Government of the People's Republic of Bangladesh
MINISTRY OF HOUSING AND PUBLIC WORKS
Urban Development Directorate (UDD)
82, Segunbagicha, Dhaka-1000

Mobilization Report

For

"Preparation of Development Plan for Mirsharai Upazila, Chittagong District: Risk Sensitive Land use Plan (MUDP)" an area of approximately 482.88 sq km. for

Package-6: Baseline Survey of Existing Flora and Fauna

Submitted by

ECAL Engineering Consultants and Associates Ltd. (ECAL)
▲architect ▲engineers ▲planners ▲management consultants

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December, 2017

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Engineering Consultants & Associates Ltd. (ECAL)

ইন্জিনিয়ারিং কনসালটেন্টস এন্ড এসোসিয়েটস লিমিটেড
ENGINEERING CONSULTANTS AND ASSOCIATES LIMITED
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Ref: ECAL/UDDP-Mirsharai/1544
Date: December 14, 2017

To,

Ahmed Akhtaruzzaman
Project Director
Preparation of development Plan for Mirsharai Upazila,
Chittagong District: Risk Sensitive Landuse Plan (MUDP)
Urban Development Directorate (UDD)
82, Segunbagicha, Dhaka-1000.

Subject : Submission of Mobilization Report.

Ref.   : as per Contract Agreement signed on 15th November, 2017.

Dear Sir,

We ECAL being the appointed consultant for "**Preparation of Development Plan for Mirsharai Upazila Chittagong District: Risk Sensitive Land use Plan (MUDP)" an area of approximately 482.88 sq km. (Package-6: Baseline Survey of Existing Flora and Fauna)**, are pleased to submit Mobilization Report as per contract and we are hoping that you and your organization will take appreciable efforts to pass commenced bill of Mobilization Report as early as possible.

I hope you will find our submission in order.

Thanking you

Yours Sincerely,

Mohammed Jamal Uddin
Executive Director

Enclo: Mobilization Report-40 copies (5 copies color & 35 copies black)

Mobilization Report
Baseline Survey of Existing Flora and Fauna-Package-06 of"Preparation of Development
Plan for MirsharaiUpazila, Chittagong District: Risk Sensitive Landuse Plan" Project under
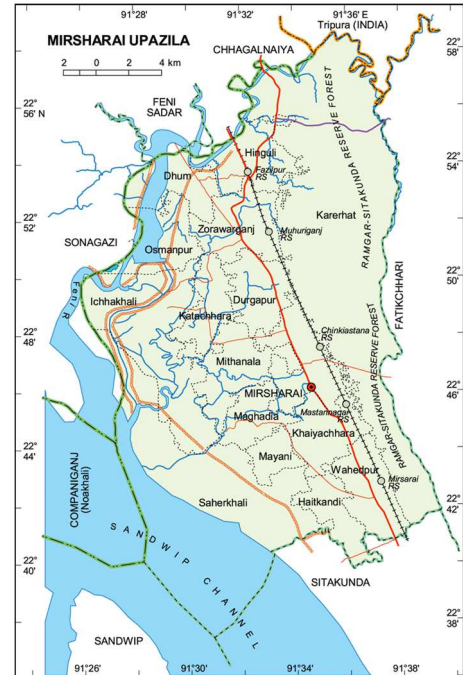Urban Development Directorate (UDD).

Section-1

BCKGROUND INFORMATION OF THE PROJECT

1.1.   Project Background

The total area of MirsharaiUpazila (CHITTAGONG
DISTRICT) is 482.88 sqkm(BBS)/509.80sqkm(GIS Data),
located in between 22°39' and 22°59' north latitudes
and in between 9I°27' and 91°39' east longitudes. It is,
bounded   by   Trippura   state   of   India,
ChhagalnaiyaandFeniSadarupazilas   on   the   north,
Sitakundaupazila and Bay of Bengal on the south,
Fatikchhariupazila   on   the   east,
SonagaziandCompaniganjupazilas   on   the   west.
Mirsharai Thana was formed in 1990 and it was turned
into an upazila in 1983. MirsharaiUpazila consists of 2
Municipality, 16 Union and 113 Mouza.

Mirsharai, the combination of lake and hilly area contains attractive scenic beauty on the
southernmost part of Bangladesh. The most important attraction of the upazila is that one
can travel MohamayaChara Lake by speed boat and explore hilly area and can enjoy
Khoiyachora, Baghbiani, Napitachora, Sonaichora, Mithachora and Boyalia waterfalls. This
area is located 192.2 km far from Dhaka and 4.5 hour bus journey. Anyone can travel by rail
and it is 197 km of rail journey and it takes 4.5 hour from Dhaka to MirsharaiUpazila. 56 km
from the Chittagong Divisional headquarters and takes 1.5 hour travel by bus. The
Bangladesh Road Transport Corporation introduced a direct bus service from Dhaka to
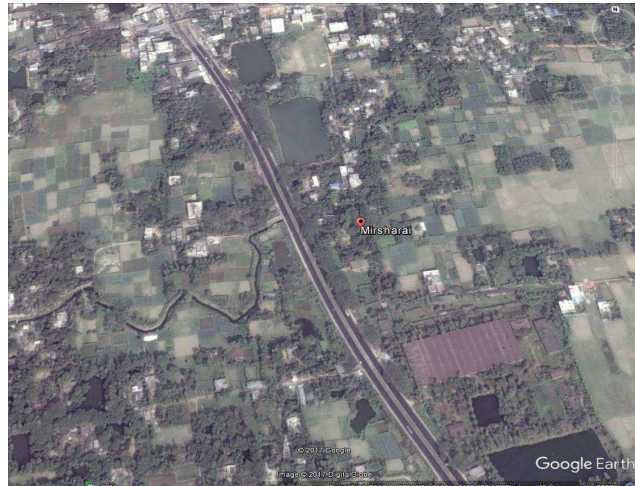*Mirsharai*viaComilla(Banglapedia,2012)

The Feni is the main river of MirsharaiUpazila; Sandwip Channel is also notable. There are 30
canals present in this area some of those are FeniNadi, Isakhali, Mahamaya, Domkhali,
Hinguli, Moliaish, KoilaGovania and MayaniKhal. The hills range on the northern and eastern
side of this upazila along the bank of the Feni River extended up to Chittagong and the
Chittagong hill tracts

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Historical Events: Sultan FakhruddinMobarak Shah conquered Chittagong in 1340 AD and established the Muslim rule in this region. During the reign of Gaur Sultans Hussain Shah and Nusrat Shah, Paragal Khan and Chhuti Khan were the rulers of this area. Subsequently Nizam Shah, brother of emperor Sher Shah, was the ruler of this area. NizampurPargana is named after Nizam Shah and the whole area of Mirsharai came under the control of Nizampurpargana. From the beginning of the 16th century this region was very rich in Bangia literature. Most of the time between 1580 and 1666 this region was under the control of the Arakanese. The place at which (of the present Mirsharaithana) BujurgUmed Khan, son of SubadarSayesta Khan, landed after crossing the Feni River was named as BujurgUmedpur. With the conquest of Chittagong by BujurgUmed Khan in 1666, this region came permanently under the Mughal rule. Towards the *end* of British rule in India, Durgapur and Karerhat areas of Mirsharaiupazila were the centers of revolutionary activities of Chittagong. A fierce battle was fought between the freedom fighters (under Capt. Wali Ahmed) and the Pak army at a place adjacent to the Fenafuni Bridge on the south of Mirsharaisadar in which about 100 Pak soldiers were killed. Besides, direct encounters were held between the freedom fighters and the Pak army at many' places including Shuvapur Bridge, Hinguli Bridge, Aochi Mia Bridge and Mostan Nagar.

Main occupations: Agriculture is the main occupation(38.93%) here with the others like non-agricultural labourer 3.61%, industry 0.57%, commerce 13.26%,transport and communication 2.93%, service 18%, construction 1.19%, religious service 0.34%, rent and remittance 8.84% and others 12.33%. Total cultivable land 22,896.40 hectares, fallow land 147733 hectares; single crop 38.91%, double crop 42.46% and treble crop land 18.63%. At present Cultivable land under irrigation is 6,917.85 hectare. Ownership of agricultural land Landowner 51.30%, 'landless 48.70%; agricultural landowner: urban 38.82% and rural 52.09%

Value of Land: The market value of the first grade arable land is Tk 30000 per 0.01 hectare. Main crops Paddy, potato, aborigine, bean, tomato, pumpkin and radish. Extinct or nearly

extinct crops Sugarcane, jute, arahar, sesare, linseed, ground nut. Main fruits Mango, blackberry, jackfruit, banana, papaya, litchi, pineapple,

Communication facilities Roads: Pucca road 230 km, semi-pucca road 119 km, mud road 1435 km; railway 16 km; waterway 11 nautical miles, Rail junction 4. Extinct or nearly extinct traditional transport Palanquin, bullock cart. Noted manufactories Carpet industry, pipe mill, ice factory, rice mill, bakery, brick-field, steel furniture, fish- poultry' feed' factory, bidi factory. There are also Cottage industries, Goldsmith, blacksmith, potteries, weaving, tailoring, bamboo and wood work. Hats, bazars and fairs Hats and bazars are 52, fairs 5, most noted of which are Abu Torab Bazar, Kamar Ali Bazar, Bara Daroga Hat, Mahajan Hat, Rarer Hat, Baraia Hat, Shantir Hat, ZorwarganjBaishakhiMela, BaruniSnanMela and ShadhinataMela. Main exports product is Bamboo, fish, paddy, potato, banana, vegetables.

NGO Activities: Operationally important NGOs are BRAC, Proshika. ASA, Sheba, CARE, and Hunger Project.Upazila health complex 1, family planning centre 16, satellite clinic 11.

Opportunity: Bangladesh can earn money in local and also in foreign exchange by opening a tourist resort at *Mirsharai.* The spot, if properly developed will become an excellent holiday resort and tourist centre. Rowing facility can be arranged easily; fishing and hunting facilities are already there. The success of developing *Mimharai*as a tourist centre and Special Economic Zone depends much on good communication facilities and availability of modern amenities. Moreover, the proposed *Special Economic Zone* would generate many industry-related new activities including huge vehicular traffic such as air, rail, road and water. This phenomenon would have both positive and negative impact on the socio-economic condition and existing land use pattern of the region. The proposed planning package would guide such probable changes in the socio-economic condition and land use pattern of the region, and would also address the adverse impact of such changes.

The proposed project would be prepared on a regional development perspective considering the region as a part of whole of Mirsharai Upazila and its 16 unions. In this development planning package since its location is strategically important from the regional context because *this* upazila is situated on the way to Dhaka Chittagong highway as the highway runs through this upazila.

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Mobilization Report
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Description of the Project Area: A detailed description of the Project Area is given below:

Table: Area, Population and Density of the Project Area:

Municipality	Union	Mouza	Village	Population		Density (per sq km)	Literacy Rate (%)
				Urban and Other Urban	Rural		
2	16	103	208	31206	367510	826	55.1

Source: BBS, 2011

Mirsharai sea beach, hilly area, Mohamaya Chara Lake, Khaiya Chara region has the greater potential for tourism development as there are abundant resources to attract tourists. Mirsharai is developing in an unplanned and haphazard manner very rapidly due to the ample opportunity for tourism development, which is acting as pull factor for private sector developers. Hence, this project has been under taken to protect the region from depletion of its natural resources and character and tourism development as well.

Moreover, honorable MoHPW Minister expressed his heartiest interest to develop char of this Upazila as an exclusive economic zone; as well as to establish a tourist zone and economic zone covering Mirsharaiupazila.

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Section-2

OBJECTIVES OF THE PROJECT

2.1   Objectives of the Project

The objective of the project is to-optimize coastal resources and activities for sustenance of marg. The coastal activities and resources are very important to the economy and life of the people of whose living conditions are inextricably linked to the productivity and sustainability of coastal zone. This long term Holistic Development Plan for the coastal zone. Coastal zone 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 coastal zone. The major objectives of the projects are as follows.

(i)   To integrate coastal zone with the mainstream of development process of the country.

(ii)   To frame policies for the best use of land and its control for the MirsharaiUpazila.

(iii)   To optimize coastal environment for sustenance of marginal people.

(iv)   Formulation of Policies and plans for mitigation of different types of hazards, minimizing the adverse impacts of climate change and recommend possible adaptation strategies for the region.

(v)   Formulation of Policies and plans for gradual nucleation of settlements with policies and plans for development of growth centers of the area.

Formulation of a planning package for development of tourism in MirsharaiUpazila, and also to accommodate future changes in existing land use pattern, socio-economic condition of the area and quality of life of the people due to establishment of the third sea port in the region in an integrated and comprehensive manner.

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2.2   Objectives the baseline survey of existing flora and fauna:

However, some of the specific objectives of the baseline survey of existing flora and fauna
are as follows.

- To prepare an inventory on existing flora and fauna of Mirsarai upazila.
- To identify threatened species of wild plants and animals.
- To identify critical ecosystem and wildlife habitats in this area.
- To prepare habitat map of existing flora and fauna.
- To determine the potentiality of natural resources for ecotourism development.
- To determine potential threats to the wild plants, animals and their critical habitats and
  also on the critical ecosystems due to the developmental activities.
- To prepare a strategic and management plan to mitigate the potential impacts on the
  ecosystem or species.

Section-3

METHODOLOGY FOR THE ASSIGNMENT

3.1   An Inventory of the Flora and Fauna

Habitat types will be categorized after the reconnaissance field survey and the survey sites will be selected based on different habitats. Survey points will be selected randomly but ensuring to cover all types of habitats and also covering most of the area of the Upazila. Survey sites will be plotted on the map using GPS coordinates.

3.1.1 Survey methods for flora

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

3.1.1.1 Transect survey

Transect survey will be used to explore the existing floristic composition of Mirsharai upazila. Sample of the plant species will be 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.

3.1.1.2Quadrate survey

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

In the quadrates, trees of ≥5cm diameter will be counted. Moreover, total height and diameter of the trees individuals of different species will also be recorded. The parameters that are commonly used to characterize the structure of the plant communities are:
Density, Frequency, Abundance, Vegetation Coverage, Basal area, Dominance, Species richness index, Similarity index, Shannon-Wiener diversity index, Index of similarity etc.

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3.1.2 Survey methods for fauna

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

3.1.2.1   Line Transect Sampling

Both temporary and permanent transect line will be set randomly covering all types of habitat. Visual encounter survey will be conducted on foot both in day and night. All the wild animals will be recorded from the both side of transect. GPS coordination will be used to calculate the total transect area covered for survey.

During river habitat survey, the river will be considered as a transect line.

3.1.2.2 Quadrate Sampling

Randomly selected quadrates with fixed (10m × 10m) or variable size will be taken in different habitats. Small sized wild animals like amphibians and reptiles will be quantified using quadrat sampling.

3.1.2.3 Use of different types of traps

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

3.1.2.4Counting 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 will be surveyed.

3.1.2.5 Night survey

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

3.1.2.6. Camera trap

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

3.1.2.7. Questionnaire survey

A pre-designed questionnaire will be used to know the status of wild animals and plants in this Upazila based on the experience of the local people.

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8. FGD

Focal Group Discussion (FGD) will be conducted among the local inhabitants to assess historical status of animals and plants in this area.

3.2   The Comparative Assessment of the Plant and Animal Communities:

Different types of habitats will be categorized like hilly area, plain lands, wetlands, homestead vegetation, riverbanks, agricultural fields etc. Same survey methods will be repeated in all types of habitats so a comparison would be made. Comparison of plant and animal diversity would be justified using different diversity indices from the data. Critical ecosystem or habitats would be identified by considering the number of species presents there, number of threatened species and the ecosystem services of the ecosystem.

3.3   Indicator species monitoring:

Species, which indicate the health of the environment by their presence, absence or any abnormalities of change in their population, health or behavior. Indicator species will be selected from all the groups based on the habitat or target of monitoring. Indicator species from plants, amphibians, reptiles, birds and mammals will be selected. Each of the indicator species will be finally selected after the initial field visit. Population status of all the indicator species will be monitored.

3.4   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 will also be determined from field observation and also by questionnaire survey and FGD. Critical ecosystem or habitats will be plotted on the maps using GPS coordinates.

3.5   Characterizing Impacts and Mitigation:

To illustrate how significant impacts (adverse or beneficial) that might occur due to tourism development and establishment of Mirsharai Economic zone, BISIC industry and salinity of water as well, in the absence of mitigation and compensation measures, shall be quantified and characterized in the following way:

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- determine the value of existing flora and fauna affected, through survey and study:

- assess impacts affecting those flora and fauna, which meet or exceed a defined threshold value, with reference to ecological processes and functions as appropriate;

- quantify the extent, magnitude, duration, timing and frequency of the impacts;

- assess impact reversibility;

- explain the level of confidence in these predictions; and

- Identify likely significant impacts in the absence of any mitigation.

3.6   Evolution of Project Design and Mitigation:

- Identify measures to avoid or reduce negative impacts;

- Identify opportunities for enhancement;

- Demonstrate likely success of mitigation measures; and

- Provide sufficient information for mitigation measures to be implemented effectively, *e.g.* Through an Environmental Action Plan (EAP).

3.7   Identify Significant Residual Impacts and Their Legal, Policy and Development Control Consequences:

- Produce a clear summary of the significant residual impacts of the project incorporating mitigation and enhancement measures;

- Where significant impacts cannot be avoided/reduced, identify compensation measures to be implemented;

- Consider the consequences of significant residual impacts in the light of planning policies and legislation; and

- Include mitigation, compensatory actions and enhancements in the EAP or similar.

3.8   Mapping of the Site:

The site of the flora and fauna will be mapped in ARC GIS and present at a scale in consultation with PD.

3.9   Development of an Interactive Digital Model:

Finally develop an interactive digital model of existing habitat, decline of habitat and possible areas of conservation.

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3.10   Submission of Final Report:

The Final report will set out clearly about information on existing flora and fauna necessary for decision making. Key aspects include: Description of baseline and trends of existing flora and fauna, explanation of the criteria used to evaluate existing flora and fauna; and assess the significance of impacts of the project;Statement of methodology used;Presentation of analytical techniques used and the analysis itself; and interpretation from the analysesidentification of likely impacts on existing flora and fauna; and an explanation of their significance and the level of certainty with which this can be stated; and description of legal and policy consequences.

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Section-4

WORK PROGRAM &REPORTING SCHEDULE

4.1   Schedule of Work

Table-1:

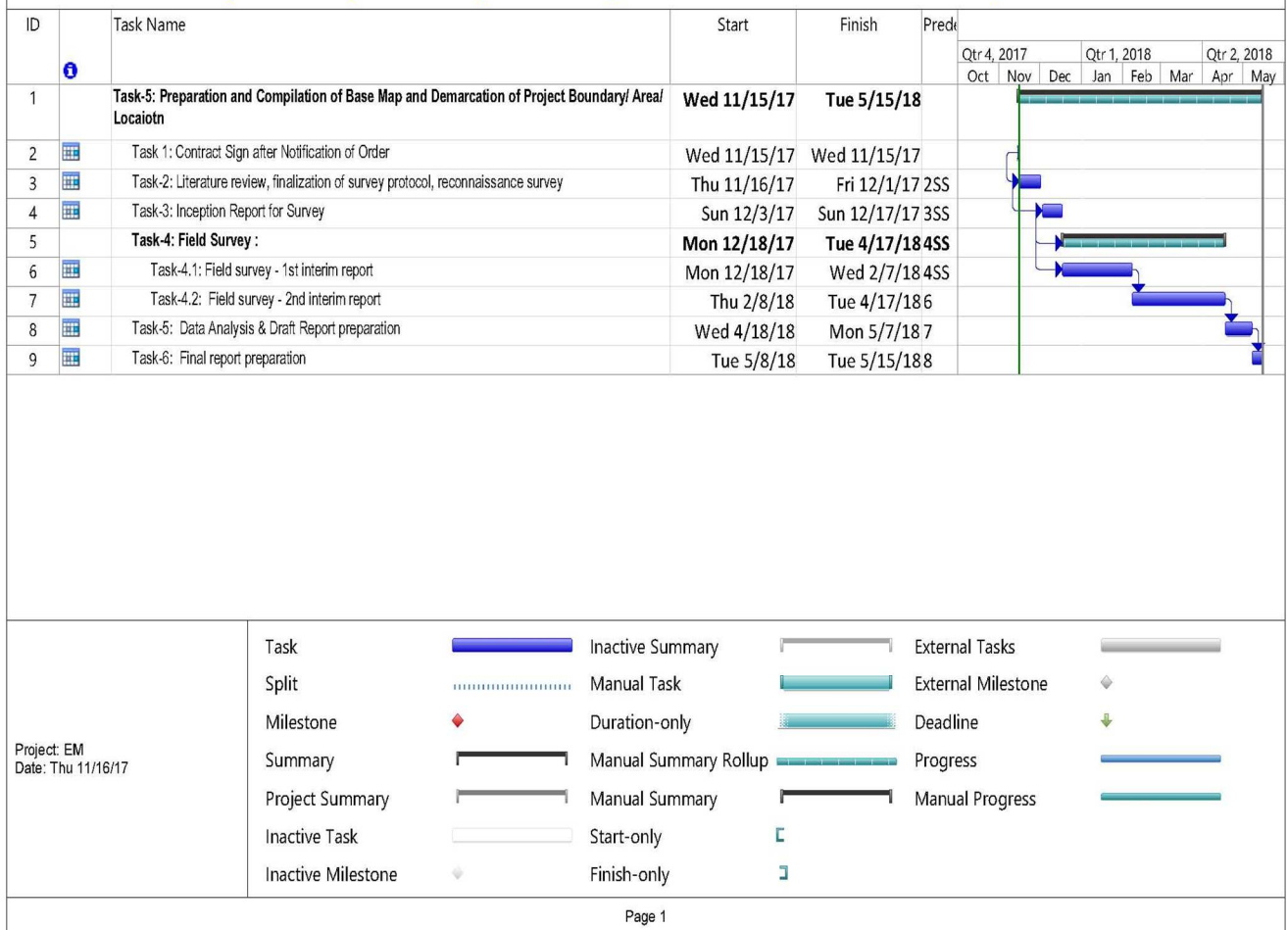| Report	Activities/Tasks	Duration (in day)	Start Date	End Date
Signing of Contract & Notification of Order	Task 1: Contract Sign after Notification of Order	1	15.11.2017	15.11.2017
Mobilization Report	Task-2: Literature review, finalization of survey protocol, reconnaissance survey	15	16.11.2017	01.12.2017
Inception Report	Task-3: Inception report for Field Survey	15	02.12.2017	17.12.2017
Interim Report	Task-4: Field Survey Task-5: Field survey - 1st interim report Task-6: Field survey - 2nd interim report	120	18.12.2017	17.04.2018
Draft Report	Task-7: Data Analysis & Draft report preparation	20	18.04.2017	07.05.2018
Final Report	Task-8: Final report preparation	7	08.05.2018	15.05.2018

4.2   Gantt Chart of Work:

FIGURE 5.2:

Gantt Chart of Project Activity for Survey of Esisting Flora and Fauna of Mirsharai Upazila

ID		Task Name	Start	Finish	Prede
1		**Task-5: Preparation and Compilation of Base Map and Demarcation of Project Boundary/ Area/ Locaiotn**	**Wed 11/15/17**	**Tue 5/15/18**	
2		Task 1: Contract Sign after Notification of Order	Wed 11/15/17	Wed 11/15/17	
3		Task-2: Literature review, finalization of survey protocol, reconnaissance survey	Thu 11/16/17	Fri 12/1/17	2SS
4		Task-3: Inception Report for Survey	Sun 12/3/17	Sun 12/17/17	3SS
5		**Task-4: Field Survey :**	**Mon 12/18/17**	**Tue 4/17/18**	4SS
6		Task-4.1: Field survey - 1st interim report	Mon 12/18/17	Wed 2/7/18	4SS
7		Task-4.2: Field survey - 2nd interim report	Thu 2/8/18	Tue 4/17/18	6
8		Task-5: Data Analysis & Draft Report preparation	Wed 4/18/18	Mon 5/7/18	7
9		Task-6: Final report preparation	Tue 5/8/18	Tue 5/15/18	8

Project: EM Date: Thu 11/16/17	Task	▬▬▬▬	Inactive Summary	▭▭▭	External Tasks	▬▬▬
	Split	....	Manual Task	▬▬▬	External Milestone	◆
	Milestone	◆	Duration-only	▬▬▬	Deadline	⬇
	Summary	�...▬	Manual Summary Rollup	▬▬▬	Progress	▬▬▬
	Project Summary	▬...▬	Manual Summary	▬▬▬	Manual Progress	▬▬▬
	Inactive Task	▭▭	Start-only	⸢		
	Inactive Milestone	◇	Finish-only	⸥		

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4.3 Report out line and Schedule of Report submission

The outlines of the deliverables and the timeframe for their submission are given in the following Table below.

Table -2: List of deliverables with their tentative outlines

SI No.	Deliverables	Outline of Deliverables
1	Mobilization Report	▪ Background Information and objectives of the Project ▪ Methodology for the Assignment ▪ Work schedule& Reportingof the project work ▪ Team Composition and Responsibilities ▪ Immediate action taken after signing agreement
2	inception Report	▪ Introduction ▪ Description of sub-activities;. ▪ Method and materials for each activity ▪ Required resources allocation ▪ Revised work schedule for completion of the work
3	Interim Report	▪ Identified existing flora and faun ▪ Stating which species are rare and which species are endangered H Identify the habitats of the flora and fauna ▪ Identify the characteristics of the flora and fauna
4	Finial Report	▪ Description of baseline and trends of existing flora and fauna, if the project were not to go ahead; ▪ Explanation of the criteria used to evaluate existing flora and fauna; and assess the significance of impacts of the project ▪ Explanation of the criteria used to evaluate existing flora and fauna; and assess the significance of impacts of the project ▪ Statement of methodology used ▪ Presentation of analytical techniques used and the analysis itself; and interpretation from the analyses ▪ Identification of likely impacts on existing flora and fauna; and an explanation of their significance and the level of certainty with which this can be stated ▪ A digital map of the existing flora and fauna ▪ Description of legal and policy consequences

Mobilization Report

Baseline Survey of Existing Flora and Fauna-Package-06 of"Preparation of Development Plan for MirsharaiUpazila, Chittagong District: Risk Sensitive Landuse Plan" Project under Urban Development Directorate (UDD).

Table 3: List of Report with Language, No. of Copies, Period of Submission, Binding status and Mode of Payment

Report	Language	No. of Copies	Period of Submission	Binding Status	Mode of Payment (% of Contract amount)
Mobilization Report	English	50	Within 15 days of signing contract	Spiral Binding	Not more than 15%
Inception Report	English	50	End 1st month	Spiral Binding	Not more than 20%
Interim Report	English	50	End of 4th month	Spiral Binding	Not more than 35%
Draft Report	English & Bangla	100	After submission of Interim report next 20days	Spiral Binding	Not more than 10%
Final Report	English & Bangla	100	End of 6thmonth	Spiral Binding	Not more than 20%

Section-5

TEAM COMPOSITION AND RESPONSIBILITIES

5.1 Experts List and qualification:

Sl. No.	Name of Staff	Qualification with year of Passing	Experience (in years)	Proposed Position
Professional Experts:				
1	Prof. Dr. Md. KamrulHasan	PhD Professor of Zoology at Jahangirnagar University	16	Team Leader/ Baseline Survey of Existing Flora and Fauna Expert
2	Mohammed. Jamal Uddin	MS Associate Professor of Environmental Science at Jahangirnagar University	25	Environmental Impact Assessment Expert
3	AnikSaha	MSc in Zoology with specialization on wildlife biology	5	Associate Baseline Survey of Existing Flora and Fauna Expert
4	Md. TouhidurRahman	MSc student in Zoology focusing on wildlife biology	2	Research Assistant Baseline Survey of Existing Flora and Fauna
Supporting Staffs:				
4	Md. Takib Bin Rouf	M.Sc (Environmental Sciences) from Jahangirnagar University, Appear. B.Sc (Environmental Sciences), from Jahangirnagar University, 2015.	2	Associate Field Researcher
5	Masfiq Bashir	M.Sc (Environmental Sciences) from Jahangirnagar University, Appear. B.Sc (Environmental Sciences), from Jahangirnagar University, 2014.	2	Associate Field Researcher
6	Santosh Kumar Roy	Diploma in Computer Science. M. A. (Philosophy), under National University, 1996 B. A. under Dhaka University, 1990.	25	Office Manager
7	Nazmul Hossain	H. Sc. Pass	5	Peon

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5.2 Responsibilities of Experts:

5.2.1 Baseline Survey of Existing Flora and Fauna Expert- 1 Person (1x3 = 3 mm.)

Responsibility: (i) To make an inventory of all types existing flora and fauna in the project area including endangered species, (ii) to identify the potentiality of the natural resources (flora and fauna) for tourism development in the region.(iii) To identify environmental hazards that might de imparted on the flora and fauna due to tourism development and establishment of Mirsharai Economic zone, BISIC industry and salinity of water; (iv) To prepare a map of habitat for existing flora and fauna of the project area indicating communities of various species of plants including the areas that would be disturbed by tourism development and establishment of Mirsharai Economic zone, BISIC industry and salinity of water as well; (v) To earmark the areas, which would not be disturbed by any kind of development; (vi) To make recommendations to protect the fore's', resources from environmental hazards and also to preserve the endangered species from depletion to attain sustainable development; (vii) To develop an interactive digital model for the whole ecological system with special reference to flora and fauna in the project area.(viii) To prepare report on assigned task under the scope of work of the ToR; (ix) Any other related task as assigned by PD.

5.2.2 Environmental Impact Assessment Expert- 1 Persons (1x2 = 2 mm.)

Responsibility: (i) Prepare guidelines for environment impact assessment (EIA) for tourism development and establishment of Mirsharai Economic zone, BISIC industry and salinity of water in the region with special reference to existing flora and fauna; (ii) Conduct EIA for various proposed projects under the planning; (iii) To identify the establishments to be established in environmentally critical areas in the region and provide with required remedial measures, and also develop control and regulatory mechanisms for sustainability of the flora and fauna in the region; (iv) To identify the location of habitats that shall be preserved to keep the biodiversity of the region sustainable; (v) To identify the endangered species of the region and earmark the site for their conservation and selecting site for safari park and sanctuary; (v) determination of criteria for selecting site for tourism development; {vi) To examine the environmental condition of the proposed tourism sites and recommend remedial measures with special reference to existing flora and fauna of the region; (vii) To develop an Environmental Action Plan (EAP) for mitigation measures to be implemented effectively. (viii) To work closely with the GIS/RS specialist to integrate the environmental considerations into spatial database; (ix) Any other related jobs assigned by PD.

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5.2.3   Associate Baseline Survey of Existing Flora and Fauna Expert— 1 Persons(1x3= 3 mm.)

Responsibility: To assist the Baseline Survey of Existing Flora and Fauna Expert

(i) To make an inventory of all types marine resources in the project area including endanger species, (ii) to identify the potentiality of the marine resources (flora and fauna) for tourism development in the region.(iii) To identify environmental hazards that might de imparted on the marine resources due to tourism development and establishment of Mirsharai Economic zone, BISIC industry and salinity of water in the region; (iv) To prepare a map for marine resources of the project area indicating communities of various species of plants includingthe areas that would be disturbed by tourism development and establishment of Mirsharai Economic zone, BISIC industry and salinity of water in the region as well; (v) To earmark the areas, which would not be disturbed by any kind of development; (vi) To make recommendations to protect the marine resources from environmental hazards and also to preserve the endangered species from depletion to attain sustainable development; (vii) To develop an interactive digital model for the whole ecological system with special reference to marine resources in the project area; (ix) Any other related task as assigned by PD.

5.2.4   Research Assistant Baseline Survey of Existing Flora and Fauna Expert – 1 person (1 x 3-3 mm).

Responsibility: To assist the Baseline Survey of Existing Flora and Fauna Expert

(i) To make an inventory of all types marine resources in the project area including endanger species, (ii) to identify the potentiality of the marine resources (flora and fauna) for tourism development in the region.(iii) To identify environmental hazards that might de imparted on the marine resources due to tourism development and establishment of Mirsharai Economic zone, BISIC industry and salinity of water   in the region; (iv) To prepare a map for marine resources of the project area indicating communities of various species of plants includingthe areas that would be disturbed by tourism development and establishment of Mirsharai Economic zone, BISIC industry and salinity of water in the region as well; (v) To earmark the areas, which would not be disturbed by any kind of development; (vi) To make recommendations to protect the marine resources from environmental hazards and also to preserve the endangered species from depletion to attain sustainable development; (vii) To develop an interactive digital model for the whole ecological system with special reference to marine resources in the project area; (ix) Any other related task as assigned by Project Director.

Section-6

IMMEDIATE ACTION TAKEN AFTER SIGNING AGREEMENT

1. **To Engage the Experts and relevant man-power for the project works.**

2. **Literature review and desktop study on project area regarding work plan:**

3. **Reconnaissance field visit at project area:** A Expert Consultant Team has been visited around the project area to acquire the knowledge on geomorphology, vegetation cover,biodiversity, physical infrastructure and socio-economic conditions of the inhabitant. In this field visit the following spot has been covered which are given bellow:

   a. Khoiyachora

   b. MohamayaChara Lake

   c. Economic Zone along the Coastal area

   d. Two Forest Offices (Land Forest office and Coastal Forest office) at Mirasharai.

   e. Korer Hat Forest Office

   f. Also Project Office at Mirasharai.

Some Reconnaissance Field Visit Pictures are given next page:

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Reconnaissance Field Visit Pictures:

A) Khaiya Chara

B) Mohamaya Chara Lake,

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C) Economic Zone at coastal area

D) Robber Dam on Mohamaya Chara Lake,

C) Economic Zone at coastal area

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E) Development work in Economic Zone at coastal area, :

F) Paddy field on coastal flood plain at Mirasharai Upazila.

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Mobilization Report
Baseline Survey of Existing Flora and Fauna-Package-06 of"Preparation of Development
Plan for MirsharaiUpazila, Chittagong District: Risk Sensitive Landuse Plan" Project under
Urban Development Directorate (UDD).

G) Vegetable cultivation land at Mirasharai Upazila

H) Expert team of consultant and UDD personnel.

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