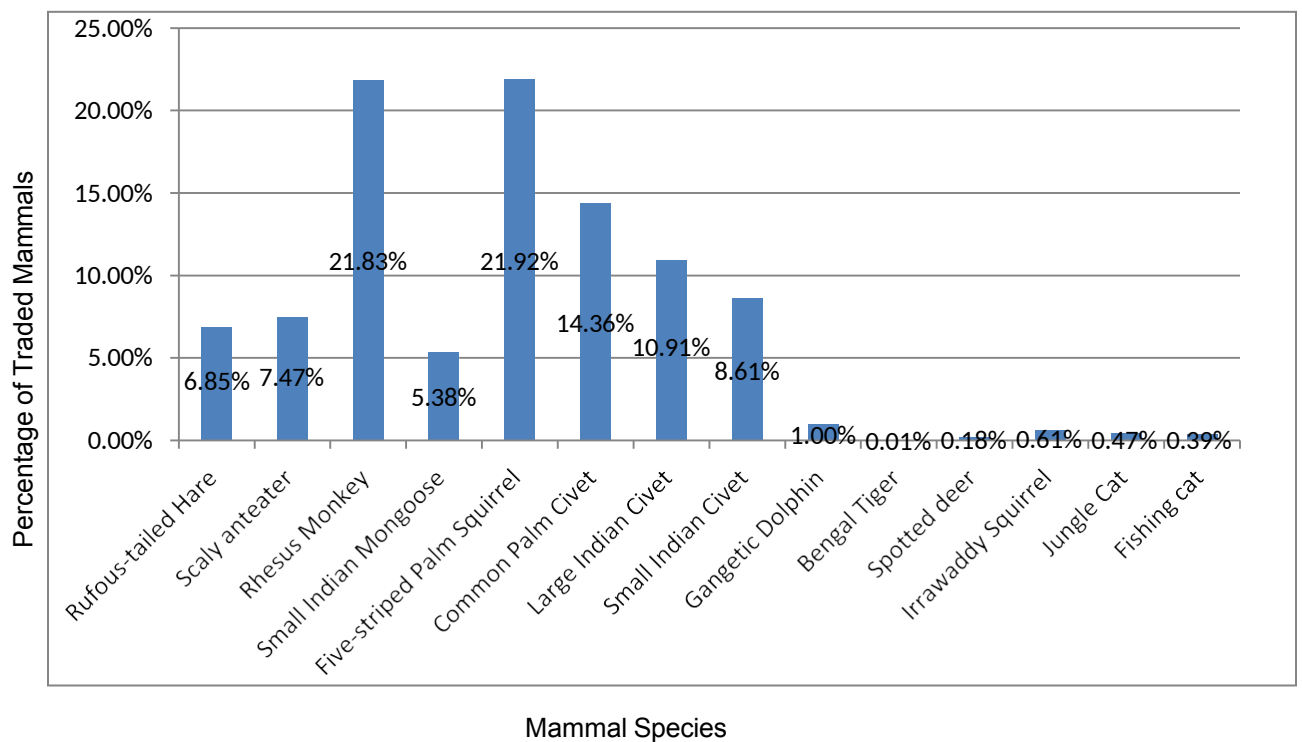


Figure 8: Trade of Mammal species

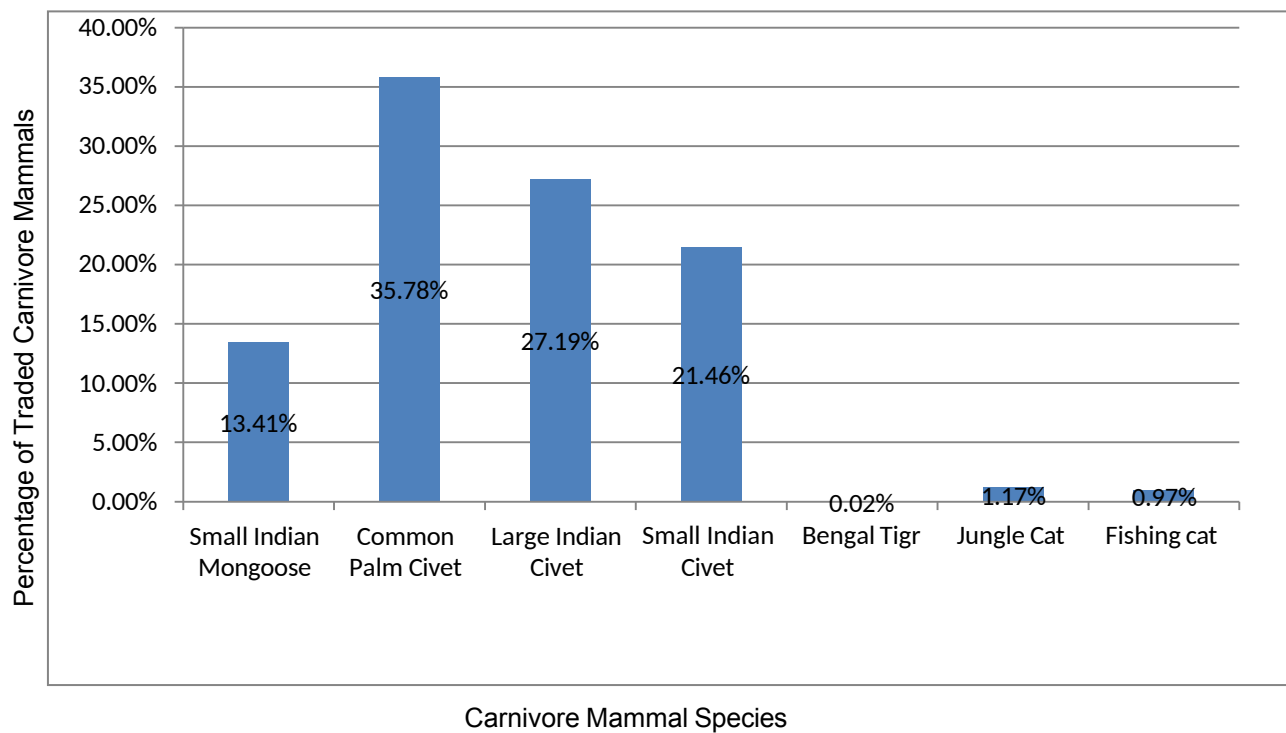


Figure 9: Trade of Carnivore Mammals species

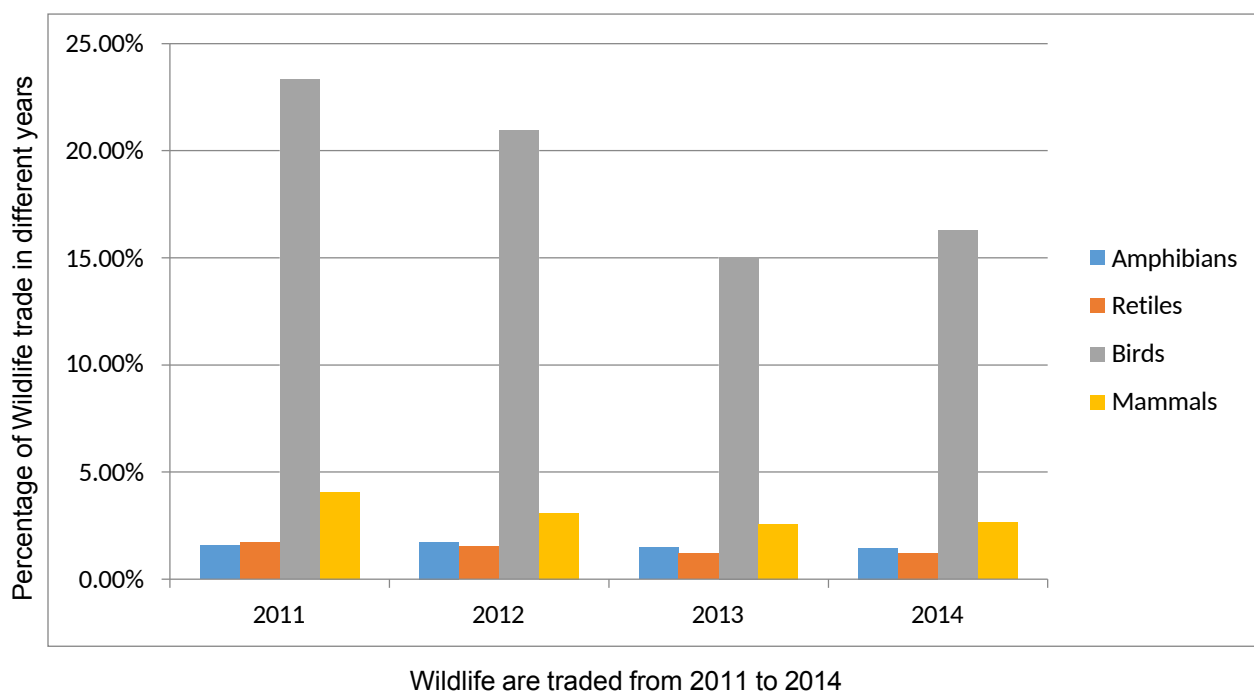


Figure 10: Wildlife trade in different year according to group

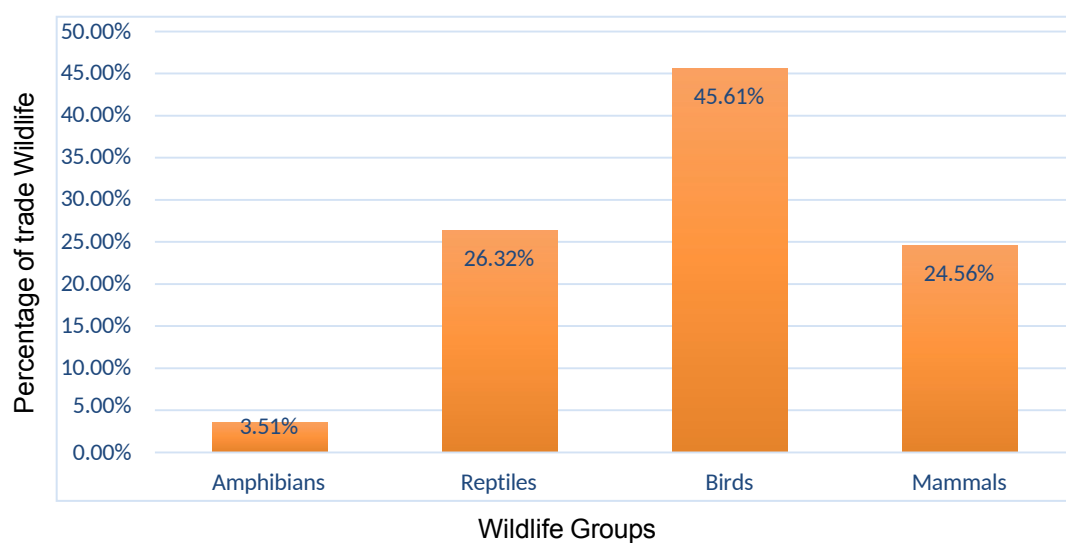


Figure 11: Status of sold Wildlife groups Indigenous species according to IUCN (Threatened) list

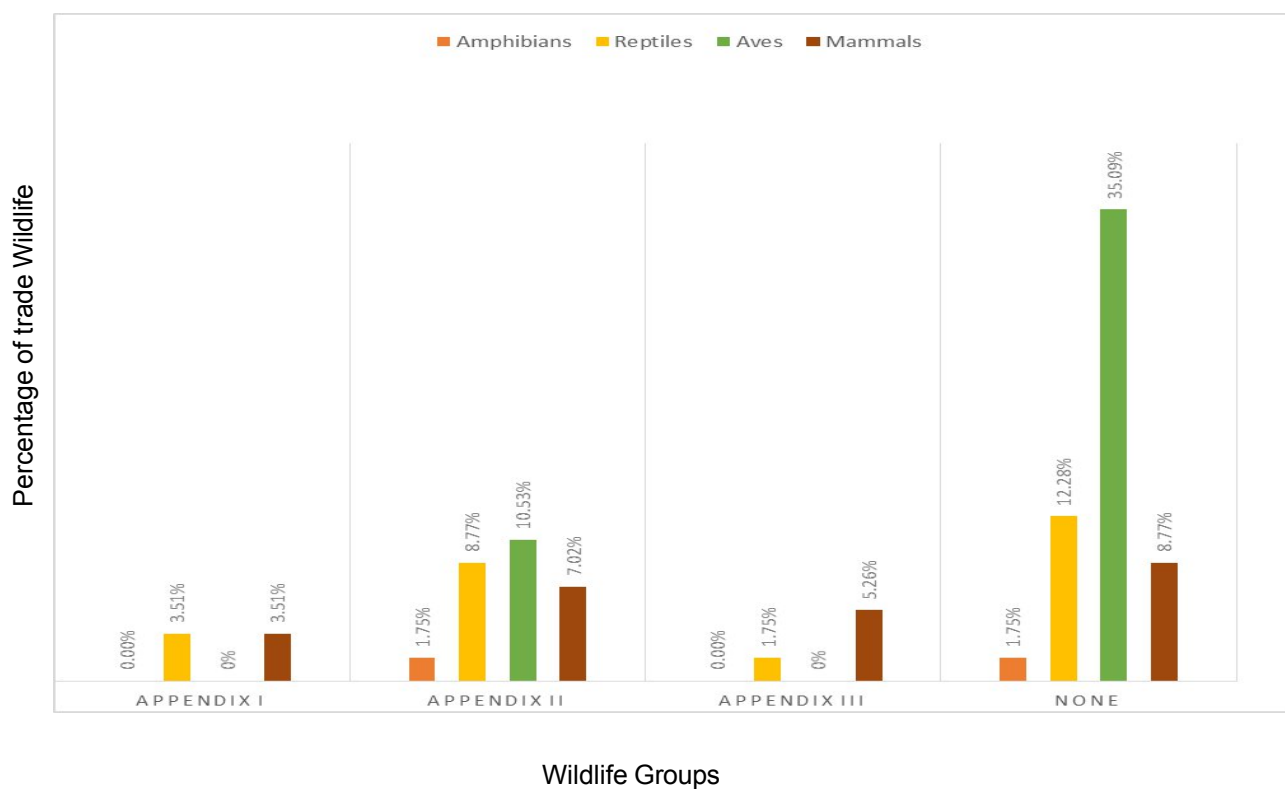


Figure 12: Status of sold Wildlife groups Indigenous species according to CITES appendices

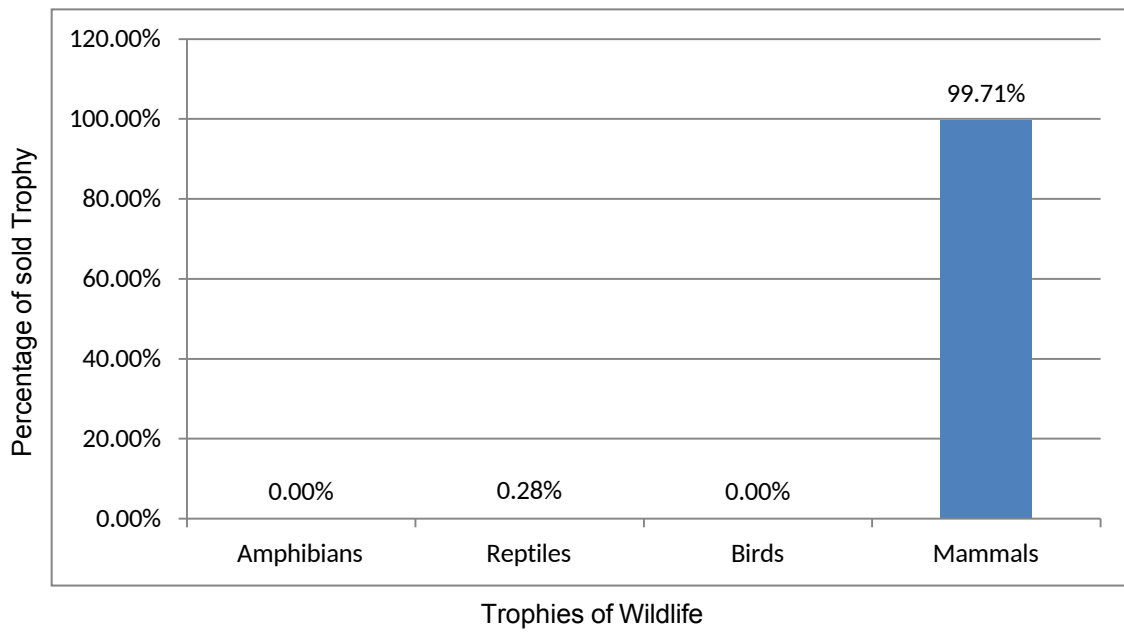


Figure 13: Sale of Indigenous Trophies of wildlife (Trophy)

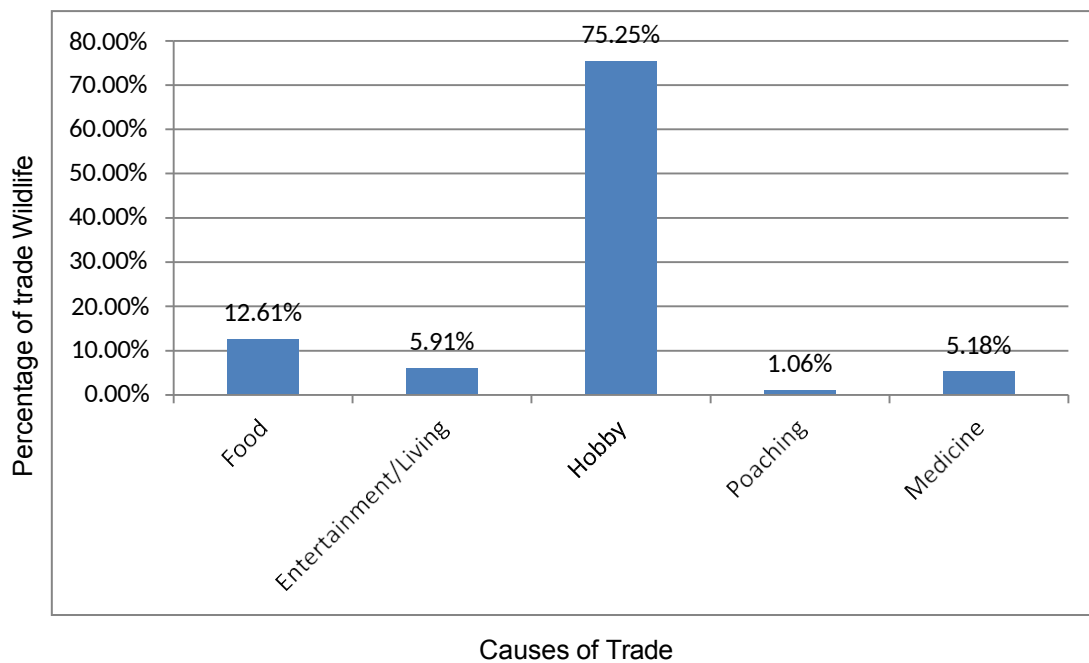


Figure 14: Causes of Trade of wildlife

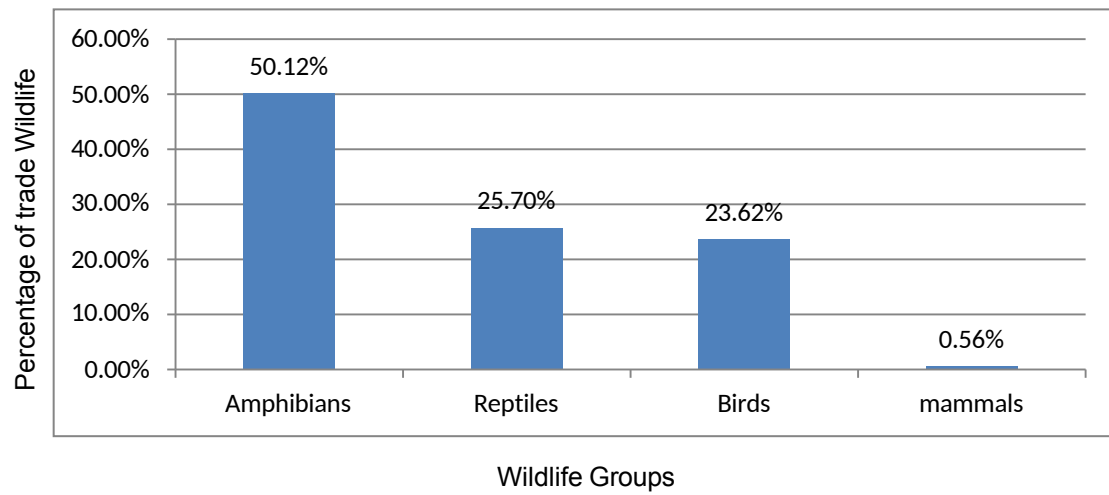


Figure 15: Causes of Trade of wildlife groups (Food aspect)

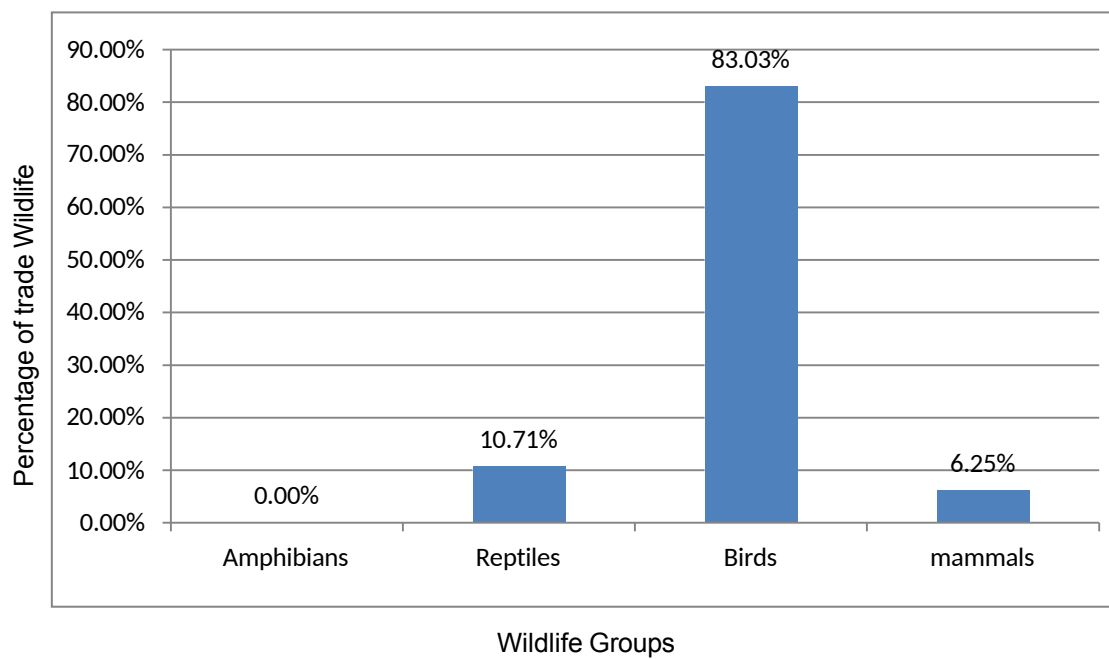


Figure 16: Causes of Trade of wildlife groups (Poaching)

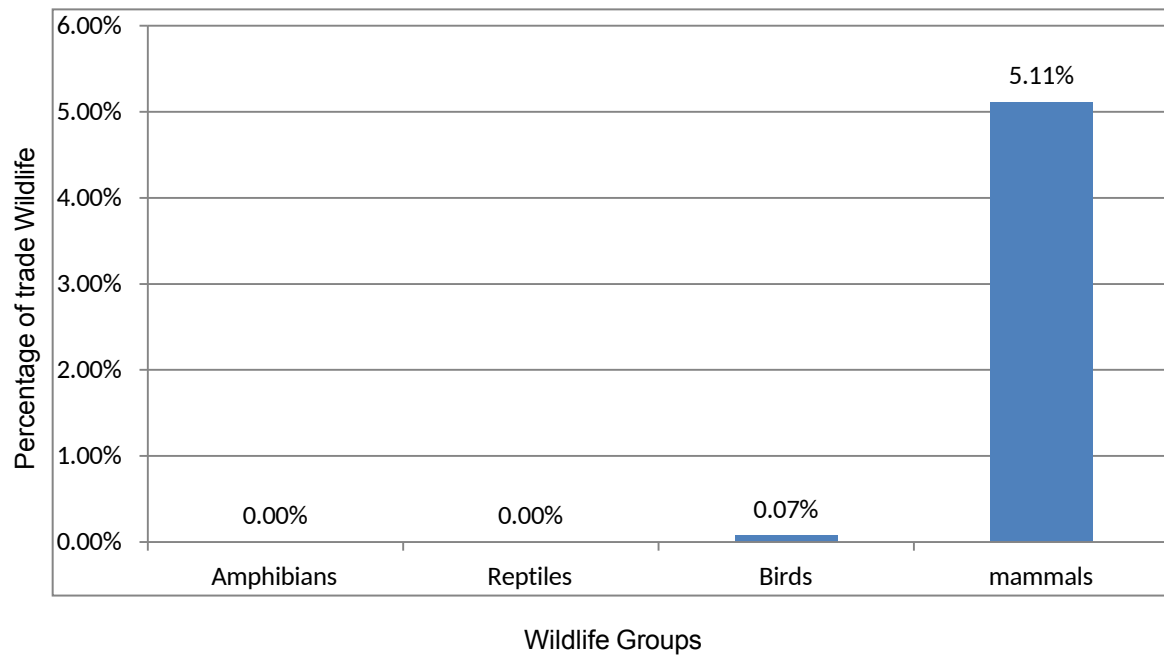


Figure 17: Causes of Trade of wildlife groups (Medicine)

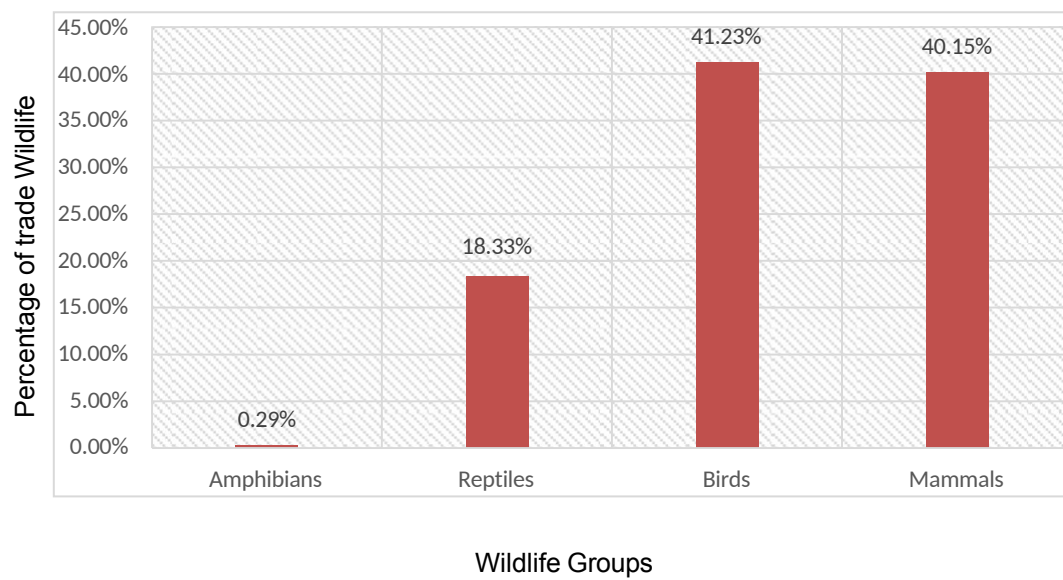


Figure 18: Sale of Indigenous wildlife groups

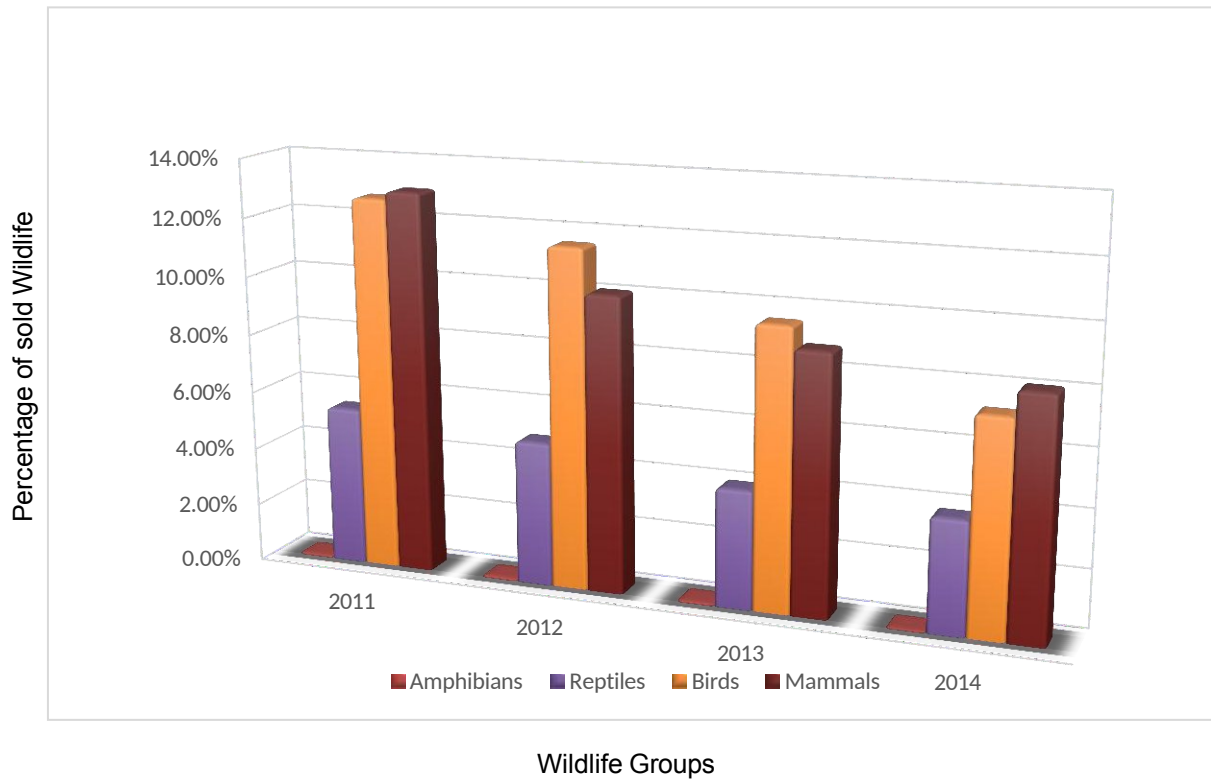


Figure 19: Yearly variation of the sale indigenous wildlife groups

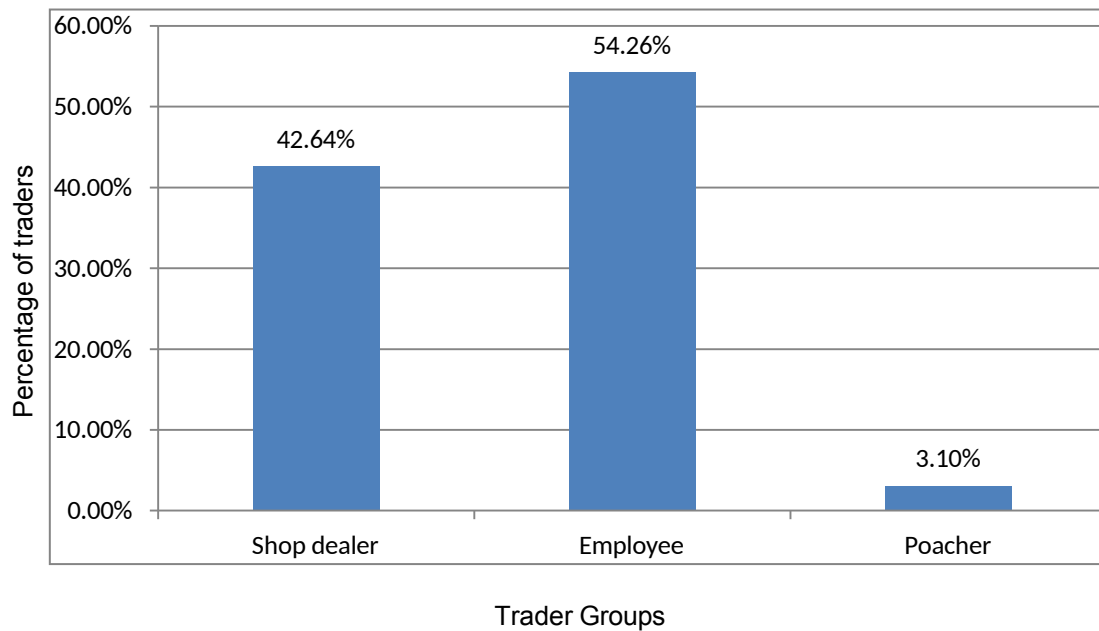


Figure 20: Organized trader groups

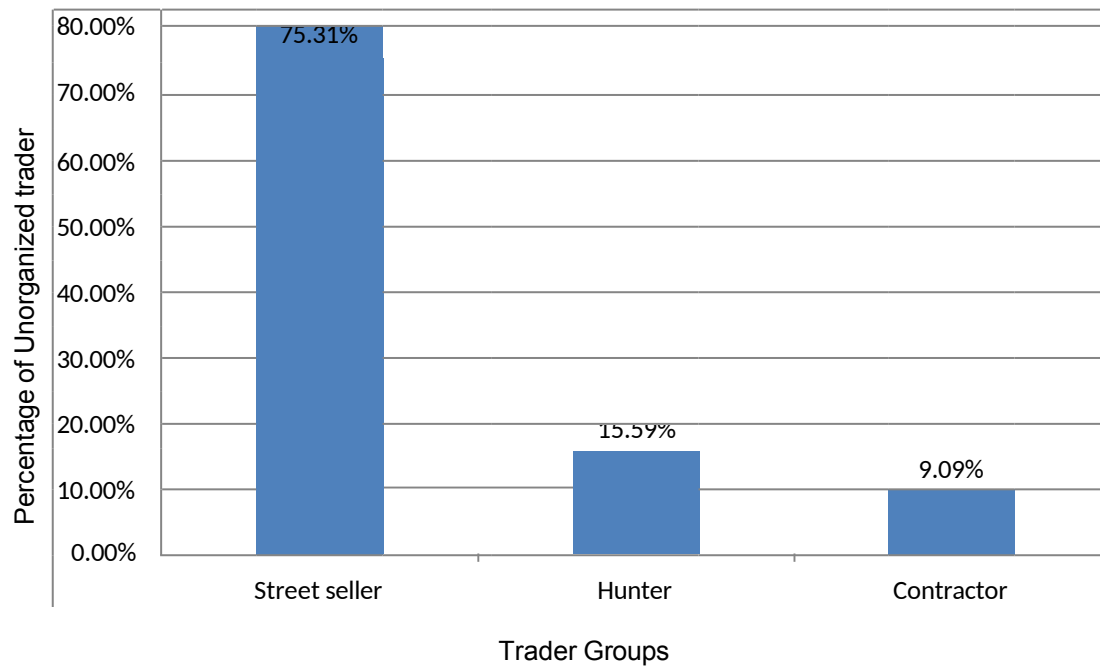


Figure 21: Unorganized trader groups

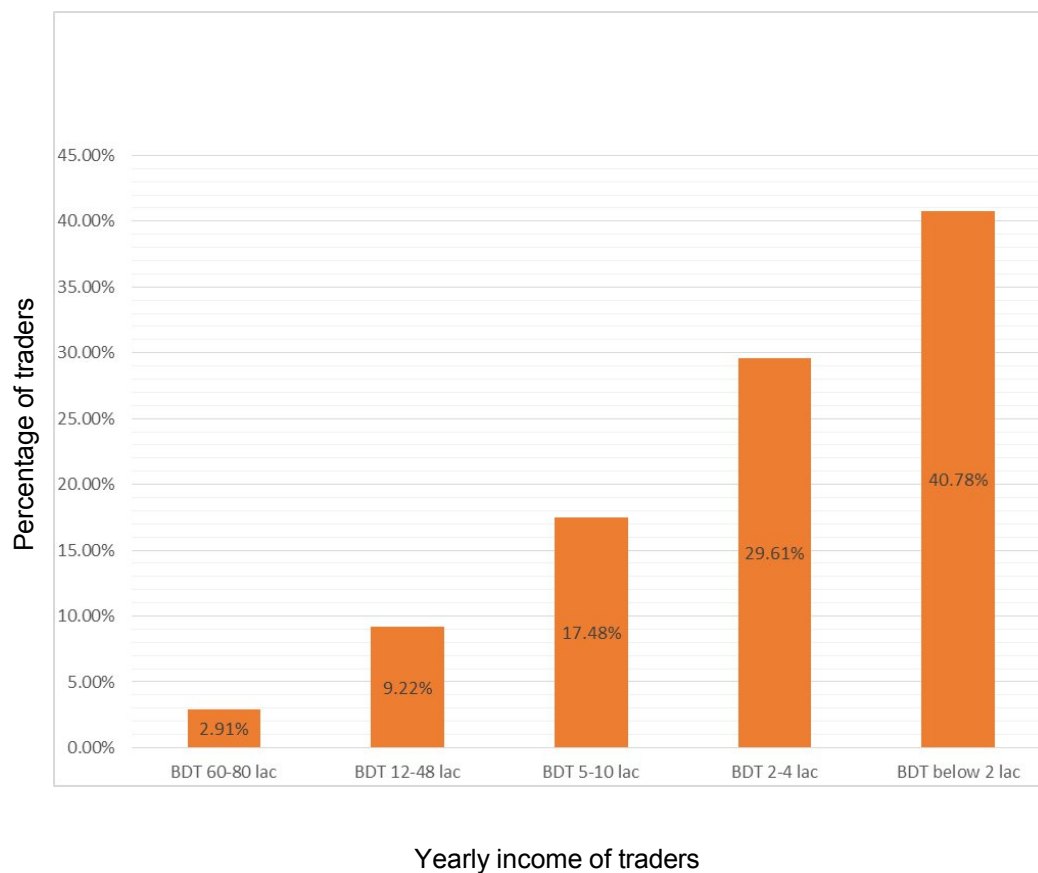


Figure 22: Economic Status

LIST OF PLATES



Plate 1: Rapid Action Battalion (RAB) rescued snakes at Keranigonj, Dhaka

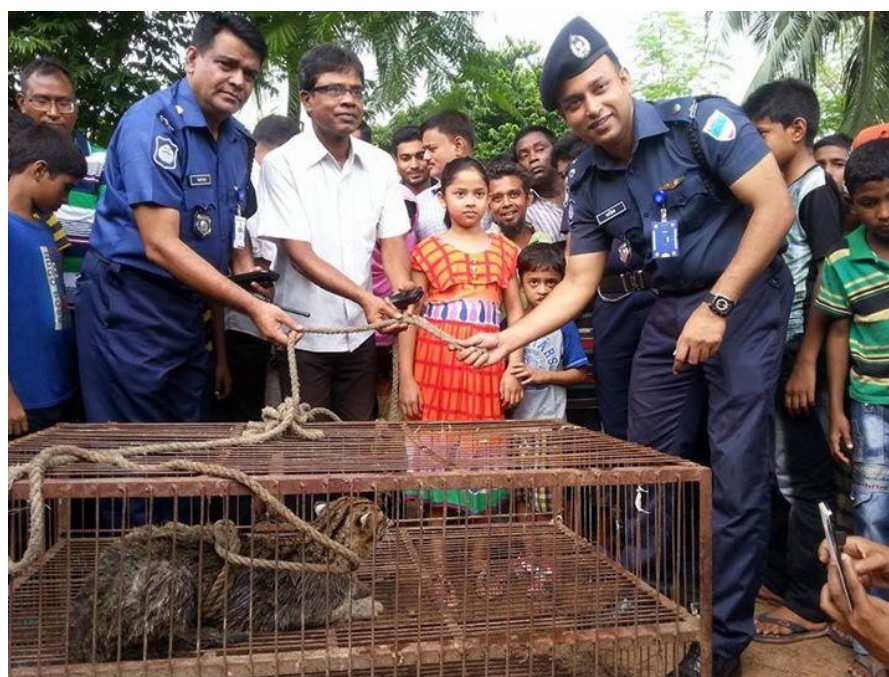


Plate 2: Police rescued and released a fishing cat in Magura



Plate 3: Lion and leopard cubs were rescued by Jessore police while poaching

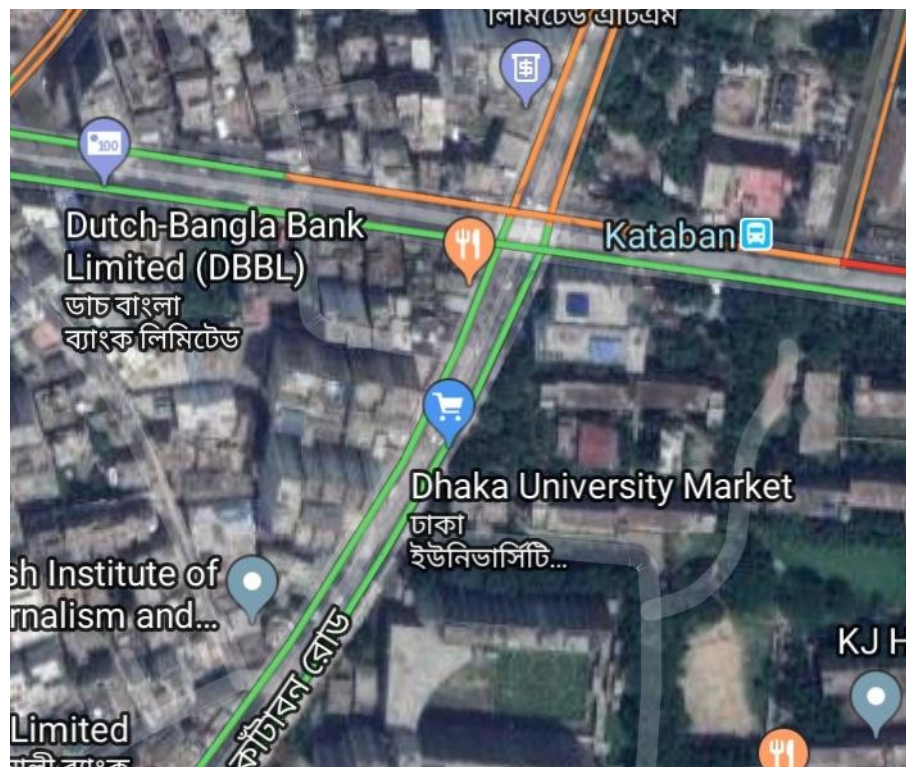


Plate 4: Satellite image of Dhaka University market at Kataban in Dhaka



Plate 5: Satellite image of Kaptan Bazar, Dhaka

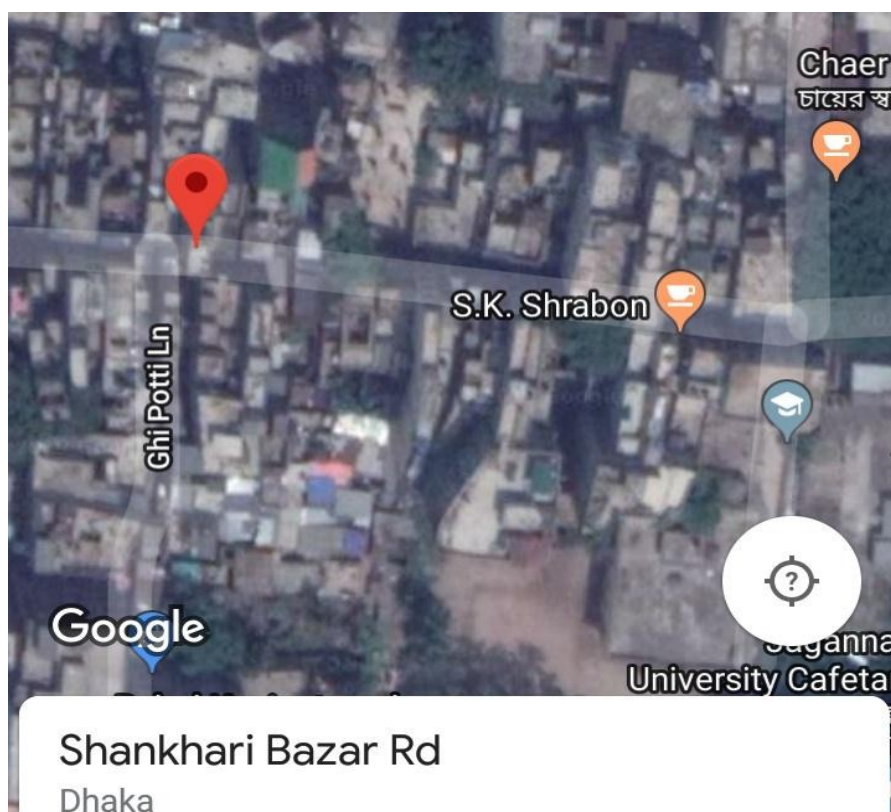


Plate 6: Satellite image of Shakhari Bazar turtle selling centre, Dhaka

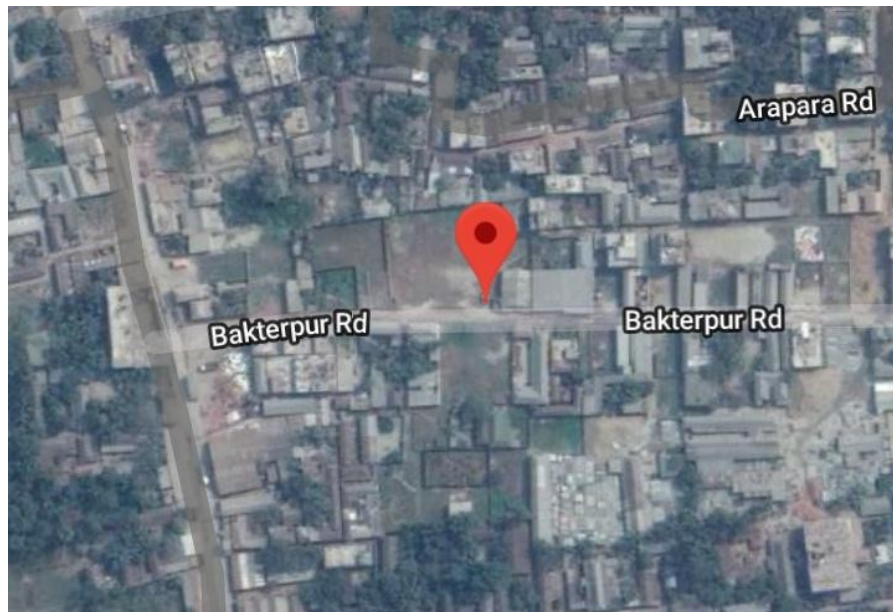


Plate 7: Satellite image of Bakterpur (Snake charmers" village), Savar, Dhaka

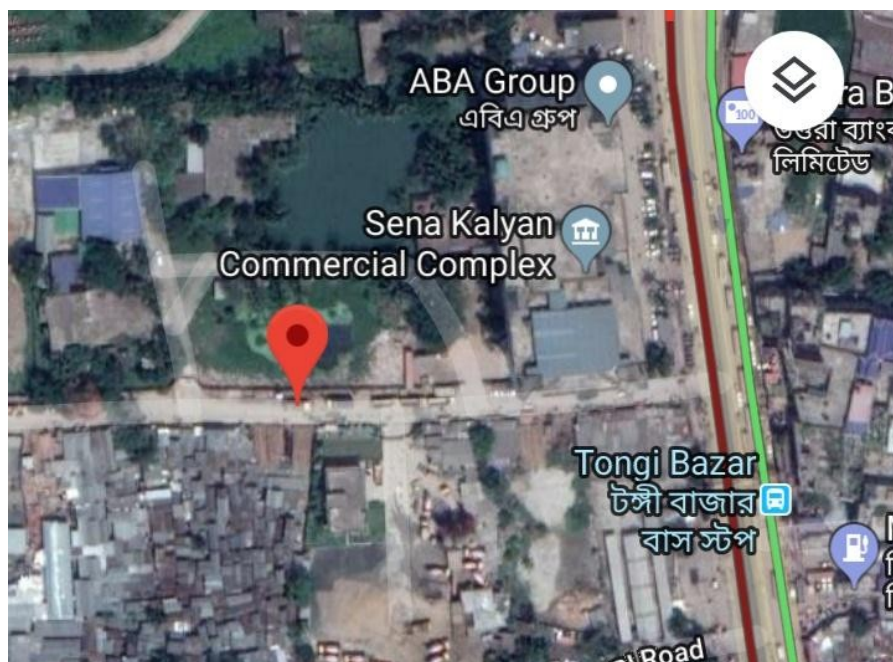


Plate 8: Satellite image of Tongi Bazar, Gazipur

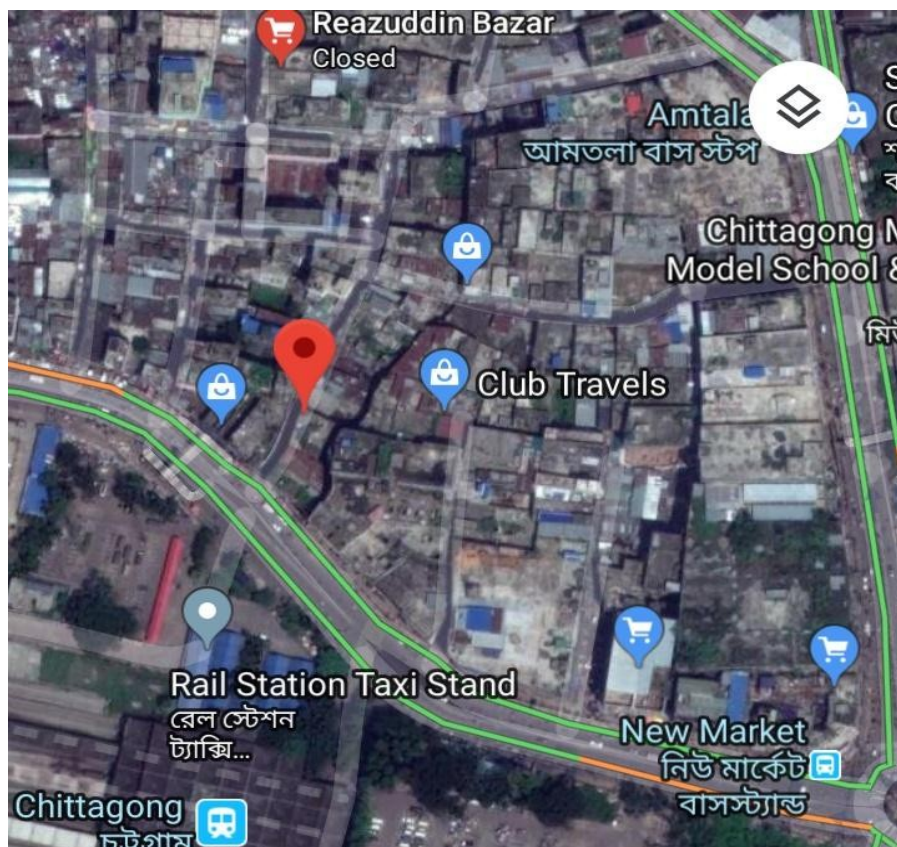


Plate 9: Satellite image of Reazuddin Bazar, Chittagong



Plate 10: Satellite image of Bandarban Sadar Bazar

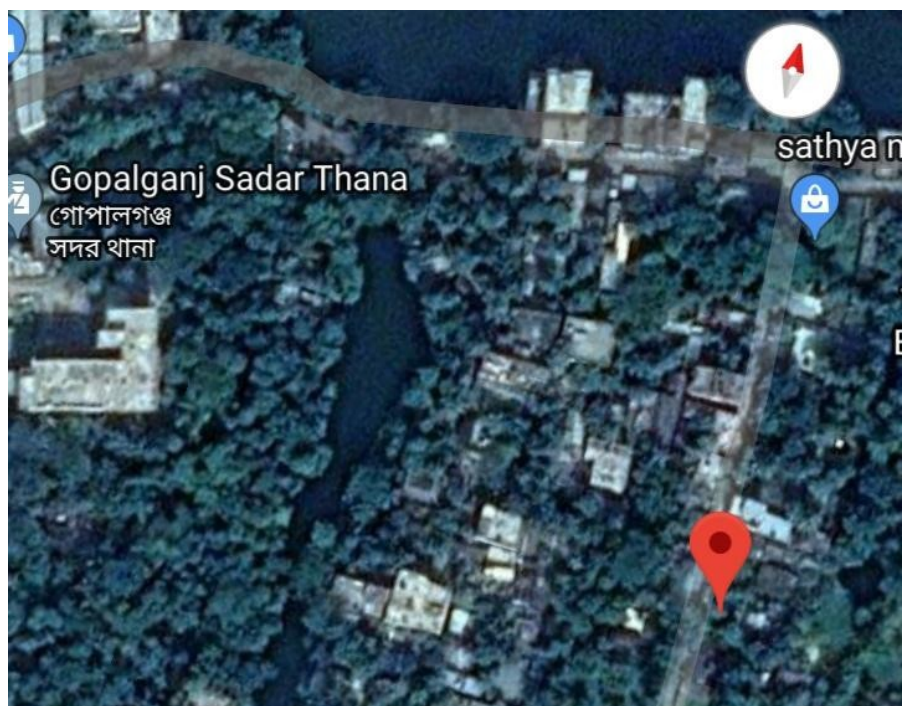


Plate 11: Satellite image of Sadar Upazila turtle selling point, Gopalganj

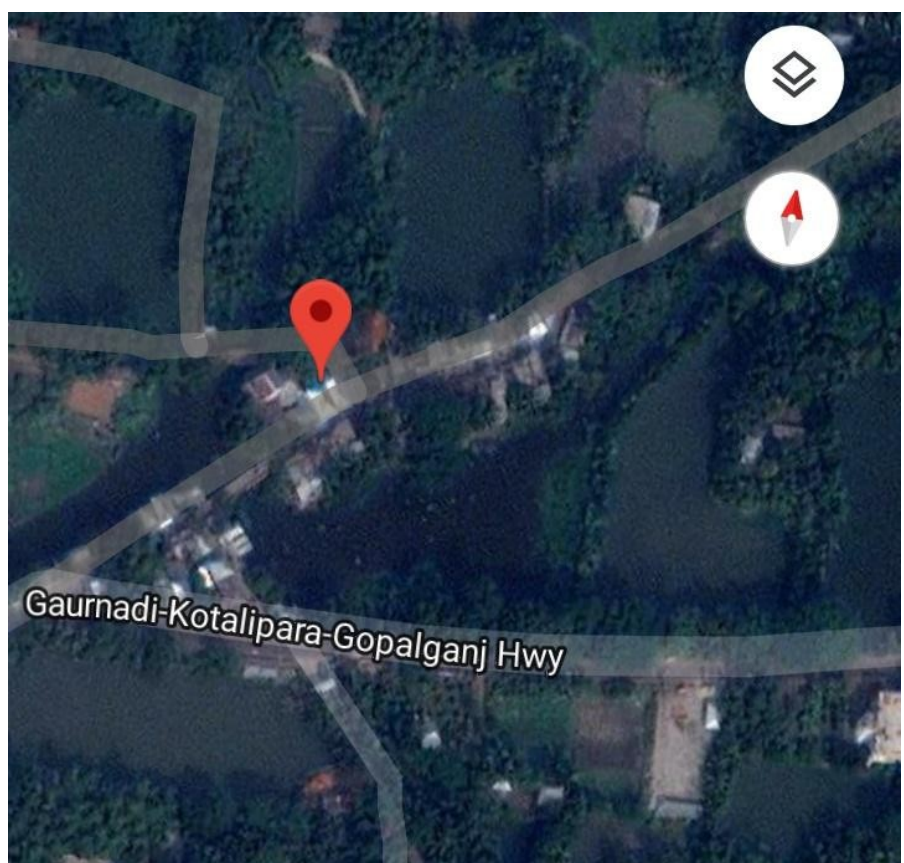


Plate 12: Satellite image of Kotalipara Upazila turtle selling point, Gopalganj

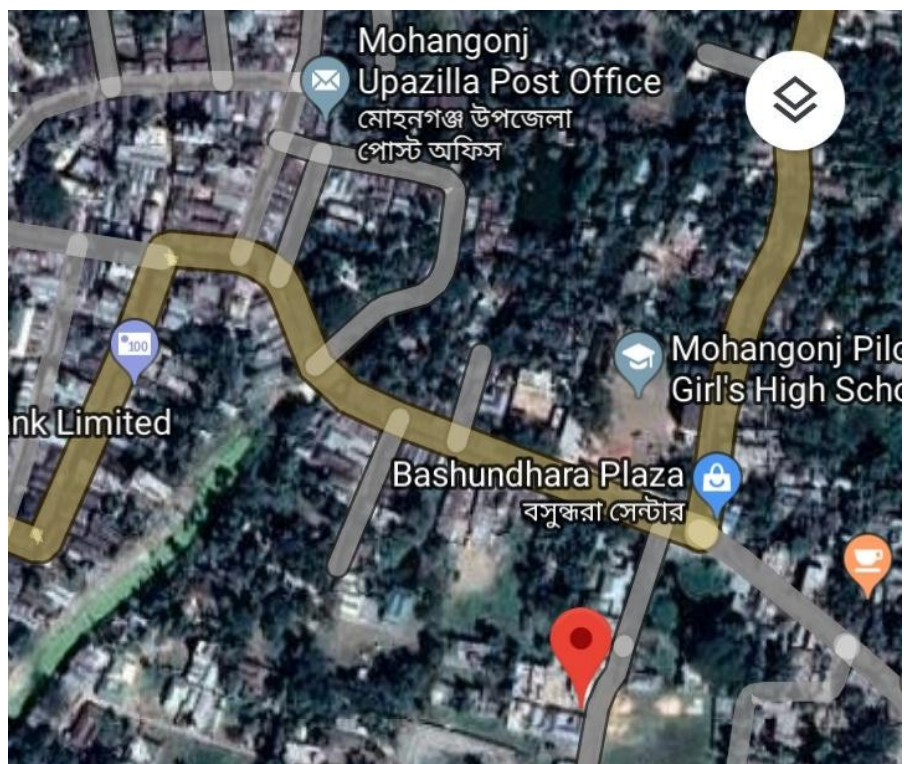


Plate 13: Satellite image of Mohangonj Sadar Bazar turtle selling point, Netrokona

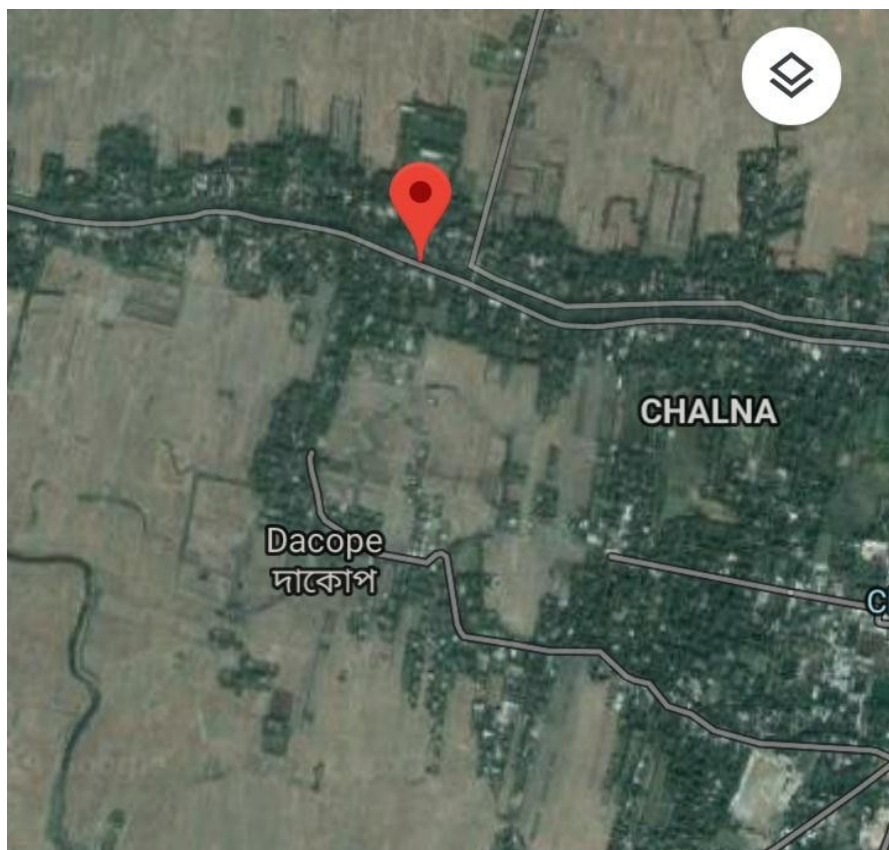


Plate 14: Satellite image of Sunderban at Dacope Upazila in Khulna

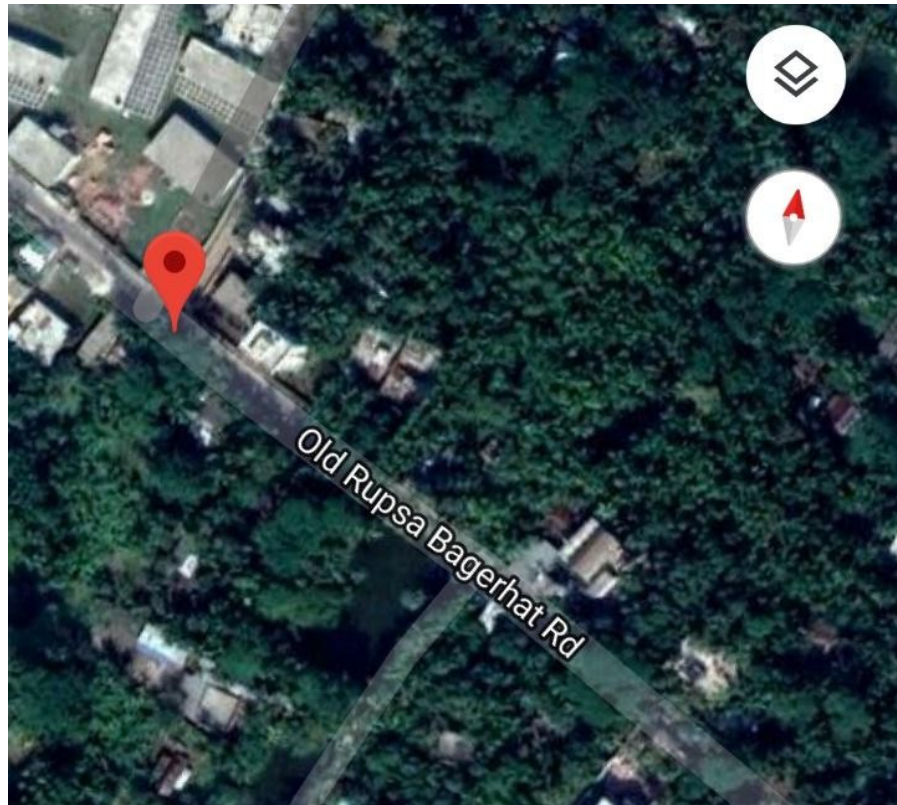


Plate 15: Satellite image of Sadar Upazila animal selling point, Bagerhat



Plate 16: Inauguration programme of sewing training for the young women at Snake Charmers village in Savar, Dhaka



Plate 17: Distribution of sewing machine among the female members of snake charmers by the Police Super of Dhaka District Mr. Habibur Rahman in Savar, Dhaka



Plate 18: Inauguration ceremony of driving training among the male snake charmers in Savar, Dhaka



Plate 19: Snake charmers left their old profession and took training on sewing for new chapter of life in Savar, Dhaka



Plate 20: An example of entrepreneurship and conservation programme against snake selling in Savar, Dhaka



Plate 21: Snake charmers is working in „Uttaran“ factory in Savar, Dhaka



Plate 22: Insight of the factory „Uttaran“



Plate 23: Awareness programme conducted among the students of Shahid Police Smriti School & College Mirpur, Dhaka



Plate 24: Leaflet and Poster distribution

বন্যপ্রাণি বাঁচলে বাঁচব আমরা,
বাঁচবে এই পৃথিবী।



আসুন আমরা
বন্যপ্রাণির অবৈধ
ব্যবসা রোধে
নিজেরা সচেতন
হই, অন্যদেরও
সচেতন করি।

Plate 25: Leaflet for raising the awareness

বন্যপ্রাণির ব্যবসা আইনত দণ্ডনীয় অপরাধ।



আসুন সোচ্চার হই।
বন্যপ্রাণির শিকারী ও
ব্যবসায়ীদের
আইনের হাতে সোপর্দ করি।

Plate 26: Poster for raising awareness



Plate 27: Selling of frogs and toads in Bandarban Sadar Bazar



Plate 28: Turtles were sold in Shakhari Bazar, Dhaka



Plate 29: Rat Snake (*Ptyas mucosa*) was displayed in Bakterpur, Savar, Dhaka



Plate 30: Displaying Ornate Flying Snake (*Chrysopelea ornata*) in Bakterpur, Savar, Dhaka



Plate 31: Tokay Gecko (*Gekko gecko*) captured in Dhaka



Plate 32: Rat Snake (*Ptyas mucosa*) is showing in Bakterpur, Savar, Dhaka



Plate 33: Binocellate Cobra (*Naja naja*) is being displayed in Bakterpur, Savar, Dhaka



Plate 34: Monocellate Cobra (*Naja kaouthia*) was displayed in Bakterpur, Savar, Dhaka



Plate 35: Common Vine Snake (*Ahaetulla nasuta*) was shown to the customers in Bakterpur, Savar, Dhaka



Plate 36: Common Sand Boa (*Eryx conicus*) in the snake market shown to the customers in Bakterpur, Savar, Dhaka.



Plate 37: Indian Roofed Turtle (*Pangshura tecta*)
in a shop at Kataban, Dhaka



Plate 38: Turtle recovered at Shahjalal International Airport
while poaching



Plate 39: Black Headed Munia (*Lonchura Malacca*) in Kataban, Dhaka



Plate 40: Rose-ringed Parakeet (*Psittacula krameri*) in a shop at Kaptan Bazar, Dhaka



Plate 41: Spotted Dove (*Spilopelia chinensis*) in a shop at Kaptan Bazar in Dhaka



Plate 42: Blossom-headed Parakeet (*Psittacula roseate*) kept in a shop at Kataban, Dhaka



Plate 43: Red-breasted Parakeet (*Psittacula alexandri*) was sold on a street in Dhaka



Plate 44: Purple Swamphen (*Porphyrio porphyria*) captured in Gopalganj



Plate 45: Selling of Hill Myna (*Gracula religiosa*) in Chittagong



Plate 46: Five-striped Palm Squirrel (*Funambulus pennantii*) in a shop at Kaptan Bazar, Dhaka



Plate 47: Rhesus Monkey (*Macaca mulatta*)
recovered in Dhaka



Plate 48: Rufous-tailed Hare (*Lepus nigricollis*) in a shop at
Kataban, Dhaka



Plate 49: Irrewaddy Squirrel (*Callosciurus pygerythrus*) hunted by in Bandarban



Plate 50: Jungle Cat (*Felis chaus*) hunted in Netrokona



Plate 51: Fishing Cat (*Prionailurus viverrinus*) was hunted in Bagerhat



Plate 52: Jungle Cats (*Felis chaus*) are ready to burn by ethnic people in Naogaon



Plate 53: An animal hunter of an ethnic group in Naogaon district



Plate 54: Skin of Pangolin (*Manis crassicaudata*) recovered in Dhaka



Plate 55: Spotted Deer (*Axis axis*) skin recovered by Bagerhat district Police



Plate 56: Skins of Spotted Deer (*Axis axis*) were recovered by Rapid Action Battalion (RAB)



Plate 57: Trophy of different animals



Plate 58: Bengal Tiger (*Panthera tigris*) skin recovered by Bangladesh Forest Department



Plate 59: Turtle selling in Shakhari Bazar, Dhaka



Plate 60: Ethnic people burning Jungle Cat (*Felis chaus*) for food in Naogaon district



Plate 61: Rhesus Monkey (*Macaca mulatta*) used for the entertainment of the people in the street of Dhaka



Plate 62: Snake Charmers playing with snake in Bakterpur, Savar, Dhaka.



Plate 63: Binocete Cobra (*Naja naja*) is being displayed by a snake charmer in Bakterpur, Savar, Dhaka



Plate 64: Skins of Spotted Deer (*Axis axis*) were recovered by Bagerhat district Police



Plate 65: Bird selling at Dhaka University market, Kataban, Dhaka



Plate 66: Seller and buyer in a shop of Kaptan Bazar, Dhaka



Plate 67: Snake Charmers show snake to the buyer in Bakterpur, Savar, Dhaka



Plate 68: Turtle seller arrested in Dhaka by Police



Plate 69: Dealer arrested by RAB while transporting different species of snakes at Bosila housing in Dhaka



Plate 70: A street seller with Parakeets and Bayas in Dhaka



Plate 71: Spotted Dove in a local market of Khulna



Plate 72: A local so called medicine seller having trophy of different animals in Dhaka



Plate 73: Tools for hunting wildlife by local poachers in
Bagerhat

CHAPTER 4: SUMMARY AND CONCLUSION

4.1 SUMMARY

A study entitled, “Wildlife business in Bangladesh: its impacts on nature and conservation issues” was conducted from 2011 to 2014 under the following headings:

4.1.1 Wildlife business markets and spots

Twelve organized wildlife trade spots and 40 unorganized wildlife trade spots were noted during the study period covering eight districts of Bangladesh.

4.1.2 Illegal wildlife trade from 2011 to 2014

Seventy-four species of wildlife were recorded in the visited markets, most (57; 77.02%) of which were indigenous species. A substantial portion was threatened according to IUCN Red List (2015) in Bangladesh. A good number of exotic species were also recorded among 17,11,905 sold individuals. Most of the traded species were birds. A few numbers of trophies of different animals were found, on the contrary live wildlife were found most.

4.1.3 Trade value of wild animals

Over BDT 134 crore (one crore is 10,000,000) were observed to be transacted extensive part of which occurred against indigenous animals. Two species of amphibians, 15 species of reptiles, 26 species of birds and 14 species of mammals were found in the markets. Among these Bull Frog (*Hoplobatrachus tigerinus*), Spotted Flapshell Turtle (*Lissemys punctata*), Rat Snake (*Ptyas mucosa*), Black-headed Munia (*Lonchura malacca*), Hill Myna (*Gracula religiosa*) Five-striped Palm Squirrel (*Funambulus pennantii*) and Rhesus Monkey (*Macaca mulatta*) were remarkably sold.

The tribal and ethnic groups of people hunt the wild animals very frequently, especially for eating meat. Apart from them, traditional medicine sellers and poachers also capture different species for different purposes. Besides, there are many street sellers found in different areas of the country especially in Dhaka and Chittagong.

4.1.4 Trading of wildlife from 2011 to 2014

All groups of wildlife were seen to be traded throughout the study period. In 2011, birds and mammals were recorded as the highest sold animals among all groups but in 2012, amphibians and reptiles were the highest. In 2014, business of wildlife became reduced than in 2011 due to taking initiatives like frequent raid in wildlife markets in different regions by law enforcing agencies and creating alternative income sources.

4.1.5 Intention of wildlife trade

Wildlife are being captured and traded over the country due to food habit, entertainment, living, hobby, medicine, poaching, cross border transaction and other objectives. Different tribal people hunt animals for meat, organized traders capture them for poaching, hobby entertainment and so on. Moreover, there are few people who claim that they produce medicine using different body parts and extracts from animal in nature.

4.1.6 Sale of Indigenous wildlife

Animals which are lucrative to the customers, are highly traded in the markets. Aesthetic value and easy rearing make them highly demandable in the markets. Birds are considered as the highest value to the customers followed by mammals.

4.1.7 Wildlife traders

Both organized and unorganized traders are active in the field of wildlife trade. Organized traders have a muscular grip over the market controlled by a group of high status people in the society who never come to the scene. This sort of people are termed as „White Collar Criminal“.

4.1.8 Smuggling routes

The land of Bangladesh has been using a smuggling route of live wildlife for many decades. International commercial trade of wildlife and its parts and derivatives are estimated to be expanding, in both volume and value terms. The biodiversity is getting venturesome gradually due to the unsustainable use of wildlife. The commercial trading of live wild animals and trophies are amplifying in volume and monetary value day by day resulting environment incompatible.

4.1.9 Conservation

Conservation activities were carried out proactively among the groups who were living on dealing wildlife, students, teachers and law enforcers. This program included rehabilitation of snake charmers of Savar, awareness raising to the students, teachers and police officers. Operational activities were being performed by the Forest Department, Police, Rapid Action Battalion (RAB) and other stakeholders.

This study reveals that the combating wildlife business are facing challenges in investigation and judicial procedure. Weak co-ordination, absence of the application of technology obstructed investigation. Taking long time in judicial system impeded to get the fair play in conserving wildlife. Wildlife traffickers are trying to take advantages of perforated border lines.

Apart from the mentioned challenges, we know that there are huge demand of wildlife and their derivatives in the markets. Therefore, reducing demand in the market is also a big challenge. More conservation program may be operated on how we can make the people aware of the importance of wildlife in nature.

4.2 CONCLUSION

Wildlife business is one of the primary threats to a large number of species in a country like Bangladesh. Market demand is more on indigenous animals. Most of the wildlife are found in the markets are under Least Concern (LC) of IUCN category. All of the indigenous wildlife are captured directly from the nature. If the rate of trade would go likewise, the situation will be worst in near future. Most of the traders are not financially sound. Some of them have no alternative way but dealing with the business of wild animals. They need a different way of income so that they could give up wildlife trading. Rehabilitative initiative on snake charmers brought satisfactory feedback and kept them away of snake charming and business. Moreover, creating awareness among students have also a good outcome. Different operations by law enforcing agencies contribute to control wildlife business. To some extent, one of the most popular ways for business is using social media. Facebook and other networks are now very popular media for this business. The dealers still consider social media are secured for them. The cyber-crime division of Bangladesh Police is working on it. For combating wildlife trade, social media is yet to be controlled.

CHAPTER 5: RECOMMENDATIONS

The following recommendations have been suggested for combating illegal dealing of wildlife in Bangladesh-

1. Set up a disciplined police force- it may be called „Eco-Police“, as set up in Royal British Police Force, called NWCU (National Wildlife Crime Unit); in Indonesia- WCU (Wildlife Crime Unit) and in USA- wildlife officer from Police Officer;
2. WCCU (Wildlife Crime Control Unit) of the Forest Department should be expanded and trained up for more effective outcomes;
3. Rehabilitation of small and medium wildlife dealers for their livelihood as done for the snake charmers of Savar, Dhaka;
4. Creating awareness among mass people about the importance of wildlife and not buy or keep as pet;
5. Develop strong network among stakeholders in national and international levels and increase formal and informal communications among professionals, governmental officers, NGOs, iNGO and media;
6. Improve co-ordination within the law enforcing agencies;
7. Beefed-up security and scanning at border lines and ports. Enhance capacity, logistics and personnel;
8. Appoint focal point in every agency to apply the conservation law properly;
9. Maintain a criminal database and share it in national and international levels;
10. Maintain a gene bank of poached animals;
11. Create more breeding centers where different wildlife including threatened species could be kept under captivity nursing;
12. More sanctuaries should be declared to conserve the animals; and
13. Farms of turtle, snake, deer and other animal could be established on demand basis with due permission of The Bangladesh Forest Department (BFD).

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CHAPTER 7: APPENDICES

Appendix 1: Questionnaire

Questionnaire on Wildlife Business

Name : **Age** :
Educational Qualification : **Occupation** :

1. Do you know what Wildlife is?
Yes No
2. Do you know about Wildlife Business in Bangladesh?
Yes No
3. Do you know that the business of Wild animals is illegal?
Yes No
4. Do you know who are related in the field of wildlife Business in Bangladesh?
Yes No
5. Do you know that Wild animals are being poached?
Yes No
6. Do you know that Bangladesh is being used as a route of poaching Wild animals?
Yes No
7. Do you have any pet in your home?
Yes No
8. Do you keep Wildlife as pet?
Yes No
9. How many reasons do you know that the Wild animals are being sold other than as pet?
Please mention the reasons?
10. What do you know about the sources of Wildlife for trading?

11. What do you think, Is Wildlife beneficiary or harmful for nature?
Beneficiary Harmful
12. If Wildlife is harmful, then how they do harm?
13. Does anyone restrict ever for doing business with Wild animals?
Yes No
14. What do you think, is it necessary to stop Wildlife Business?
Yes No
15. If the Wildlife Business continues for long time, what impacts will be observed?
16. What do you think, is it necessary to stop Wildlife Business?
Yes No
17. Do you think that people should make aware for not to use Wildlife as pet? What role will you play?
18. Do you think that people of your surrounding should make aware of every related aspect of Wildlife trade?
Yes No
19. Do you think that people should be conscious about the importance of Wildlife in nature?
Yes No
20. What role would you like to play as a citizen to conserve Wildlife in your country?
21. Do you know how many Governmental Organizations and law enforcing agencies are responsible to fight with illegal Wildlife trade in Bangladesh? Please, mention the name.
22. Do you know about "Wildlife Crime Control Unit (WCCU)" under Bangladesh Forest Department?
Yes No
23. Do you know that you have access to provide information about Wildlife Business and Crime?
Yes No

24. Do you know about "The Wildlife (Conservation & Security) Act, 2012?"
Yes No
25. Do you know under this act, an offender who do Wildlife Business and Crime can be placed to the Court for punishment?
Yes No
26. Do you think that this subject is necessary to be included in National School Curriculum text book so that people of Bangladesh can know about the importance of Wildlife in nature from their early age?
Yes No
27. From now, whenever you will see the Wildlife are being traded anywhere, will you stop and inform the law enforcing agencies?
Yes No
28. Do you have any recommendations?

Appendix 2: Exotic species sold in the local markets according to group

Name of groups	Number of species	Number of individual (Total)	Rate of sale	Total Price (BDT)
Amphibians	00	00	0%	00
Reptiles	00	00	0%	00
Birds	13	5,23,000	85.27%	1,31,10,19,100
Mammals	04	90,347	14.73%	18,73,56,400
Total	17	6,13,347	100%	1,49,83,75,500

Appendix 3: List of wildlife found to sell in the local markets of Bangladesh

(a) Indigenous species: Amphibians

Amphibians								
Serial no.	Scientific name	Common name	Local name	Price per individual (BDT)	Number of specimens (Total)	Sold (%)	IUCN Status	
							Local	Global
1	<i>Hoplobatrachus tigerinus</i>	Bull Frog	Kola Bang	60	58132	84.29%	LC	LC
2	<i>Duttaphrynus melanostictus</i>	Common Toad	Kuno Bang	45	10837	15.71%	LC	LC

(b) Indigenous species: Reptiles

Reptiles								
Serial no.	Scientific name	Common name	Local name	Price per individual (BDT)	Number of specimens (Total)	Sold (%)	IUCN Status	
							Local	Global
1	<i>Pangshura tecta</i>	Indian Roofed Turtle	Kori Kaitta	200	8170	12.56	LC	VU
2	<i>Morenia petersi</i>	Yellow Turtle	Haldey Kaitta	240	9310	14.31	NT	EN
3	<i>Lissemys punctata</i>	Spotted Flapshell Turtle	Shundhi Kasim	400	13372	20.55	LC	VU
4	<i>Nilssonium hurum</i>	Peacock-marked softshell Turtle	Dhum Ksaim	450	4494	6.91	LC	EN
5	<i>Eryx conicus</i>	Common sand Boa	Balu Bora	800	320	0.49	DD	NT
6	<i>Eryx johnii</i>	Red sand Boa	--	900	190	0.29	--	NT
7	<i>Ahaetulla nasuta</i>	Common Vine Snake	Laodoga Shap	500	1143	1.76	LC	LC
8	<i>Ahaetulla prasina</i>	Short-nosed Vine Snake	Laodoga Shap	500	1056	1.62	LC	LC
9	<i>Amphiesma stolatum</i>	Stripped Keel back	Dora Shap	400	226	0.35	LC	LC
10	<i>Ptyas mucosa</i>	Rat Snake	Daraj Shap	700	8278	12.72	LC	LC
11	<i>Chrysopelea ornata</i>	Ornate flying Snake	Kalnagin i/ Uranta shap	2500	4360	6.70	LC	LC
12	<i>Naja kaouthia</i>	Monocellate Cobra	Gokra Shap/ Jati Shap/ Keauthia	1500	6270	9.64	NT	LC
13	<i>Naja naja</i>	Bionocellate Cobra	Khoia Gokhra/	1600	6506	10	NT	LC

(b) Indigenous species: Reptiles (Continued)

Reptiles								
Serial no.	Scientific name	Common name	Local name	Price per individual (BDT)	Number of specimens (Total)	Sold (%)	IUCN Status	
							Local	Global
14	<i>Python bivittatus</i>	Burmese Python	Ajagar	2800	45	0.07	DD	VU
15	<i>Gekko gekko</i>	Toaky Gecko	Tokkhak	150000	1319	2.03	LC	LC

(c) Indigenous species: Birds

Birds								
Serial no.	Scientific name	Common name	Local name	Price per individual (BDT)	Number of specimens (Total)	Sold (%)	IUCN Status	
							Local	Global
1	<i>Psittacula eupatria</i>	Alexandrian Parakeet	Chandana Tia	3500	5980	0.72	LC	NT
2	<i>Psittacula krameri</i>	Rose-ringed Parakeet	Tia	700	61656	7.41	LC	LC
3	<i>Psittacula alexandri</i>	Red-breasted Parakeet	Tota	1200	34969	4.20	LC	NT
4	<i>Psittacula roseate</i>	Blossom-headed Parakeet	Hiraman Tia	1500	39861	4.79	NT	NT
5	<i>Ploceus philippinus</i>	Baya weaver	Babui	160	105516	12.68	LC	LC
6	<i>Circaetus gallicus</i>	Short-toed Eagle	Sap Eagle	8000	1096	0.13	LC	LC

(c) Indigenous species: Birds (Continued)

Birds								
Serial no.	Scientific name	Common name	Local name	Price per individual (BDT)	Number of specimens (Total)	Sold (%)	IUCN Status	
								Global
7	<i>Gracula religiosa</i>	Hill Myna	Myna	11500	9585	1.15		LC
8	<i>Spilornis cheela</i>	Crested Serpent Eagle	Tila Eagle/Baj	5000	3190	0.38	LC	LC
9	<i>Haliastur indus</i>	Brahminy Kite	Shonko Chil	4500	4508	0.54	LC	LC
10	<i>Spilopelia chinensis</i>	Spotted Dove	Tila Ghughu	400	51840	6.23	NO	LC
11	<i>Chalcophaps indica</i>	Emerald Dove	Shabuj Ghughu	1500	2274	0.27	LC	LC
12	<i>Lonchura punctulata</i>	Scaly-breasted Munia	Tila Munia	170	183284	22.03		LC
13	<i>Lonchura Malacca</i>	Black Headed Munia	Kalo Matha Munia	170	187288	22.51		LC
14	<i>Passer domesticus</i>	House sparrow	Chorui	450	9600	1.15		LC
15	<i>Streptopelia orientalis</i>	Oriental Turtle Dove	Raj Ghughu	650	27516	3.31		LC
16	<i>Dendrocygna javanica</i>	Lesser Whistling Duck	Pati Shorali	700	33408	4.02		LC
17	<i>Gallicrex cinerea</i>	Watercock	Kora	1100	4872	0.59	LC	LC
18	<i>Porphyrio porphyrio</i>	Purple Swamp hen	Kalim	2500	20704	2.49		LC

(c) Indigenous species: Birds (Continued)

Birds								
Serial no.	Scientific name	Common name	Local name	Price per individual (BDT)	Number of specimens (Total)	Sold (%)	IUCN Status	
							Local	Global
19	<i>Tyto alba</i>	Barn Owl	Laxmi Pecha	3000	1389	0.17	LC	LC
20	<i>Acridotheres tristis</i>	Common Myna	Bhat Shalik	250	1944	0.23	LC	LC
21	<i>Sturnus contra</i>	Pied Myna	Gu Shalik	230	925	0.11	LC	LC
22	<i>Anthracoceros albirostris</i>	Oriental Pied Hornbill	Kao Dhanesh	7000	726	0.09	LC	LC
23	<i>Leptoptilos javanicus</i>	Lesser Adjutant	Modontak	9500	60	0.01	VU	NT
24	<i>Ardeola grayii</i>	Pond Heron	Kani Bok	450	32541	3.91	LC	LC
25	<i>Microcarbo niger</i>	Little Cormorant	Pankouri	650	4024	0.48	LC	LC
26	<i>Pycnonotus cafer</i>	Red-vented Bulbul	Kalo Bulbul	300	3250	0.39	LC	LC

(d) Indigenous species: Mammals

Mammals								
Serial no.	Scientific name	Common name	Local name	Price per individual (BDT)	Number of specimens (Total)	Sold (%)	IUCN Status	
							Local	Global
1	<i>Lepus nigricollis</i>	Rufous-tailed Hare	Khargosh	350	9075	6.85	EN	LC
2	<i>Manis crassicaudata</i>	Scaly anteater	Banrui	6000	9904	7.47	CR	EN
3	<i>Macaca mulatta</i>	Rhesus Monkey	Banor	7000	28931	21.83	VU	LC
4	<i>Herpestes auropunctatus</i>	Small Indian Mongoose	Beji	850	7136	5.38	LC	LC
5	<i>Funambulus pennantii</i>	Five-striped Palm Squirrel	Kathbiral	400	29049	21.92	LC	LC
6	<i>Paradoxurus hermaphroditus</i>	Common Palm Civet	Gandhogokul	5000	19027	14.36	LC	LC
7	<i>Viverra zibetha</i>	Large Indian Civet	Bagdash	5000	14456	10.91	NT	LC
8	<i>Viverricula indica</i>	Small Indian Civet	Khatas	5000	11410	8.61	NT	LC
9	<i>Platanista gangetica</i>	Gangetic Dolphin	Shushuk	8000	1329	1.00	VU	EN
10	<i>Panthera tigris</i>	Bengal Tiger	Bagh	2400000	8	0.01	CR	EN
11	<i>Axis axis</i>	Spotted deer	Chitra Horin	20000	237	0.18	LC	LC

(d) Indigenous species: Mammals (Continued)

Mammals								
Serial no.	Scientific name	Common name	Local name	Price per individual (BDT)	Number of specimens (Total)	Sold (%)	IUCN Status	
							Local	Global
12	<i>Callosciurus pygerythrus</i>	Irrawaddy Squirrel	Badami kathbirali	--	815	0.61	LC	LC
13	<i>Felis chaus</i>	Jungle Cat	Ban Biral	--	629	0.47	NT	LC
14	<i>Prionailurus viverrinus</i>	Fishing cat	Mecho Bagh	--	518	0.39	EN	VU

Appendix 4: Status of wildlife found to sell in the markets of Bangladesh**(a) Indigenous species: Amphibians**

Amphibians					
Serial no.	Scientific name	Common name	Local name	Number of specimens (Total)	CITES Status (Appendices)
1	<i>Hoplobatrachus tigerinus</i>	Bull Frog	Kola Bang	58132	II
2	<i>Duttaphrynus melanostictus</i>	Common Toad	Kuno Bang	10837	--

(b) Indigenous species: Reptiles

Reptiles					
Serial no.	Scientific name	Common name	Local name	Number of specimens (Total)	CITES Status (Appendices)
1	<i>Pangshura tecta</i>	Indian Roofed Turtle	Kori Kaitta	8170	I
2	<i>Morenia petersi</i>	Yellow Turtle	Haldey Kaitta	9310	--
3	<i>Lissemys punctata</i>	Spotted Flapshell Turtle	Shundhi Kasim	13372	--
4	<i>Nilssonina hurum</i>	Peacock-marked softshell Turtle	Dhum Ksaim	4494	I
5	<i>Eryx conicus</i>	Common sand Boa	Balu Bora	320	II
6	<i>Eryx johnii</i>	Red sand Boa	--	190	--
7	<i>Ahaetulla nasuta</i>	Common Vine Snake	Laodoga Shap	1143	--
8	<i>Ahaetulla prasina</i>	Short-nosed Vine Snake	Laodoga Shap	1056	--
9	<i>Amphiesma stolatum</i>	Stripped Keel back	Dora Shap	226	III

(b) Indigenous species: Reptiles (Continued)

Reptiles					
Serial no.	Scientific name	Common name	Local name	Number of specimens (Total)	CITES Status (Appendices)
10	<i>Ptyas mucosa</i>	Rat Snake	Daraj Shap	8278	II
11	<i>Chrysopelea ornata</i>	Ornate flying Snake	Kalnagini/ Uranta Shap	4360	--
12	<i>Naja kaouthia</i>	Monocellate Cobra	Gokhra Shap/ Jati Shap/	6270	II
13	<i>Naja naja</i>	Bionocellate Cobra	Khoia Gokhra/	6506	II
14	<i>Python bivittatus</i>	Burmese Python	Ajagar	45	II
15	<i>Gekko gecko</i>	Tokay Gecko	Tokkhak	1319	--

(c) Indigenous species: Birds

Birds					
Serial no.	Scientific name	Common name	Local name	Number of specimens (Total)	CITES Status (Appendices)
1	<i>Psittacula eupatria</i>	Alexandrian Parakeet	Chandana Tia	5980	II
2	<i>Psittacula krameri</i>	Rose ringed Parakeet	Tia	61656	--
3	<i>Psittacula alexandri</i>	Red Breasted Parakeet	Tota	34969	II
4	<i>Psittacula roseata</i>	Bloosom Headed Parakeet	Hiraman Tia	39861	II
5	<i>Ploceus philippinus</i>	Baya weaver	Babui	105516	--
6	<i>Circaetus gallicus</i>	Short toed Eagle	Sap Eagle	1096	--
7	<i>Gracula religiosa</i>	Hill Myna	Myna	9585	II
8	<i>Spilornis cheela</i>	Crested Serpent Eagle	Tila Eagle/Baj	3190	--
9	<i>Haliastur indus</i>	Brahminy Kite	Shonko Chil	4508	--
10	<i>Spilopelia chinensis</i>	Spotted Dove	Tila Ghughu	51840	--
11	<i>Chalcophaps indica</i>	Emerald Dove	Shabuj Ghughu	2274	--
12	<i>Lonchura punctulata</i>	Scaly-breasted Munia	Tila Munia	183284	--
13	<i>Lonchura Malacca</i>	Black Headed Munia	Kalo Matha Munia	187288	--
14	<i>Passer domesticus</i>	House sparrow	Chorui	9600	--
15	<i>Streptopelia orientalis</i>	Oriental Turtle Dove	Raj Ghughu	27516	--
16	<i>Streptopelia decaocta</i>	Urasian Coller Dove	Coller Dove	33408	--
17	<i>Gallicrex cinerea</i>	Watercock	Kora	4872	--

(c) Indigenous species: Birds (Continued)

Birds (Contd.)					
Serial no.	Scientific name	Common name	Local name	Number of specimens (Total)	CITES Status (Appendices)
18	<i>Porphyrio porphyrio</i>	Purple Swamphe	Kalim	20704	--
19	<i>Tyto alba</i>	Barn Owl	Laxmi Pecha	1389	II
20	<i>Acridotheres tristis</i>	Common Myna	Bhat Shalik	1944	--
21	<i>Sturnus contra</i>	Pied Myna	Gu Shalik	925	--
22	<i>Anthracoceros albirostris</i>	Oriental Pied Hornbill	Kao Dhanesh	726	II
23	<i>Leptoptilos javanicus</i>	Lesser Adjutant	Modontak	60	--
24	<i>Ardeola grayii</i>	Pond Heron	Kani Bok	32541	--
25	<i>Microcarbo niger</i>	Little Cormorant	Pankouri	4024	--
26	<i>Pycnonotus cafer</i>	Red-vented Bulbul	Kalo Bulbul	3250	--

(d) Indigenous species: Mammals

Mammals					
Serial no.	Scientific name	Common name	Local name	Number of specimens (Total)	CITES Status (Appendices)
1	<i>Lepus nigricollis</i>	Rufous-tailed Hare	Khargosh	9075	--
2	<i>Manis crassicaudata</i>	Indian Pangolin	Banrui	9904	II
3	<i>Macaca mulatta</i>	Rhesus Monkey	Banor	28931	II
4	<i>Herpestes auropunctatus</i>	Small Indian Mongoose	Beji	7136	--
5	<i>Funambulus pennantii</i>	Five-striped Palm Squirrel	Kathbirali	29049	--
6	<i>Paradoxurus hermaphroditus</i>	Common Palm Civet	Gandhogokul	19027	III
7	<i>Viverra zibetha</i>	Large Indian Civet	Bagdash	14456	III
8	<i>Viverricula indica</i>	Small Indian Civet	Khatas	11410	III
9	<i>Platanista gangetica</i>	Gangetic Dolphin	Shushuk	1329	I

(d) Indigenous species: Mammals (Continued)

Mammals					
Serial no.	Scientific name	Common name	Local name	Number of specimens (Total)	CITES Status (Appendices)
10	<i>Panthera tigris</i>	Bengal Tiger	Bagh	8	I
11	<i>Axis axis</i>	Spotted deer	Chitra Horin	237	--
12	<i>Callosciurus pygerythrus</i>	Irrawaddy Squirrel	Badamikathbirali	815	--
13	<i>Felis chaus</i>	Jungle Cat	Ban Biral	629	II
14	<i>Prionailurus viverrinus</i>	Fishing cat	Mecho Bagh	518	II

Appendix 5: Sold Indigenous wildlife in the local markets

Name of Groups	Number of Individuals	Rate of sale
Amphibians	68969	6.28%
Reptiles	65059	5.92%
Birds	832006	75.74%
Mammals	132524	12.06%
Total	10,98,558	100%

Appendix 6: Number of threatened traded wildlife sold in the local markets

Group of animal	Number of Species	Number of Specimen
Amphibians	00	00
Reptiles	10	55097
Birds	05	32342
Mammals	10	95287
Total	25	182726

Appendix 7: Trophies of Indigenous wildlife

Name of Groups	Number of Individuals
Amphibians	0
Reptiles	23
Birds	0
Mammals	7745

Appendix 8: Purpose of trading indigenous wildlife

Name of Groups	Causes of trade					
	Food	Entertainment/ Living	Hobby	Poaching	Medicine	Total
Amphibians	68969	0	0	0	0	68969
Reptiles	35346	28349	0	1364	0	65059
Birds	32541	0	788490	10249	726	832006
Mammals	1681	36585	38124	08	56126	132524
Total	138537	64934	826614	11621	56852	1098558

Appendix 9: Price of animals found to sell in the markets of Bangladesh**(a) Indigenous species: Amphibians**

Amphibians														
Ser ial no.	Scientific name	Com mon nam e	Loc al nam e	Price per individu al (BDT)	Number of specimens				Price per year (BDT)				Number of specime ns (Total)	Price (Cumulati ve)
					2011	2012	2013	2014	2011	2012	2013	2014		
1	<i>Hoplobatrachus tigerinus</i>	Bull Frog	Kola Ban g	60	14784	15968	15238	12142	887040	958080	914280	728520	5813 2	3487920
2	<i>Duttaphryns melanostictus</i>	Com mon Toad	Kun o Ban g	45	2762	2996	2950	2129	124290	134820	132750	95805	1083 7	487665

(b) Indigenous species: Reptiles

Reptiles														
Serial no.	Scientific name	Common name	Local name	Price per individual (BDT)	Number of specimens				Price per year (BDT)				Number of specimen (Total)	Price (Cumulative)
					2011	2012	2013	2014	2011	2012	2013	2014		
1	<i>Pangshura tecta</i>	Indian Roofed Turtle	Kori Kaitta	200	2417	2201	2067	1485	483400	440200	413400	297000	8170	1634000
2	<i>Morenia petersi</i>	Yellow Turtle	Haldey Kaitta	240	2758	2510	2209	1833	661920	602400	530160	439920	9310	2234400
3	<i>Lissemys punctata</i>	Spotted Flapshell Turtle	Shundhi Kasim	400	3961	3605	3185	2621	1584400	1442000	1274000	1048400	13372	5348800
4	<i>Nilssonia hurum</i>	Peacock-marked softshell Turtle	Dhum Ksaim	450	1331	1211	1120	832	598950	544950	504000	374400	4494	2022300
5	<i>Eryx conicus</i>	Common sand Boa	Balu Bora	800	95	86	68	71	76000	68800	54400	56800	320	256000
6	<i>Eryx johnii</i>	Red sand Boa	-	900	58	52	46	34	52200	46800	41400	30600	190	171000
7	<i>Ahaetulla nasuta</i>	Common Vine Snake	Laodoga Shap	500	337	308	287	211	168500	154000	143500	105500	1143	571500
8	<i>Ahaetulla prasina</i>	Short-nosed Vine Snake	Laodoga Shap	500	315	286	243	212	157500	143000	121500	106000	1056	528000
9	<i>Amphiesma stolatum</i>	Stripped Keel back	Dora Shap	400	66	60	52	48	26400	24000	20800	19200	226	90400

(b) Indigenous species: Reptiles (Continued)

Reptiles (Contd.)														
Serial no.	Scientific name	Common name	Local name	Price per individual (BDT)	Number of specimens				Price per year (BDT)				Number of specimen (Total)	Price (Cumulative)
					2011	2012	2013	2014	2011	2012	2013	2014		
10	<i>Ptyas mucosa</i>	Rat Snake	Daraj Shap	700	2699	2039	2060	1480	1889300	1427300	1442000	1036000	8278	5794600
11	<i>Chrysopelea ornata</i>	Ornate flying Snake	Kalnagini/ Uranta shap	2500	1392	1276	1041	651	3480000	3190000	2602500	1627500	4360	10900000
12	<i>Naja kaouthia</i>	Monocellate Cobra	Gokhra Shap/ JatiShap/ Keauthia	1500	1856	1689	1510	1215	2784000	2533500	2265000	1822500	6270	9405000
13	<i>Naja naja</i>	Bionocellate Cobra	Khoia Gokhra/	1600	1925	1753	1605	1223	3080000	2804800	2568000	1956800	6506	10409600
14	<i>Python molurus</i>	Burmese Python	Ajagar	2800	17	13	9	6	47600	36400	25200	16800	45	126000
15	<i>Gekko gekko</i>	Tokay Gecko	Tokkhak	150000	390	355	285	289	58500000	53250000	42750000	43350000	1319	197850000

(c) Indigenous species: Birds

Birds														
Serial no.	Scientific name	Common name	Local name	Price per individual (BDT)	Number of specimens				Price per year (BDT)				Number of specimen (Total)	Price (Cumulative)
					2011	2012	2013	2014	2011	2012	2013	2014		
1	<i>Psittacula eupatria</i>	Alexandrian Parakeet	Chandana Tia	3500	1842	1655	1493	990	6447000	5792500	5225500	3465000	5980	20930000
2	<i>Psittacula krameri</i>	Rose ringed Parakeet	Tia	700	19021	17082	15276	10277	13314700	11957400	10693200	7193900	61656	43159200
3	<i>Psittacula alexandri</i>	Red Breasted Parakeet	Tota	1200	10787	9687	8963	5532	12944400	11624400	10755600	6638400	34969	41962800
4	<i>Psittacula roseata</i>	Blossom Headed Parakeet	Hiraman Tia	1500	12299	11045	9934	6583	18448500	16567500	14901000	9874500	39861	59791500
5	<i>Ploceus philippinus</i>	Baya weaver	Babui	160	32552	29233	25009	18722	5208320	4677280	4001440	2995520	105516	16882560
6	<i>Circaetus gallicus</i>	Short toed Eagle	-	8000	354	389	95	258	2832000	3112000	760000	2064000	1096	8768000
7	<i>Gracula religiosa</i>	Hill Myna	Myna	9800	2958	2654	2264	1709	28988400	26009200	22187200	16748200	9585	93933000
8	<i>Spilornis cheela</i>	Crested Serpent Eagle	TilaBaj	5000	985	883	785	537	4925000	4415000	3925000	2685000	3190	15950000
9	<i>Haliastur indus</i>	Brahminy Kite	Shonko Chil	4500	1393	1248	970	897	6268500	5616000	4365000	4036500	4508	20286000

(c) Indigenous species: Birds (Continued)

Birds (Contd.)														
Serial no.	Scientific name	Common name	Local name	Price per individual (BDT)	Number of specimens				Price per year (BDT)				Number of specimen (Total)	Price (Cumulative)
					2011	2012	2013	2014	2011	2012	2013	2014		
10	<i>Spilopelia chinensis</i>	Spotted Dove	Tila Ghughu	750	15997	14362	13162	8319	11997750	10771500	9871500	6239250	51840	38880000
11	<i>Chalcophaps indica</i>	Emerald Dove	Shabuj Ghughu	2500	736	663	581	294	1840000	1657500	1452500	735000	2274	5685000
12	<i>Lonchura punctulata</i>	Scaly-breasted Munia	Tila Munia	170	56549	50779	36489	39467	9613330	8632430	6203130	6709390	183284	31158280
13	<i>Lonchura Malacca</i>	Black Headed Munia	Kalo Matha Munia	170	57786	51891	37284	40327	9823620	8821470	6338280	6855590	187288	31838960
14	<i>Passer domesticus</i>	House sparrow	Chorui	450	2961	2658	2368	1613	1332450	1196100	1065600	725850	9600	4320000
15	<i>Streptopelia orientalis</i>	Oriental Turtle Dove	Raj Ghughu	650	8489	7621	5926	5480	5517850	4953650	3851900	3562000	27516	17885400
16	<i>Streptopelia decaocta</i>	Urasian Coller Dove	Coller Dove	700	10041	10084	7928	5355	7028700	7058800	5549600	3748500	33408	23385600
17	<i>Gallicrex cinerea</i>	Watercock	Kora	1100	1735	1583	1205	349	1908500	1741300	1325500	383900	4872	5359200
18	<i>Porphyrio porphyrio</i>	Purple Swamphe n	Kalim	2500	6387	5934	4559	3824	15967500	14835000	11397500	9560000	20704	51760000
19	<i>Tyto alba</i>	Barn Owl	Laxmi Pecha	3000	431	405	348	205	1293000	1215000	1044000	615000	1389	4167000
20	<i>Acridotheres tristis</i>	Common Myna	Bhat Shalik	250	603	559	457	325	150750	139750	114250	81250	1944	486000

(c) Indigenous species: Birds (Continued)

Birds (Contd.)														
Serial no.	Scientific name	Common name	Local name	Price per individual (BDT)	Number of specimens				Price per year (BDT)				Number of specimen (Total)	Price (Cumulative)
					2011	2012	2013	2014	2011	2012	2013	2014		
21	<i>Sturnus contra</i>	Pied Myna	Gu Shalik	230	285	254	200	186	65550	58420	46000	42780	925	212750
22	<i>Anthracoeros albirostris</i>	Oriental Pied Hornbill	Kao Dhanesh	7000	247	213	164	102	1729000	1491000	1148000	714000	726	5082000
23	<i>Leptoptilos javanicus</i>	Lesser Adjutant	Modontak	9500	24	19	12	5	228000	180500	114000	47500	60	570000
24	<i>Ardeola grayii</i>	Pond Heron	Kani Bok	320	10040	9015	7007	6479	3212800	2884800	2242240	2073280	32541	10413120
25	<i>Microcarbo niger</i>	Little Cormorant	Pankouri	650	1244	1116	799	865	808600	725400	519350	562250	4024	2615600
26	<i>Pycnonotus cafer</i>	Red-vented Bulbul	Kalo Bulbul	300	968	864	758	660	290400	259200	227400	198000	3250	975000

(d) Indigenous species: Mammals

Mammals														
Serial no.	Scientific name	Common name	Local name	Price per individual (BDT)	Number of specimens				Price per year (BDT)				Number of specimens (Total)	Price (Cumulative)
					2011	2012	2013	2014	2011	2012	2013	2014		
1	<i>Lepus nigricollis</i>	Rufous-tailed Hare	Khargosh	350	3007	2561	2039	1468	1052450	896350	713650	513800	9075	3176250
2	<i>Manis crassicaudata</i>	Indian Pangolin	Banrui	6000	3373	2665	2216	1650	20238000	15990000	13296000	9900000	9904	59424000
3	<i>Macaca mulatta</i>	Rhesus Monkey	Banor	7000	9560	7200	6183	5988	66920000	50400000	43281000	41916000	28931	202517000
4	<i>Herpestes auropunctatus</i>	Small Indian Mongoose	Beji	850	2360	1776	1476	1524	2006000	1509600	1254600	1295400	7136	6065600
5	<i>Funambulus pennantii</i>	Five-striped Palm Squirrel	Kathbirali	400	9600	7226	6207	6016	3840000	2890400	2482800	2406400	29049	11619600
6	<i>Paradoxurus hermaphroditus</i>	Common Palm Civet	Gandhogokul	5000	6289	4735	4066	3937	31445000	23675000	20330000	19685000	19027	95135000

(d) Indigenous species: Mammals (Continued)

Mammals														
Serial no.	Scientific name	Common name	Local name	Price per individual (BDT)	Number of specimens				Price per year (BDT)				Number of specimens (Total)	Price (Cumulative)
					2011	2012	2013	2014	2011	2012	2013	2014		
7	<i>Viverra zibetha</i>	Large Indian Civet	Bagdash	5000	4783	3597	3086	2990	23915000	17985000	15430000	14950000	14456	72280000
8	<i>Viverricula indica</i>	Small Indian Civet	Khatas	5000	3775	2839	2437	2359	18875000	14195000	12185000	11795000	11410	57050000
9	<i>Platanista gangetica</i>	Gangetic Dolphin	Shushuk	8000	469	356	284	220	3752000	2848000	2272000	1760000	1329	10632000
10	<i>Panthera tigris</i>	Bengal Tiger	Bagh	2400000	1	2	3	2	2400000	4800000	7200000	4800000	8	19200000
11	<i>Axis axis</i>	Spotted deer	Chitra Horin	20000	79	62	47	49	1580000	1240000	940000	980000	237	4740000
12	<i>Callosciurus pygerythrus</i>	Irrawaddy Squirrel	Badami kathbirali	-	265	203	176	171	-	-	-	-	815	-
13	<i>Felis chaus</i>	Jungle Cat	Ban Biral	-	230	156	134	109	-	-	-	-	629	-
14	<i>Prionailurus viverrinus</i>	Fishing cat	Mecho Bagh	-	174	129	109	106	-	-	-	-	518	-

(e) Exotic species: Birds

Birds						
Serial no.	Scientific name	Common name	Local name	Price per individual (BDT)	Number of specimens	Total Price
1	<i>Meleagris gallopavo</i>	Common Turkey	Turkey	30000	4,448	133440000
2	<i>Numida meleagris</i>	Helmeted Guinea Fowl	Titir	3100	18,116	56159600
3	<i>Padda oryzivora</i>	Java Finch	Java	1800	21,942	39495600
4	<i>Agapornis roseicollis</i>	Rosy-faced love bird	Love Bird	1400	61,700	86380000
5	<i>Cacatua galerita</i>	Sulpher-crested Cockatoo	Kakatua	6200	14,688	91065600
6	<i>Nymphicus hollandicus</i>	Cockatiel	Cockatel	2150	80,572	173229800
7	<i>Taeniopygia guttata</i>	Zebra Finch	Prince	550	1,03,049	56676950
8	<i>Melopsittacus undulates</i>	Budgerigar	Bajrika	450	1,49,857	67435650
9	<i>Geopelia cuneata</i>	Diamond Dove	Shada Ghughu	700	19,192	13434400
10	<i>Columba livia</i>	Pigeon	Kabutor	8000	47,344	378752000

(e) Exotic species: Birds (Continued)

Birds						
Serial no.	Scientific name	Common name	Local name	Price per individual (BDT)	Number of specimens	Total Price
11	<i>Amazona ochrocephala</i>	Yellow-crowned Parakeet	Macaw	100500	943	94771500
12	<i>Serinus Camaria</i>	American Singer Canary Bird	Canary Bird	105000	682	71610000
13	<i>Aratinga acuticaudata</i>	Blue-crowned Conure Stats		104000	467	48568000

(e) Exotic species: Mammals

Mammals						
Serial no.	Scientific name	Common name	Local name	Price per individual (BDT)	Number of specimens	Total Price
1	<i>Canis familiaris</i>	German Shepherd Dog	Shepherd Dog	40000	1,956	78240000
2	--	White Dog	White Dog	10000	3,472	34720000
3	<i>Oryctolagus cuniculus</i>	Rabbit	Khorgosh	1200	50,536	60643200
4	<i>Cavia porcellus</i>	Guinea Pig	Ginipig	400	34,383	13753200

Appendix 10: Price of indigenous species according to group of wildlife

Sl. no.	Group of Animal	Price per Year (BDT)				
		2011	2012	2013	2014	Total
1	Amphibians	10,11,330	10,92,900	10,47,030	8,24,325	39,75,585
2	Reptiles	7,35,90,170	6,67,08,150	5,47,55,860	5,22,87,420	24,73,41,600
3	Birds	17,21,84,620	15,63,93,100	12,93,24,690	9,85,54,560	55,64,56,970
4	Mammals	17,60,23,450	13,64,29,350	11,93,85,050	11,00,01,600	54,18,39,450
Total		42,28,09,570	36,06,23,500	30,45,12,630	26,16,67,905	1,34,96,13,605

Appendix 11: Exotic species according to group

Serial No.	Group of Animal	Number of species	Number of individual (Total)	Total Price (BDT)
1	Amphibians	00	00	00
2	Reptiles	00	00	00
3	Birds	13	5,23,000	1,31,10,19,100
4	Mammals	04	90,347	18,73,56,400
Total		17	6,13,347	1,49,83,75,500