**Government of the People's Republic of Bangladesh**
**Ministry of**
**Housing and Public Works Urban Development Directorate**

# 2nd Season Field Survey Report on
# an Inventory of Existing flora and Fauna

**Project title:**

**FLORA AND FAUNA SURVEY UNDER "PREPARATION OF DEVELOPMENT PLAN FOR MEHERPUR DISTRICT**

**Date: May, 2025**


**ENGINEERING CONSULTANTS & ASSOCIATES LTD.**

154, Monipuripara, Farmgate, Tejgaon, Dhaka-1215.
Phone: 8116214, 9110176, 9111277 Email: ecalimited@yahoo.com; ecalimitedbd@gmail.com

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# 1. Introduction

## 1.1 Project Background

Bangladesh is not only the world's fastest-growing populous country, but also a country with immense potential in the near future. As the world's population grows, so does urbanization. Without suitable standards, it is difficult to manage the developing urban areas as a result of urbanization. Urbanization includes the expansion of houses and other infrastructure. Nobody can deny that the housing and infrastructure situation in metropolitan areas is deteriorating day by day. It must be arranged in order to be properly guided. Meanwhile, the honorable Prime Minister issued significant instructions for the country's spatial and sectoral planning at different levels. Bangladesh is one of the world's most densely populated countries, and it has had tremendous population increase over the last century, however the rate of growth has recently slowed to a reasonable level. Over the next decade, the country will see a rapid development of urbanization. According to an estimate, by 2020, nearly every other man, woman and child will live in an urban area (World Bank ed., Bangladesh 2020). Bangladesh's urban population has been growing at a yearly average rate of 6 percent since independence, at a time when the national population growth was 2.2 percent. As a result, urban population has grown six-fold, compared with a 70 percent increase in rural population (World Bank, 2007). As per recent UN data, approximately 25 percent of Bangladesh's current population currently lives in urban areas. Of this urban population, more than half lives in the four largest cities: Dhaka, Chittagong, Khulna and Rajshahi.

Urbanization refers to the increase in the number of people living in urban areas such as towns and cities. In the course of urbanization, urban expansion is unavoidable. People in Bangladesh are increasingly preferring to reside in and around cities and towns in recent years. People in our country primarily migrate from rural to cities in pursuit of a variety of opportunities. Urbanization, on the other hand, is frequently used as an indicator of development. Unplanned urbanization, on the other hand, poses a hazard to developing countries like Bangladesh. Bangladesh's urbanization has recently been complicated by a number of new issues. Such growing difficulties, as well as their impact, can be mitigated with proper planning and actions. Bangladesh would undoubtedly attain its targeted sustainable urban growth goal through planned urbanization. In 2008, humankind has crossed a socio-demographic milestone for the first time in history by having half of its population living within the urban areas (UNFPA, 2007).

In developing countries, urbanization has now become a powerful force. Cities are important drivers of growth and development, providing jobs, infrastructure, and services. With the unplanned expansion, the growing number of people, assets, and economic activities increase the exposure of cities to the impacts of disasters and climate change. However, in low and lower-middle income countries, new urban development is increasingly more likely to occur on hazard-prone land, namely in floodplains and other low-lying areas, along fault lines, and on steep slopes. In addition to settling in hazard-prone areas, much of the building construction that occurs is unregulated and unplanned, placing vulnerable populations, who settle on hazard-prone land, at increased risk. Besides, poor urban governance, declining ecosystems, and vulnerable rural livelihoods are among the main underlying risk drivers, which need to be addressed to build safer cities. Bangladesh has been experiencing a rapid increase in its urban population ever since its independence in 1971.Urban population as a percentage of total population increased from around 8.8% to nearly 23% during the 1974-2011 periods. It is estimated that by the year 2021 nearly one-third or 33% of the population of Bangladesh will be living in urban areas. More than 60% of the national GDP is derived from non-agricultural sectors that are mainly based in urban areas. This phenomenon indicates the increasing role of urban areas being played in the national economy.

Upazila Parishad is the lowest administrative level of local government in Bangladesh. The majority of Upazila Parishads are still unable to achieve planned rural-urban development, which involves physically

and socioeconomically integrating rural and urban areas. Most of the time, land is used haphazardly, resulting in a low level of living for the population. In the present government's policy for administrative reorganization, the upazila is the most important tier of administration. In light of the foregoing, a comprehensive development plan is required to handle the mandatory land use transition in both urban and rural areas, while avoiding unauthorized and unplanned development. A comprehensive development strategy at the Upazila level appears to be necessary.

Urban Development Directorate under the Ministry of Housing and Public Works, has launched a project titled "Preparation of Development Plan for Meherpur Zilla Project". This initiative aims to formulate a development plan for the next 20 years, divided into essential sectors to create a risk-sensitive and sustainable strategy. To understand the socio-economic and demographic profile of the study area is pivotal step for understanding the immediate needs and forecast the future needs for the next 20 years. Existing data and features are instrumental in providing a clear spatial understanding of the project area, accurately reflecting the potentials and problems of the existing scoria economic related conditions, and facilitating the representation within the development plan. Overall, the scope of socio-economic project signifies a comprehensive and forward-looking approach to urban development, emphasizing sustainability and thoughtful planning over the next two decades.

**Existing Flora and Fauna survey** is one of the important development modules of this project. In this development plan, existing Floral and Faunal information is considered as an important tool for a durable and sustainable urbanization. Land use planning is an important component for a modern urban development. But practicing urban development using a proper land use plan is not developed in Bangladesh. Prior to land use planning it is very essential to access existing Flora and Fauna conditions and the relevant information in and around the site of future urban development. Therefore, a rigorous Flora and Fauna study is needed to carry out for a resilient urban development.

## 1.2 Description of the Study Area

**Meherpur Zilla,** located in the southwestern part of Bangladesh, holds a significant place in the country's history and culture. Known for its rich heritage and pivotal role in the liberation war, Meherpur continues to thrive with its diverse economy, agricultural abundance, and growing infrastructure. This proposal aims to highlight the key aspects of Meherpur Zilla, focusing on its socio-economic landscape, cultural heritage, and potential for future development. The district comprises three Upazilas: Meherpur Sadar, Mujibnagar, and Gangni. Meherpur Sadar serves as the administrative and economic hub, with a diverse economy primarily based on agriculture and trade. Mujibnagar, formerly Bhoborpara, is renowned for its historical importance in the Liberation War, attracting many tourists to its memorial complex. Gangni Upazila is notable for its vibrant agricultural activities and emerging industrial potential. Collectively, these Upazilas contribute to the district's cultural richness, economic diversity, and historical legacy, positioning Meherpur Zilla as a region of significant importance and development potential in Bangladesh.

Meherpur Zilla is bordered by Kushtia to the east, Chuadanga to the south, and the Indian state of West Bengal to the west and north, situated in the Khulna Division. The district's strategic location offers significant advantages for cross-border trade and cultural exchange. The district is predominantly rural, with a diverse population comprising various ethnic and religious communities. The literacy rate is gradually improving, with ongoing efforts to enhance educational facilities and opportunities.

**a) Gangni Upazila**

Gangni Upazila (Meherpur district) area 363.95 sq km, located in between 23°44' and 23°52' North latitudes and in between 88°34' and 88°47' East longitudes. It is bounded by Daulatpur (Kushtia) upazila on the North, Alamdanga and Meherpur Sadar upazilas on the South, Daulatpur (Kushtia),

Mirpur (Kushtia) and' Alamdanga upazilas on the East, Meherpur Sadar upazila and West Bengal state of India on the West.

Population Total 299607; male 148250, female 151357; Muslim 295458, Hindu 2726, Christian 1313 and others 110. Water bodies Main rivers: Bhairab, Ichamati, Mathabhanga and Kazla; Elangi Beel, Nuner Beel and Elalgari Damash Beel are notable. Administration Gangni Thana was formed in 1923 and it was turned into an upazila on 24 February 1984.' Gangni Upazila consist of one Municipality, 9 Unions, 90 Mouzas and 137 Villages.


Bamundi Union, Gangni Upazila

**b) Meherpur Sadar Upazila**

Meherpur Sadar Upazila (Meherpur district) area 276.15 sq km, located in between 23°40' and 23°52' North latitudes and in between 88°34' and 88°47' East longitudes. It is bounded by Gangni upazila and West Bengal state of India on the North, Damurhuda and Mujibnagar upazilas on the South, Gangni and Alamdanga upazilas on the East, West Bengal state of India on the West.

Population Total 256642; male 127300, female 129342; Muslim 252323, Hindu 4199, Buddhist 1, Christian 114 and others 5. Water bodies Main rivers: Bhairab, Kazla; Bhatgari and Chand Beels are notable. Administration Meherpur Thana was turned into an upazila in 1984. Meherpur Municipality was formed in 1960. Meherpur Sadar consist of one Municipality, 5 Unions, 61 Mouzas and 104 Villages.


Kutubpur beel, Kutubpur Union, Maherpur Sadar Upazila

**c) Mujibnagar Upazila**

Mujibnagar Upazila (Meherpur district) area 111.51 sq km, located in between 23°36' and 23°45' North latitudes and in between 88°34' and 88°43' East longitudes. It is bounded by Meherpur Sadar upazila on the North, Damurhuda and Meherpur Sadar upazilas on the East, West Bengal of India on the South and on the West.

Population Total 99143; male 49084, female 50059; Muslim 92970, Hindu 945, Buddhist 13, Christian 5200 and others 15. Water bodies Bhairab River, Sarashati Canal and Datpur Beel are notable. Administration Mujibnagar upazila was formed on 24 February 2000. Mujibnagar Upazila consist of 4 Unions, 29 Mouza and 33 Villages.

Dariapur beel, Dariapur Union, Mujibnagar Upazila

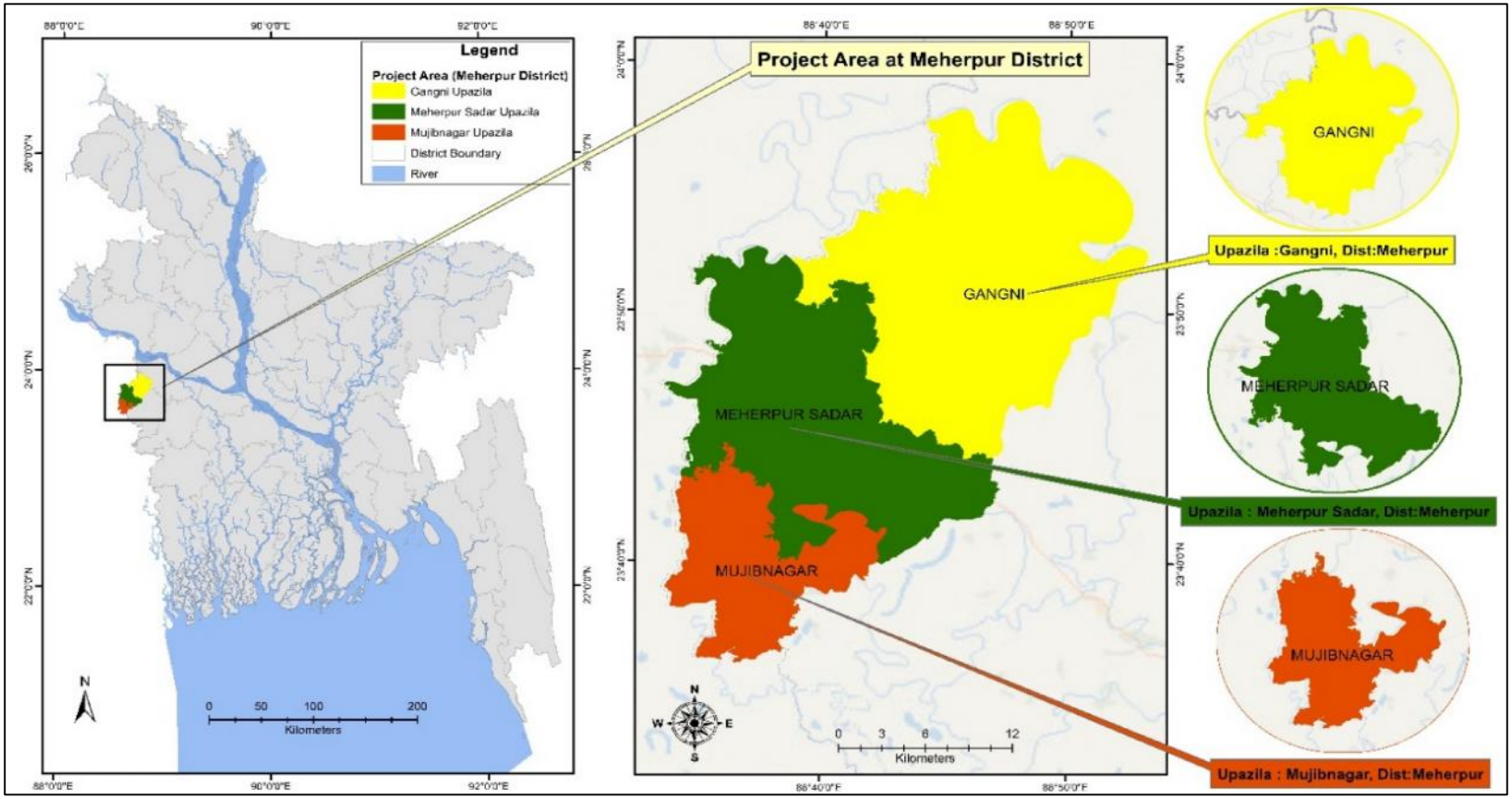



**Figure 1-1: Location map of project area of Meherpur District.**

## 1.3 Aims and Objectives

The baseline survey of existing flora and fauna will be conducted in project area of 3 upazilas of Meharpure district; i) Meherpur Sadar upazila, ii) Mujibnagar Upazila, and iii) Gangni Upazila.

**Objectives:**

***Main objectives of the project:***

The objective of the project is to optimize resources and activities for sustenance of marginal people. The urban and rural activities and resources are very important to the economy and life of the people of Bangladesh whose living conditions are inextricably linked to the productivity and sustainability of land use. There is no long-term Holistic Development Plan for the rural and urban area but it needs to be integrated with the mainstream of development process of the country. So, an interdisciplinary development planning approach is urgent to optimize livelihood of the project area.

***Specific objectives of present study as per scope of work:***

Baseline survey of existing flora and fauna in different place of the study area will be conducted to attain the following objectives:

- To develop an understanding of the existing flora and fauna based on available information, data gathering, literature searches, site visits and any baseline studies already carried out;
- To make an inventory of the species that are present on the spatial level of the survey and also the species that are frequent and also which are rare
- To identify the autecological characteristics, they possess and the communities they form
- To identify the characteristics and physical conditions of the sites that form their habitats
- To explore Historical aspects of habitats and biodiversity in the area
- To determine Underlying process of habitats dynamism — char formation, afforestation, forest clearing, settlements, growth centers, dykes, land reclamation, drainage system improvement, etc.
- To determine a threshold for selecting existing flora and fauna, based on their value, using measures;
- To identify those flora and fauna reaching the threshold value which could be affected by the project;
- To identify the spatial arrangements of habitats and the key processes that lead to the decline of endangered species (e.g., Fallowing, eutrophication, disturbance, intensification etc.)
- To determine the species including their habitat that might be threatened due to future development
- To identify the factors affecting the integrity of the existing flora and fauna in the ecosystems and the conservation status of relevant habitats and species;
- To set forth recommendations on preserving the species of the project area and ecology sensitive land use planning to keep the ecological system sustainable.
- To develop an interactive digital model for the ecological system for the project area

# 2. Methodology

## 2.1 An Inventory of the Flora and Fauna

Literature review was conducted to know the historical aspects of spatial distribution of habitats or species and compile habitat or species inventories on various scales, and also recognize the pattern of rarity. Status of habitats will also be known. Information of the underlying process of decline or increase can be achieved by an historical landscape analysis. Maps with the historical distribution of habitats from these sources should be drawn in the same resolution as the actual distribution. In addition to the secondary sources, primary data on existing flora and fauna will be collected using appropriate methods.

## 2.2 The comparative assessment of plant and animal communities

The comparative assessment of animals and plants has been conducting. Dependency of animals on particular plant species will be determined. Seasonal assemblage of animals in a particular habitat based on the phenology of the plant will be determined. Survey will be conducted in different seasons; thus, seasonal assemblage of flora and fauna will also be determined. All the information will be plotted on habitat map.

## 2.3 Sampling Technique for Inventory

To achieve the objectives of the project various methods will be used (Table 1).

Table 1. Survey methods in brief

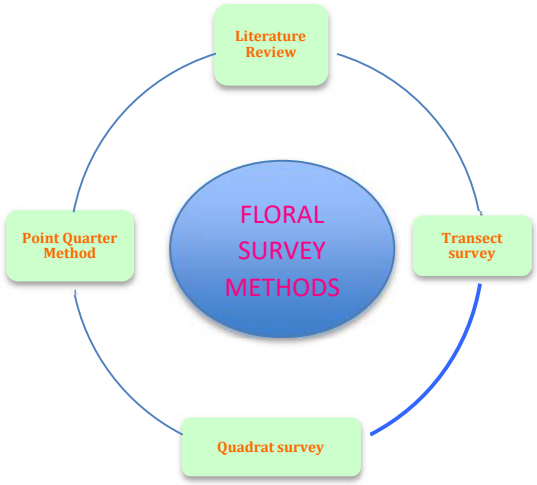
| Name of the Methods | Objectives to be fulfilled |
|---|---|
| **Survey Methods for Flora** | |
| **1. Literature Review**<br>**2. Transect survey**<br>**3. Quadrat survey**<br>4. **Point Quarter Method**<br>**5. Collection of plant parts** | ) To understand the existing floral distribution scenario and their significances in the ecosystem of the project area based on available secondary information from any baseline studies which already been carried out previously.<br>) To prepare an inventory list of the species of the existing flora, their spatial distribution, the species that are frequent and also which are rare.<br>) To identify the ecological characteristics of every ecological unit and the communities they form.<br>) To identify the characteristics and physical conditions of the habitats.<br>) To determine underlying process of habitats dynamism-char formation, afforestation, forest clearing, settlements, growth centers, dykes, land reclamation, drainage system improvement, etc. |
| **6. Questionnaire Survey** | ) To explore historical aspects of habitats and biodiversity in the area. |
| **Survey Methods for Fauna** | |
| **Direct Survey Methods**<br>1. Line Transect Sampling<br>2. Quadrat Sampling<br>3. Use of different types of traps<br>4. Counting at colonies and bat roosts | ) To understand the existing faunal distribution scenario and their significances in the ecosystem of the project area based on available secondary information from any baseline studies which already been carried out previously.<br>) To prepare an inventory list of the species of the existing fauna, their spatial distribution, the species that are frequent and also which are rare.<br>) To identify the ecological characteristics of every ecological unit and the communities they form.<br>) To identify the characteristics and physical conditions of their habitats. |

| Name of the Methods | Objectives to be fulfilled |
|---|---|
| 5. Night survey<br>6. Camera trap survey<br>7. Questionnaire survey<br>8. FGD<br>9. Boat Survey through river system or lake for aquatic animals<br>10. Survey on fish<br>**Indirect Survey Methods**<br>1. Pellet / scat / feces count<br>2. Footprint / Pugmark count<br>3. Other indices of presence | ) To determine underlying process of habitats dynamism-char formation, afforestation, forest clearing, settlements, growth centers, dykes, land reclamation, drainage system improvement, etc.<br>) To identify the flora and fauna reaching the threshold value which could be affected by the project.<br>) To identify the threats to the endangered species (e.g., Fallowing, eutrophication, disturbance, intensification).<br>) To determine the species including their habitat that might be threatened due to future development.<br>) To set forth recommendations on preserving the species of the project area and ecology sensitive land use planning to keep the ecological system sustainable.<br>) To develop an interactive digital model for the ecological system for the project area. |

## Detailed Survey Methods

### *i. Survey methods for flora*

Plant community were studied by following different methods. Parameters like frequency, density, abundance, presence, absence and dominance, diversity index were quantified.




### *a) Transect survey*

Transect survey were used to explore the existing floristic composition. Sample of the plant species were collected to prepare herbarium in order to identify the plant species wherever necessary. The floristic composition includes the occurred species of under trees, shrubs, herbs, climbers, epiphytes, parasites and ferns.

### *b) Quadrat survey*

The quadrat survey was used for assessing plant community structure, tree species diversity and their regeneration status. The estimate of species contents of a habitat were determined by observing the plant species at different sample areas.

### *ii. Survey methods for fauna*

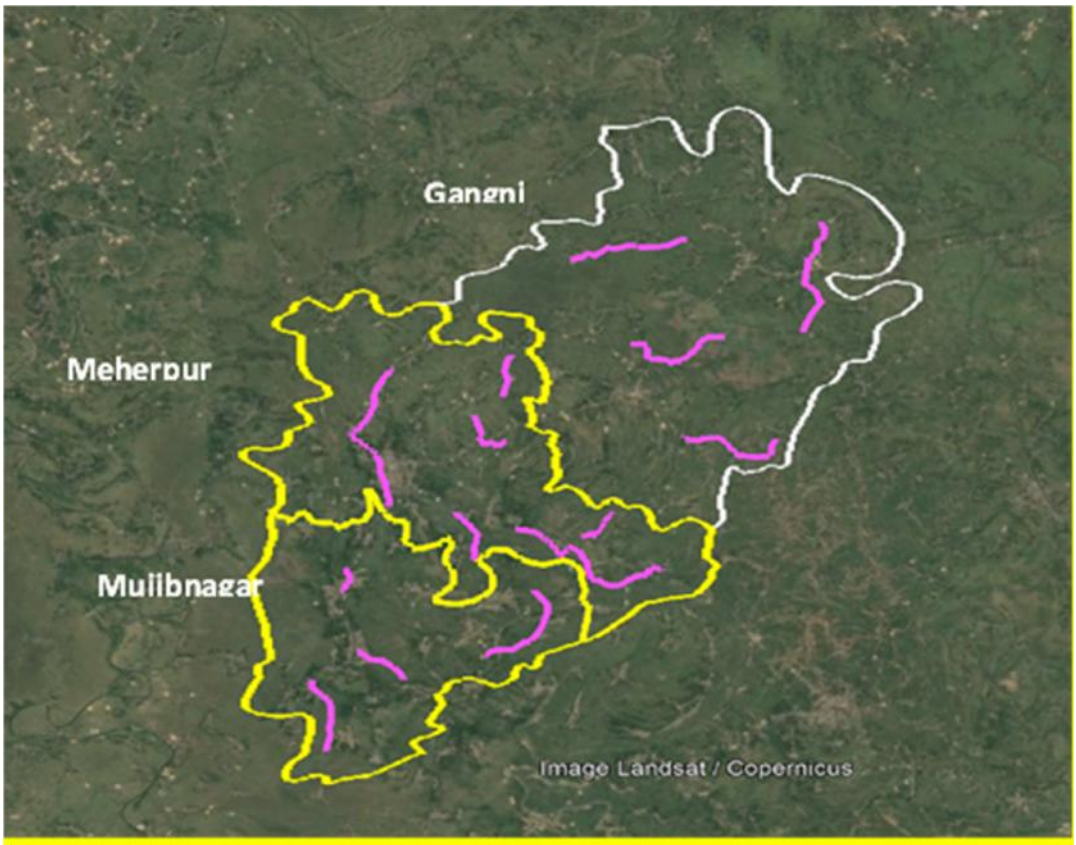
A combination of different methods were applied for the project work. Some of the methods are as follows.


## Direct Survey Methods

### *i. Line Transect Sampling*

Both temporary and permanent transect lines were set randomly covering all types of habitats. Visual encounter survey was conducted on foot both in day and night. All the wild animals were recorded from the both side of transect. GPS coordination was used to calculate the total transect area covered for survey. During river habitat survey, the river was considered as a transect line. A total of 14 transect lines including 6 transects in Meherpur sadar, 4 transects each in Gangni and Mujibnagar were selected for the study (Map 2, Table 2).

| Upazila | Transect | Habitat | Length (Km) |
|---|---|---|---|
| Meherpur Sadar | Transect 1 | Riverside/Riverine | 8.92 |
| | Transect 2 | Homestead | 3,41 |
| | Transect 3 | Homestead | 5.6 |
| | Transect 4 | Agricultural | 10.4 |
| | Transect 5 | Riverside/Riverine | 3.5 |
| | Transect 6 | Riverside/Riverine | 8.7 |
| Gangni | Transect 1 | Riverside/Riverine | 2.8 |
| | Transect 2 | Homestead | 2 |
| | Transect 3 | Homestead | 1.3 |
| | Transect 4 | Agricultural | 2.5 |
| Mujibnagar | Transect 1 | Homestead | 3.4 |
| | Transect 2 | Homestead | 4.6 |
| | Transect 3 | Riverside/Riverine | 5.3 |
| | Transect 4 | Agricultural | 7.3 |




Map. Line transects set up in different habitats of the study area based on field

### *ii. Use of different types of traps*

Pit fall trap, tube trap and box trap were used to capture cryptic species. All these traps were designed to capture live animals. Appropriate baits were used wherever necessary.

Setting up box trap for rodents at Amjhupi Union, Meherpur Sadar Upazila.

### *iii. Counting at colonies and bat roosts*

Bats and some of the birds are colonial and some also build nests in colonies. Bird colony and bat roosts were surveyed.

Indian Flying Fox colony at Bagoan Dakshin para, Govipur, Meherpur Sadar Upazila

### *iv. Night survey*

Night survey will be conducted with the aid of high-power flashlight. Nocturnal wild animals will be encountered during night survey.

Reptiles and Amphibian survey at Kajla river bank, Amjhupi, Meherpur Sadar Upazila

### *v. Camera trap*

Automatic digital camera traps were used to survey nocturnal and crepuscular animals. These camera traps are operated by motion sensor. The camera were automatically activated and captured photos if anything moves in front of it.

### *vi. Questionnaire survey*

A pre-designed questionnaire was used to know the status of wild animals and plants in the survey area based on the experience of the local people.

Questionnaire survey at different habitats in Meherpur district.

Questionnaire survey, Gourinagar, Mujibnagar, Meherpur

### *vii. River Habitat Surveys (RHS) & River Corridor Surveys (RCS) through Boat Survey for aquatic animals*

Boat survey were conducted in suitable sites to encounter aquatic animals like dolphins. Images of dolphins were also be used as a questionnaire among the local fishermen to know the past status of these aquatic mammals.

### *viii. Survey on fishes*

Local fishermen were visited to see their catch and types of available fishes. Local markets were also be surveyed to know the status of local fish. Both marine and freshwater fisheries were surveyed. The team members visited fish landing areas, fisher's village and local markets to learn about beneficiary's customs and attitudes. Direct observations and participation with the fishers for gear use, on-field surveillance, homestead drying of fishes, and selling at retail market of city, was the most useful and meaningful way to confirm the abundance and marketing of fishes, and to know about beneficiary's livelihood dynamics, work practices, vulnerabilities, and their indigenous knowledge in a social setting (Hossain *et al*. 2014; Deb and Haque 2011).


Local fish market survey at Kachabazar, Meherpur sadar, Meherpur

### Indirect Survey Methods

***i. Presence of Scat, feces and pellet***

Presence of scat, feces and pellet indicate the presence of certain species in the area.

*ii.* ***Footprint / Pugmark count***

This method is used for identifying and counting wild animals. In addition, the data were allow one to determine sex ratio and age structure of the population.

## 2.4 Identification of critical Species

During the survey any critical habitat (also why it is critical) and its significance needs to be identified, and protection status recorded in practice, a check of each individual species against the following were required in order to be to determine its protection status:

- IUCN's threatened category (Red Data Book-both National and global threatened category);
- Species protected under Wildlife (Protection and Security) Act 2012;
- Species protected under any protocol, conventions and any other agreement;
- Species considered as flagship species, keystone species or other significant species; and
- Endemicity of the species.

## 2.5 Identification of critical ecosystem and wildlife habitats

Habitats with high species diversity, population density of rare or threatened species will be determined from the field survey. Ecosystem services were also be determined from field observation and also by questionnaire survey and FGD. Critical ecosystem or habitats were plotted on the maps using GPS coordinates.

## 2.6 Mapping of the Site

As per survey findings, we prepared ecosystem based thematic map for every task of the site of the flora and fauna in ARC GIS and prepare data base which can be provided as shape file or map format in desire scale by consultation with PD.

## 2.7 Development of an Interactive Digital Model

From GIS based data base of the survey findings and their interpretation were integrated in a GIS module and to develop an interactive digital model of existing habitat, decline of habitat and possible areas of conservation. Historical changes of vegetation cover were evaluated from the previous 30 years image. Land use map were prepared accommodating wildlife habitat, vegetation cover, waterbodies, forests and other landmarks.

# 3. Work progress

Field surveys for flora and faunal surveys were conducted. During the field survey a total of 266 species of plants, 15 species of amphibians, 21 species of reptiles, 112 species of birds and 22 species of mammals have been recorded.

Table 2. List of amphibians recorded from Meherpur district

| Sl. No. | Family | Common Name | Scientific Name | Local Status | IUCN Threat Status | |
|---|---|---|---|---|---|---|
| | | | | | National | Global |
| 1 | Bufonidae | Common Toad | *Duttaphrynus melanostictus* | VC | LC | LC |
| 2 | | Marbled Toad | *Firouzophrynus stomaticus* | VC | LC | LC |
| 3 | Dicroglossidae | Asmat's Cricket Frog | *Fejervarya asmati* | UC | LC | LC |
| 4 | | Terai Cricket Frog | *Fejervarya teraiensis* | VC | LC | LC |
| 5 | | Pierre's Cricket Frog | *Fejervarya pierrei* | C | LC | LC |
| 6 | | Orissa Cricket Frog | *Fejervarya orissaensis* | C | LC | NE |
| 7 | | Crab-eating Frog | *Fejervarya cancrivora* | UC | LC | LC |
| 8 | | Syhadra Cricket Frog | *Fejervarya syhadrensis* | C | LC | LC |
| 9 | | Skipper Frog | *Euphlyctis cyanophlyctis* | VC | LC | LC |
| 10 | | Green pond frog | *Euphlyctis hexadactylus* | UC | LC | LC |
| 11 | | Indian Bullfrog | *Hoplobatrachus tigerinus* | UC | LC | LC |
| 12 | Rhacophoridae | Six-lined Tree Frog | *Polypedates leucomystax* | UC | LC | LC |
| 13 | Microhylidae | Ornate Microhylid Frog | *Microhyla ornata* | C | LC | LC |
| 14 | | Mymensingh Microhylid Frog | *Microhyla mymensinghensis* | UC | LC | LC |
| 15 | | Nilphamari Microhylid Frog | *Microhyla nilphamariensis* | C | NE | LC |

Green Frog at Kajla River at Ammjhupi, Meherpur Sadar.

Table 3. List of reptiles recorded during the field survey in Meherpur district

| Sl. No. | Family | Common Name | Scientific Name | Status | IUCN Threat Status | |
|---|---|---|---|---|---|---|
| | | | | | National | Global |
| 1 | Agamidae | Common Garden Lizard | *Calotes versicolor* | VC | LC | LC |
| 2 | Gekkonidae | Common House Gecko | *Hemidactylus frenatus* | VC | LC | LC |
| 3 | | Brook's House Gecko | *Hemidactylus brookii* | C | LC | LC |
| 4 | | Yellow-green House Gecko | *Hemidactylus flaviviridis* | C | LC | LC |
| 5 | Scincidae | Bronze Grass Skink | *Eutropis macularia* | C | LC | LC |
| 6 | | Keeled Grass Skink | *Eutropis carinata* | C | LC | LC |
| 7 | | Many-lined Grass Skink | *Eutropis multifasciata* | UC | LC | LC |
| 9 | Varanidae | Bengal Monitor Lizard | *Varanus bengalensis* | C | LC | LC |
| 10 | | Yellow Monitor | *Varanus flavescens* | UC | NT | EN |
| 11 | Typhlopidae | Common Blind Snake | *Ramphotyphlops braminus* | C | LC | LC |
| 12 | Colubridae | Checkered Keelback | *Xenochrophis piscator* | C | LC | LC |
| 13 | | Stripped Keelback | *Amphiesma stolata* | UC | LC | LC |
| 14 | | Common Smooth Water Snake | *Enhydris enhydris* | UC | LC | LC |
| 15 | | Common Wolf Snake | *Lycodon aulicus* | UC | LC | LC |
| 16 | | Indian Rat snake | *Ptyas mucosa* | C | LC | LC |
| 17 | Elapidae | Monocled Cobra | *Naja kaouthia* | R | NT | LC |
| 18 | | Binocled Cobra | *Naja naja* | R | NT | LC |
| 19 | | Common Krait | *Bungarus caeruleus* | R | LC | LC |
| 20 | | Banded Krait | *Bungarus fasciatus* | R | LC | LC |
| 21 | | Spotted Flapshell Turtle | *Lissemys punctata* | R | LC | LC |

Bengal Monitor Lizard at Gangni upazila of Meherpur.

Table 4 List of birds recorded from Meherpur district

| SL | Family | Common Name | Scientific Name | Habitat | IUCN National Redlist Status | IUCN Global Status | Remarks |
|---|---|---|---|---|---|---|---|
| 1 | Anatidae | Fulvous Whistling-Duck | *Dendrocygna bicolor* | Wetland | LC | LC | Anatidae |
| 2 | Anatidae | Lesser Whistling-Duck | *Dendrocygna javanica* | Wetland | LC | LC | Anatidae |
| 3 | Anatidae | Ruddy Shelduck | *Tadorna ferruginea* | Wetland | LC | LC | Anatidae |
| 4 | Anatidae | Common Shelduck | *Tadorna tadorna* | Wetland | LC | LC | Anatidae |
| 5 | Anatidae | Cotton Pygmy-Goose | *Nettapus coromandelianus* | Wetland | LC | LC | Anatidae |
| 6 | Anatidae | Garganey | *Spatula querquedula* | Wetland | LC | LC | Anatidae |
| 7 | Anatidae | Gadwall | *Mareca strepera* | Wetland | LC | LC | Anatidae |
| 8 | Anatidae | Indian Spot-billed Duck | *Anas poecilorhyncha* | Wetland | LC | LC | Anatidae |
| 9 | Anatidae | Mallard | *Anas platyrhynchos* | Wetland | LC | LC | Anatidae |
| 10 | Anatidae | Northern Pintail | *Anas acuta* | Wetland | LC | LC | Anatidae |
| 11 | Anatidae | Green-winged Teal | *Anas crecca* | Wetland | LC | LC | Anatidae |
| 12 | Anatidae | Red-crested Pochard | *Netta rufina* | Wetland | LC | LC | Anatidae |
| 13 | Anatidae | Common Pochard | *Aythya ferina* | Wetland | LC | VU | Anatidae |
| 14 | Columbidae | Rock Pigeon | *Columba livia* | Agriculture land | LC | LC | Columbidae |
| 15 | Columbidae | Eurasian Collared-Dove | *Streptopelia decaocto* | Agriculture land | LC | LC | Columbidae |
| 16 | Columbidae | Red Collared-Dove | *Streptopelia tranquebarica* | Agriculture land | LC | LC | Columbidae |
| 17 | Columbidae | Spotted Dove | *Spilopelia chinensis* | Homestead vegetation | LC | LC | Columbidae |
| 18 | Columbidae | Yellow-footed Green-Pigeon | *Treron phoenicopterus* | Homestead vegetation | LC | LC | Columbidae |
| 19 | Cuculidae | Greater Coucal | *Centropus sinensis* | Homestead vegetation | LC | LC | Cuculidae |
| 20 | Cuculidae | Chestnut-winged Cuckoo | *Clamator coromandus* | Homestead vegetation | LC | LC | Cuculidae |
| 21 | Cuculidae | Pied Cuckoo | *Clamator jacobinus* | Homestead vegetation | LC | LC | Cuculidae |
| 22 | Cuculidae | Asian Koel | *Eudynamys scolopaceus* | Homestead vegetation | LC | LC | Cuculidae |
| 23 | Cuculidae | Plaintive Cuckoo | *Cacomantis merulinus* | Homestead vegetation | LC | LC | Cuculidae |
| 24 | Cuculidae | Large Hawk-Cuckoo | *Hierococcyx sparverioides* | Homestead vegetation | LC | LC | Cuculidae |
| 25 | Cuculidae | Common Hawk-Cuckoo | *Hierococcyx varius* | Homestead vegetation | LC | LC | Cuculidae |
| 26 | Cuculidae | Indian Cuckoo | *Cuculus micropterus* | Homestead vegetation | LC | LC | Cuculidae |

| SL | Family | Common Name | Scientific Name | Habitat | IUCN National Redlist Status | IUCN Global Status | Remarks |
|---|---|---|---|---|---|---|---|
| 27 | Caprimulgidae | Large-tailed Nightjar | *Caprimulgus macrurus* | Homestead vegetation | LC | LC | Caprimulgidae |
| 28 | Podargidae | House Swift | *Apus nipalensis* | Homestead vegetation | LC | LC | Podargidae |
| 29 | Podargidae | Asian Palm Swift | *Cypsiurus balasiensis* | Homestead vegetation | LC | LC | Podargidae |
| 30 | Rallidae | Eurasian Moorhen | *Gallinula chloropus* | Wetland | LC | LC | Rallidae |
| 31 | Rallidae | Eurasian Coot | *Fulica atra* | Wetland | LC | LC | Rallidae |
| 32 | Rallidae | Watercock | *Gallicrex cinerea* | Wetland | LC | LC | Rallidae |
| 33 | Rallidae | White-breasted Waterhen | *Amaurornis phoenicurus* | Wetland | LC | LC | Rallidae |
| 34 | Recurvirostridae | Black-winged Stilt | *Himantopus himantopus* | Wetland | LC | LC | Recurvirostridae |
| 35 | Recurvirostridae | Pied Avocet | *Recurvirostra avosetta* | Wetland | LC | LC | Recurvirostridae |
| 36 | Charadriidae | Pacific Golden-Plover | *Pluvialis fulva* | Wetland | LC | LC | Charadriidae |
| 37 | Charadriidae | Little Ringed Plover | *Thinornis dubius* | Wetland | LC | LC | Charadriidae |
| 38 | Charadriidae | Northern Lapwing | *Vanellus vanellus* | Wetland | NT | NT | Charadriidae |
| 39 | Charadriidae | River Lapwing | *Vanellus duvaucelii* | Wetland | NT | NT | Charadriidae |
| 40 | Charadriidae | Yellow-wattled Lapwing | *Vanellus malabaricus* | Wetland | NT | LC | Charadriidae |
| 41 | Charadriidae | Gray-headed Lapwing | *Vanellus cinereus* | Wetland | LC | LC | Charadriidae |
| 42 | Charadriidae | Red-wattled Lapwing | *Vanellus indicus* | Wetland | LC | LC | Charadriidae |
| 43 | Charadriidae | Greater Sand-Plover | *Anarhynchus leschenaultii* | Wetland | LC | LC | Charadriidae |
| 44 | Charadriidae | Kentish Plover | *Anarhynchus alexandrinus* | Wetland | LC | LC | Charadriidae |
| 45 | Jacanidae | Pheasant-tailed Jacana | *Hydrophasianus chirurgus* | Wetland | LC | LC | Jacanidae |
| 46 | Jacanidae | Bronze-winged Jacana | *Metopidius indicus* | Wetland | LC | LC | Jacanidae |
| 47 | Scolopacidae | Common Snipe | *Gallinago gallinago* | Wetland | LC | LC | Scolopacidae |
| 48 | Scolopacidae | Common Sandpiper | *Actitis hypoleucos* | Wetland | LC | LC | Scolopacidae |
| 49 | Scolopacidae | Green Sandpiper | *Tringa ochropus* | Wetland | LC | LC | Scolopacidae |
| 50 | Scolopacidae | Marsh Sandpiper | *Tringa stagnatilis* | Wetland | LC | LC | Scolopacidae |
| 51 | Scolopacidae | Wood Sandpiper | *Tringa glareola* | Wetland | LC | LC | Scolopacidae |
| 52 | Scolopacidae | Common Redshank | *Tringa totanus* | Wetland | LC | LC | Scolopacidae |
| 53 | Scolopacidae | Common Greenshank | *Tringa nebularia* | Wetland | LC | LC | Scolopacidae |

| SL | Family | Common Name | Scientific Name | Habitat | IUCN National Redlist Status | IUCN Global Status | Remarks |
|---|---|---|---|---|---|---|---|
| 54 | Scolopacidae | Temminck's Stint | *Calidris temminckii* | Wetland | LC | LC | Scolopacidae |
| 55 | Scolopacidae | Red-necked Stint | *Calidris ruficollis* | Wetland | NT | NT | Scolopacidae |
| 56 | Scolopacidae | Little Stint | *Calidris minuta* | Wetland | LC | LC | Scolopacidae |
| 57 | Glareolidae | Oriental Pratincole | *Glareola maldivarum* | Wetland | LC | LC | Glareolidae |
| 58 | Laridae | Black-headed Gull | *Chroicocephalus ridibundus* | Wetland | LC | LC | Laridae |
| 59 | Laridae | Brown-headed Gull | *Chroicocephalus brunnicephalus* | Wetland | LC | LC | Laridae |
| 60 | Laridae | Pallas's Gull | *Ichthyaetus ichthyaetus* | Wetland | LC | LC | Laridae |
| 61 | Laridae | Little Tern | *Sternula albifrons* | Wetland | LC | LC | Laridae |
| 62 | Laridae | River Tern | *Sterna aurantia* | Wetland | NT | VU | Laridae |
| 63 | Laridae | Common Tern | *Sterna hirundo* | Wetland | LC | LC | Laridae |
| 64 | Podicipedidae | Little Grebe | *Tachybaptus ruficollis* | Wetland | LC | LC | Podicipedidae |
| 65 | Podicipedidae | Great Crested Grebe | *Podiceps cristatus* | Wetland | LC | LC | Podicipedidae |
| 66 | Ciconiidae | Asian Openbill | *Anastomus oscitans* | Wetland | LC | LC | Ciconiidae |
| 67 | Anhingidae | Oriental Darter | *Anhinga melanogaster* | Wetland | NT | LC | Anhingidae |
| 68 | Phalacrocoracidae | Little Cormorant | *Microcarbo niger* | Wetland | LC | LC | Phalacrocoracidae |
| 69 | Phalacrocoracidae | Great Cormorant | *Phalacrocorax carbo* | Wetland | LC | LC | Phalacrocoracidae |
| 70 | Phalacrocoracidae | Indian Cormorant | *Phalacrocorax fuscicollis* | Wetland | LC | LC | Phalacrocoracidae |
| 71 | Threskiornithidae | Black-headed Ibis | *Threskiornis melanocephalus* | Wetland | VU | LC | Threskiornithidae |
| 72 | Ardeidae | Cinnamon Bittern | *Botaurus cinnamomeus* | Wetland | LC | LC | Ardeidae |
| 73 | Ardeidae | Yellow Bittern | *Botaurus sinensis* | Wetland | LC | LC | Ardeidae |
| 74 | Ardeidae | Black-crowned Night Heron | *Nycticorax nycticorax* | Wetland | LC | LC | Ardeidae |
| 75 | Ardeidae | Little Egret | *Egretta garzetta* | Wetland | LC | LC | Ardeidae |
| 76 | Ardeidae | Striated Heron | *Butorides striata* | Wetland | LC | LC | Ardeidae |
| 77 | Ardeidae | Indian Pond-Heron | *Ardeola grayii* | Wetland | LC | LC | Ardeidae |
| 78 | Ardeidae | Eastern Cattle-Egret | *Ardea coromanda* | Wetland | LC | LC | Ardeidae |
| 79 | Ardeidae | Great Egret | *Ardea alba* | Wetland | LC | LC | Ardeidae |
| 80 | Ardeidae | Medium Egret | *Ardea intermedia* | Wetland | LC | LC | Ardeidae |
| 81 | Ardeidae | Gray Heron | *Ardea cinerea* | Wetland | LC | LC | Ardeidae |
| 82 | Accipitridae | Black-winged Kite | *Elanus caeruleus* | Agriculture land | LC | LC | Accipitridae |

| SL | Family | Common Name | Scientific Name | Habitat | IUCN National Redlist Status | IUCN Global Status | Remarks |
|---|---|---|---|---|---|---|---|
| 83 | Accipitridae | Oriental Honey-buzzard | *Pernis ptilorhynchus* | Agriculture land | LC | LC | Accipitridae |
| 84 | Accipitridae | Changeable Hawk-Eagle | *Nisaetus cirrhatus* | Agriculture land | LC | LC | Accipitridae |
| 85 | Accipitridae | Shikra | *Tachyspiza badia* | Agriculture land | LC | LC | Accipitridae |
| 86 | Accipitridae | Western Marsh Harrier | *Circus aeruginosus* | Agriculture land | LC | LC | Accipitridae |
| 87 | Accipitridae | Eastern Marsh Harrier | *Circus spilonotus* | Agriculture land | LC | LC | Accipitridae |
| 88 | Accipitridae | Pied Harrier | *Circus melanoleucos* | Agriculture land | LC | LC | Accipitridae |
| 89 | Accipitridae | Black Kite | *Milvus migrans* | Agriculture land | LC | LC | Accipitridae |
| 90 | Accipitridae | Brahminy Kite | *Haliastur indus* | Agriculture land | LC | LC | Accipitridae |
| 91 | Accipitridae | Gray-headed Fish-Eagle | *Icthyophaga ichthyaetus* | Wetland | NT | NT | Accipitridae |
| 92 | Accipitridae | Imperial Eagle | *Aquila heliaca* | Grasslands and Open habitats | VU | VU | Accipitridae |
| 93 | Accipitridae | White-eyed Buzzard | *Butastur teesa* | Agriculture land | LC | LC | Accipitridae |
| 94 | Accipitridae | Common Buzzard | *Buteo buteo* | Agriculture land | LC | LC | Accipitridae |
| 95 | Accipitridae | Long-legged Buzzard | *Buteo rufinus* | Agriculture land | LC | LC | Accipitridae |
| 96 | Strigidae | Collared Scops-Owl | *Otus lettia* | Homestead vegetation | LC | LC | Strigidae |
| 97 | Strigidae | Brown Fish-Owl | *Ketupa zeylonensis* | Homestead vegetation | LC | EN | Strigidae |
| 98 | Strigidae | Spotted Owlet | *Athene brama* | Homestead vegetation | LC | LC | Strigidae |
| 99 | Strigidae | Brown Boobook | *Ninox scutulata* | Homestead vegetation | LC | LC | Strigidae |
| 100 | Upupidae | Eurasian Hoopoe | *Upupa epops* | Grasslands and Open habitats | LC | LC | Upupidae |
| 101 | Meropidae | Asian Green Bee-eater | *Merops orientalis* | Grasslands and Open habitats | LC | LC | Meropidae |
| 102 | Meropidae | Chestnut-headed Bee-eater | *Merops leschenaulti* | Grasslands and Open habitats | LC | LC | Meropidae |
| 103 | Alcedinidae | Common Kingfisher | *Alcedo atthis* | Wetland | LC | LC | Alcedinidae |
| 104 | Alcedinidae | Stork-billed Kingfisher | *Pelargopsis capensis* | Wetland | LC | LC | Alcedinidae |
| 105 | Alcedinidae | White-throated Kingfisher | *Halcyon smyrnensis* | Wetland | LC | LC | Alcedinidae |
| 106 | Alcedinidae | Pied Kingfisher | *Ceryle rudis* | Wetland | LC | LC | Alcedinidae |

| SL | Family | Common Name | Scientific Name | Habitat | IUCN National Redlist Status | IUCN Global Status | Remarks |
|---|---|---|---|---|---|---|---|
| 107 | Coraciidae | Indian Roller | *Coracias benghalensis* | Homestead vegetation | LC | LC | Coraciidae |
| 108 | Coraciidae | Indochinese Roller | *Coracias affinis* | Homestead vegetation | DD | LC | Coraciidae |
| 109 | Megalaimidae | Coppersmith Barbet | *Psilopogon haemacephalus* | Homestead vegetation | LC | LC | Megalaimidae |
| 110 | Megalaimidae | Lineated Barbet | *Psilopogon lineatus* | Homestead vegetation | LC | LC | Megalaimidae |
| 111 | Megalaimidae | Blue-throated Barbet | *Psilopogon asiaticus* | Homestead vegetation | LC | LC | Megalaimidae |
| 112 | Picidae | Eurasian Wryneck | *Jynx torquilla* | Grasslands and Open habitats | LC | LC | Picidae |

A flock of Bank Myna at Gangni Bazar, Gangni

Table 5. List of mammals recorded from Meherpur district

| Sl. | N | | Relative Status | | | IUCN Threat Status | |
|---|---|---|---|---|---|---|---|
| | | | Meherpur Sadar | Gangni | Mujibnagar | Na | Global |
| 1 | Hoary-bellied Squirrel | *Callosciurus pygerythrus* | VC | VC | VC | LC | LC |
| 2 | Five-striped Palm Squirrel | Funambulus pennantii | C | C | C | LC | LC |
| 3 | Lesser Bandicoot Rat | *Bandicota bengalensis* | VC | VC | VC | LC | LC |
| 4 | Greater Bandicote Rat | *Bandicota indica* | VC | VC | VC | LC | LC |
| 5 | Eastern House Mouse | *Mus musculus* | VC | VC | VC | LC | LC |
| 6 | Fileld Mouse | Mus booduga | UC | UC | UC | LC | LC |
| 7 | House Rat | *Rattus rattus* | VC | VC | VC | LC | LC |
| 8 | Long-tailed Climbing Mouse | *Vandeleuria oleracea* | C | C | C | LC | LC |
| 9 | Asian House Shrew | *Suncus murinus* | VC | VC | VC | LC | LC |
| 10 | Indian Flying Fox | *Pteropus giganteus* | VC | VC | VC | LC | LC |
| 11 | Greater Short-nosed Fruit Bat | *Cynopterus sphinx* | C | C | UC | LC | LC |
| 12 | Lesser Asiatic Yellow Bat | *Scotophilus kuhlii* | R | R | R | LC | LC |
| 13 | Indian Pipistrelle | *Pipistrellus coromandra* | UC | UC | UC | LC | LC |
| 14 | Least Pipistrelle | *Pipistrellus tenuis* | R | R | R | LC | LC |
| 15 | Intermediate Roundleaf Bat | *Hipposideros larvatus* | R | R | R | LC | LC |
| 16 | Greater False Vampire Bat | *Lyroderma lyra* | UC | UC | UC | LC | LC |
| 17 | Small Indian Mongoose | *Herpestes auropunctatus* | C | C | C | LC | LC |
| 18 | Grey Mongoose | *Herpestes edwardsi* | C | C | C | LC | LC |
| 19 | Golden Jackal | *Canis aureus* | VC | VC | VC | LC | LC |
| 20 | Bengal Fox | *Vulpes bengalensis* | R | R | R | VU | LC |
| 21 | Jungle Cat | *Felis chaus* | R | R | R | NT | LC |
| 22 | Fishing Cat | *Prionailurus viverrinus* | R | R | R | EN | EN |

Northern Plain Langur at Mujibnagar, Meherpur.

# 4. Conclusion

Baseline data collection of the project has been designed to cover at least two vital seasons; monsoon and winter. Baseline data collection for both of the species has been completed. Monsoon is very important to acquire data on amphibians and reptiles as well as breeding birds. Winter is particularly important for the migratory birds. A dedicated expert team was involved with the project and we hope to deliver all kinds of deliverables on time. Data analysis is continuing and after that field trips will be conducted to cover up the data gaps.

# Appendix- 1

# FLORA AND FAUNA SURVEY UNDER "PREPARATION OF DEVELOPMENT PIAN FOR MEHERPUR DISTRICT

## Annex 1

## Questionnaire

### Flora and Fauna Survey Under "Preparation of Development Plan for Meherpur District

Location: Date & Time:

Respondent Name: Address:

Age: Sex: Religion/Cast: Education:

***Livelihood status***

1. How long have you been staying in this village / area?
2. Do you collect any resource (like fish, shell etc.) from the project area?
3. If yes then how frequent?
4. Do you or your family member go for hunting? Y / N
5. If yes, what are the species that you usually hunt for?
6. How frequent do you go for hunting? Daily / weekly / monthly / seasonally / yearly / ……..
7. Does any one in your village destroy bird nest / disturb / catch animals? If yes what kind of animals?
8. What do you do when you/ family members got sick? Use traditional medicine / go to K*abiraj or Boidda /* Buy medicine from shop / go to doctor.
9. Do you see following animals in your village / surrounding areas (show the color plate). If yes, how often you see or when did you see last time?

   Jungle cat…… Fishing Cat …….. Civets …….

   Jackal ……. …… Hog Badger…….…….. Porcupine ……

   Monkey ……. …. Deer …….. Others ……..…

10. Do you think biodiversity (forest, plants, animals) in your area decreasing? Y / N. if yes why?

11. Do you think proposed economic zone may harm biodiversity in your area? If yes how?

12. What should do to conserve biodiversity in your area?

13. Do you know about Wildlife Act / other law? Y / N.

14. Miscellaneous Information (if any):

Name and signature of the Interviewer: