Information Sheet on Flyway Network Sites

Notes for compilers:

The management body intending to nominate a site for inclusion in the East Asian - Australasian Flyway Site Network is requested to complete a Site Information Sheet. The Site Information Sheet will provide the basic information of the site and detail how the site meets the criteria for inclusion in the Flyway Site Network.

The Site Information Sheet has been divided into two sections. Part 1 (Section 1-14) seeks basic information on the site and it is essential that it be completed. Part 2 seeks additional information and is optional.

The Site Information Sheet is based on the Ramsar Information Sheet. If the site proposed for the Flyway Site Network is an existing Ramsar site then the documentation process can be simplified. In this case the National Government Partner need only send a copy of the existing sheets with additional details on Question 1 and 10 of the Flyway Site Information Sheet.

Once completed, the Site Information Sheet (and accompanying map(s)) should be submitted to the Flyway Partnership Secretariat. Compilers should provide an electronic (MS Word) copy of the Information Sheet and, where possible, digital copies of all maps.

Part 1: Essential Information

1. Name and contact details of the compiler of this form:

The full name, institution/agency, and address of the person(s) who compiled the SIS, together with any telephone and fax numbers and e-mail address.

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2. Date this sheet was completed:

The date on which the SIS was completed (or updated).

15 May 2011

3. Country:

The official (short) version of the country name.

Bangladesh

(The Peoples Republic of Bangladesh)

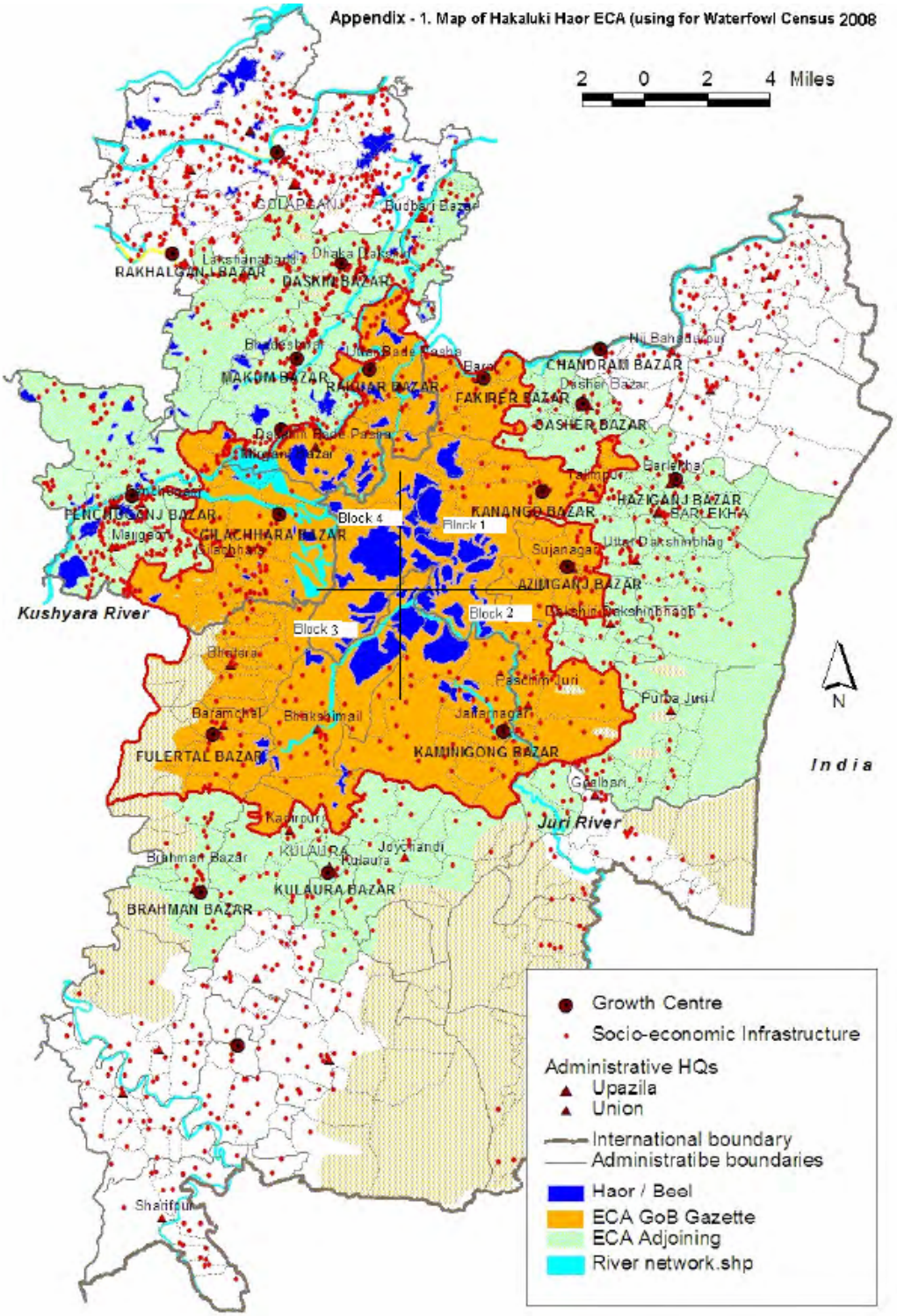
4. Name of the Flyway Network site:

The precise name of the designated site in the national language and English. This name will be used precisely as given on the Site certificate. Alternative names, including in local language(s), should be given in parentheses after the precise name.

Hakaluki Haor

5. Map of site:

The most up-to-date available and suitable map of the wetland should be appended to the SIS (in hardcopy and, if possible, also in digital format). The map must clearly show the boundary of the site.



6. Geographical coordinates (latitude/longitude, in decimal degrees):

Provide the coordinates of the approximate centre of the site and/or the limits of the site. If the site is composed of more than one separate area, provide coordinates for each of these areas.

Hakaluki haor lies between latitude 24° 35' N to 24° 45' N and longitude 92° 00' E to 92° 08' E.

7. Elevation: (in metres: average and/or maximum & minimum)

All water bodies are flat plain. They are the low-lying plain land. Average elevation is 4-5 meter from mean sea level.

8. Area:

The total area of the site, in hectares. If the areas of discrete site units are known, please also list each of these together with the names (or labels) used to identify and differentiate these units.

Hakaluki Haor is made up of more than 238 small, medium and large interconnected beels some of which are perennial and others seasonal. During the dry season the area covered by these beels is approximately 4,400 ha but with the onset of the rains in the summer the entire area floods to about four and half times this size (approximately 18,000 ha) and remains underwater for up to five months.

9. General overview of the site:

A brief summary of the site (limited to not more than two sentences), mentioning principal physical and ecological functions, and its importance for migratory waterbirds.

Hakaluki Haor itself is a complex of more than 80 inter-connecting beels located in the Moulvi Bazar & Sylhet District. The lakes are mainly fed by the Juri, Kan-tinala and Kuiachari Rivers and drain through a single outlet, the Kushiara River. During the rainy season, the entire area floods, and the beels are united as one large lake, or haor, with an area of approximately 18,000 ha. This makes it the largest haor in Bangladesh.

10. Justification of Flyway Site Network criteria:

Please provide waterbird count information that demonstrates that the site meets the criteria of the Flyway Site Network (Annex 1). That is:

- it regularly supports > 20 000 migratory waterbirds; or,
- it regularly supports > 1 % of the individuals in a population of one species or subspecies of migratory waterbird; or,
- it supports appreciable numbers of an endangered or vulnerable population of migratory waterbird
- it is a “staging site” supporting > 5 000 waterbirds, or > 0.25% of a population stage at the site.

A listing of the populations of migratory waterbirds covered by the East Asian – Australasian Flyway Partnership and the 1% thresholds is attached (Annex 3).

The “staging site” criterion is particularly difficult to apply and application of this should be discussed with the Secretariat. Also note that some species have several populations that are very difficult to distinguish in the field.

Hakaluki Haor is a highly significant site for a wide variety of waterfowl, particularly Anatidae, including the globally endangered Baer's Pochard (*Aythya baeri*). Threatened species such as Pallas' Fish Eagle also occurs at the wetland. It is important for wintering migratory shorebirds. In the 1960s, the wintering population of ducks was estimated at between 40,000 and 60,000. In 2007 about 126,851 birds of 41 species have been found in the Hakaluki Haor.

A2

- **"It regularly supports appreciable number of endangered species (i.e. Baer's Pochard *Aythya baeri*)."**

A5

- **"It regularly supports >20,000 waterfowl." (Table 1)**

Table 1. The result of the Asian Waterbird Census (AWC) from 1988 to 2005.

	1988	1989	1990	1991	1992	1993	1994	1995	1996
No. of waterbirds	50,672	30,516	11,443	20,655	37,132	66,442	23,486	18,068	32,145
	1997	1998	1999	2000	2001	2002	2003	2004	2005
No. of waterbirds	n/a	n/a	n/a	n/a	n/a	n/a	26,380	33,783	49,319

Source: Li et al. 2009. Status of Waterbirds in Asia - Results of the Asian Waterbird Census: 1987-2007. Wetlands International.

A6

- **"It regularly supports 1% of the individuals in populations of 10 species or sub-species (i.e. Baer's Pochard)." (Table 2)**

Table 2. The peak count of major waterbirds in the Hakaluki Haors based on the AWC results.

Species	EAAF population	1% of EAAF population	Peak count	Year
Baer's Pochard (*Aythya baeri*)	10,000-20,000	100	800	1996
Great Created Grebe (*Podiceps cristatus*)	25,000-50,000	250	400	1996
Eastern Great Egret (*Ardea modesta*)	10,000-100,000	100	2,152	2005

Fulvous Whistling Duck (*Dendrocygna bicolor*)	**50,000**	**500**	**13,308**	**2005**
Lesser Whistling Duck (*Dendrocygna javanica*)	**100,000-1,000,000**	**1,100**	**18,042**	**2005**
Gadwall (*Anas strepera*)	**500,000-1,000,000**	**5,000**	**6,000**	**1993**
Northern Pintail (*Anas acuta*)	**200,000-300,000**	**2,000**	**36,500**	**1993**
Northern Shoveler (*Anas clypeata*)	**500,000**	**5,000**	**9,379**	**1992**
Ferruginous Duck (*Aythya nyroca*)	**100,000**	**1,000**	**5,850**	**2003**
Grey-headed Lapwing (*Vanellus cinereus*)	**25,000-100,000**	**250**	**1,084**	**1990**

(Source: Li et al. 2009. Status of Waterbirds in Asia - Results of the Asian Waterbird Census: 1987-2007. Wetlands International.)

11. Wetland Types:

List the wetland types present (see Annex 2). List the wetland types in order of their area in the Flyway Network site, starting with the wetland type with the largest area.

O, P, Xf

12. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Ministry of Agriculture/Dept. of Environment.

All wetlands are government property controlled by Ministry of land. Ministry of Fisheries & Department of Environment are also included for the managing the water bodies as maximum haors are included under ECAs (Ecologically Critical Areas). Hakaluki Haor consists of Kulaura, Barolekha & Juri upazilla of Moulovibazar district and fenchuganj & Golapganj upazilla of Sylhet district, Bangladesh.

13. Management authority:

Provide the name and address of the local office(s) of the agency (ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Hakaluki Haor is Managed by District Land Administration, Moulovibazar; District Land Administration, Sylhet; Department of Environment (DoE) as it is a Ecologically Critically Area (ECA) and Participation of local communities (ECA CC Comittee); Forest Department is responsible for Wildlife Conservation. The Bangladesh Haor Development Board under Ministry of Water Resources is responsible for water management and water control infrastructure.

Department of Fisheries under the Ministry of Fisheries and Livestock is responsible for fishery resources management as well as, to some extent, management of wetlands.

14. Bibliographical references:

A list of key technical references relevant to the wetland, including management plans, major scientific reports, and bibliographies, if such exist. Please list any functional/active Web site addresses dedicated to the site or which prominently feature the site, and include the date that the Web site was most recently updated. When a large body of published material is available about the site, only the most important references need be cited, with priority being given to recent literature containing extensive bibliographies.

1. **Jamal Anwar**, "Migratory and other Birds in Bangladesh in Danger" (http://www.sos-arsenic.net/english/homegarden/loving_birds.html)
2. **M Aminul Islam**, Ecologically Critical Area, *Banglapedia: The national encyclopedia of Bangladesh*; Asiatic Society of Bangladesh, Dhaka (http://www.banglapedia.org/httpdocs/HT/E_0017.HTM)
3. **Nishat, A., Huq, S.M., Barua, I., Reza, S., Ali, A.H.M. Moniruzzaman, K.A.S.** 2002. *Bioecological zones of Bangladesh*. IUCN-The World Conservation Union, Bangladesh Country Office, Dhaka.
4. **Ahmed, I., Deaton, B.J., Sarker, R. and Virani, T.** 2008. Wetland ownership and management in a common property resource setting: A case study of Hakaluki Haor in Bangladesh.
5. **Karim, A.** 1993. Plant diversity and their conservation in freshwater wetlands. In: *Freshwater Wetlands in Bangladesh – Issues and Approaches for Management*. Eds. Nishat, A., Hussain, Z., Roy, M.K. and Karim, A., IUCN, Gland, Switzerland.
6. **Nishat, A.** 1993. Freshwater wetlands in Bangladesh: Status and issues. In: *Freshwater Wetlands in Bangladesh – Issues and Approaches for Management*. Eds. Nishat, A., Hussain, Z., Roy, M.K. and Karim, A., IUCN, Gland, Switzerland.
7. **Coastal and Wetland Biodiversity Management Project Document.** 2006. Ministry of Environment and Forests, Government of Bangladesh, Prepared & Submitted by: IUCN-Bangladesh. In association with Center for Natural Resource Studies.
8. **CNRS (Centre for Natural Resource Study).** 2002. *Bio-physical characteristics of Hakaluki Haor.*

9. **Coastal and Wetland Biodiversity Management Project Document (CWBMP).** 2005. *Hakaluki Haor Management Plan (Draft).* Prepared & Submitted by: IUCN-Bangladesh. In association with Center for Natural Resource Studies.
10. **Khan, M.S., Haq, E., Huq, S., Rahman, A.A., Rashid, S.M.A. and Ahmed, H.** 2004. *Wetlands of Bangladesh.* Bangladesh Centre for Advanced Studies in associated with Nature Conservation Movement, Dhanmondi, Dhaka-1209, Bangladesh.
11. **Choudhury, J.K. and Faisal, A.M.** 2005. *Plant Resources of Haors and Floodplains*; *An O*verview.IUCN-The World Conservation Union. Bangladesh Country office, Dhaka.
12. **CWBMP (Coastal and Wetland Biodiversity Management Project).** 2004. *Plant Biodiversity.*Department of Environment. Government of the People's Republic of Bangladesh.
13. **Chowdhury, M.A.K.** 2001. Changes in mangrove forest soils: a comparison between cultured and naturally inundated conditions. *Wetlands Ecol. Manag.*
14. **Islam, M.S.** 2003. Perspectives of the coastal and marine fisheries of the Bay of Bengal, Bangladesh. *Ocean Coastal Manag.*
15. **Chowdhury, Q., Rashid, A.Z.M.M. and Afrad, M.** 2004. Socio-Economic Significance of Reed Forests in a Rural Community: A Case Study from the Greater Sylhet Region of Bangladesh. *Small-scale Forest Economics, Management and Policy* .
16. **Iftekhar, M.S. and Islam, M.R.** 2004. Managing mangroves in Bangladesh: A strategy analysis. *J. Coastal Conserv.*
17. **Islam, M.S. and Haque, M.** 2004. The mangrove based coastal and near shore fisheries of Bangladesh: ecology, exploitation and management. *Reviews Fish Biol.*
18. **Islam, M.S. and Wahab, M.A.** 2005. A review on the present status and management of mangrove wetland habitat resources in Bangladesh with emphasis on mangrove fisheries and aquaculture.
19. **Gopal, B. and Chauhan, M.** 2006. Biodiversity and its conservation in the Sundarban Mangrove Ecosystem.
20. **Hoq, M.E., Wahab, M.A. and Islam, M.N.** 2006. Hydrographic status of Sundarbans mangrove, Bangladesh with special reference to post-larvae and juveniles fish and shrimp abundance.
21. **Hoque, M.A., Sarkar, M.S.K.A., Khan, S.A.K.U., Moral, M.A.H. and Khurram, A.K.M.** 2006. Present Status of Salinity Rise in Sundarbans Area and its Effect on Sundari (*Heritiera fomes*) Species.
22. **Hoq, M.E.** 2007. An analysis of fisheries exploitation and management practices in Sundarbans mangrove ecosystem, Bangladesh.
23. **Iftekhar, M.S. and Saenger, P.** 2008. Vegetation dynamics in the Bangladesh Sundarbans mangroves: a review of forest inventories.

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27. **Khan, M.S., Haq, E., Huq, S., Rahman, A.A., Rashid, S.M.A. and Ahmed, H.** 2009. *Wetlands of Bangladesh*. Ministry of Environment and Forests, Peoples Republic of Bangladesh, Dhaka, Bangladesh.
28. **Khan, M.I. and Islam, M.A.** 2005. *Poverty Status of a Critical Wetland Area: Hakaluki Haor 2005*. Published by IUCN, Dhaka, Bangladesh.
29. **IUCN .** 2006. *Inception Report: Economic Evaluation of Hakaluki Haor*, Published by IUCN, Dhaka, Bangladesh.
30. **K abii, T.** 1996. An overview of African wetlands. In: *Wetlands, biodiversity and the Ramsar convention.* Ed. Hails, A.J., Ramsar Convention Bureau, Gland, Switzerland
31. **I slam, M.A., Chowdhury, N.K. and Haque, M.R.** 2005. *Socio-Economic Baseline Survey of Pagnar and Sanuar – Dakuar Haors*, Bangladesh: Published by IUCN, Dhaka, Bangladesh

Part 2 – Optional

15. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Hakaluki Haor itself is a complex of more than 80 inter-connecting beels located in the Moulvi Bazar and Sylhet District. The lakes are mainly fed by the Juri, Kan-tinala and Kuiachari Rivers and drain through a single outlet, the Kushiara River. During the dry sea-son, the beels cover an area of approximately 4,400 ha. This 18,000 ha is defined as the area of the ECA declared for Hakaluki Haor.

16. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, and climate (including climate type).

Hills of Assam and Tripura, India.

17. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

Navigation, Irrigation for the paddy fields of the neighboring areas.

18. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Flyway Network site, and the ecosystem services of the site and the benefits derived from them.

Hakaluki Haor itself is a complex of more than 80 inter-connecting beels located in the Moulvi Bazar District. The lakes are mainly fed by the Juri, Kan-tinala and Kuiachari Rivers and drain through a single outlet, the Kushiara River.

19. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the SIS.*

(Please add here the species which do not comes under sec no 14)

Wetland vegetation in Bangladesh is represented by a total of 158 species. The Hakaluki Haor system supports at least 73 of these species, or nearly half of the national total. These include 65 obligate hydrophytes. The open water aquatic vegetation consists of submerged, free floating, rooted floating and a number of emergent plants.

The Haor system at one time supported dense communities of trees forming swamp forests consisting of *Barringtonia acutangula*, *Pongamia pinnata*, *Crataeva nurvala*, *Trewia nudiflora* and *Salix tetrasperma*. Associated with these at the edges of the water bodies were thick spiny bushes of wild rose *Rosa clinophylla*, and scrub *Lippia javanica*, *Ficus heterophylla* and *Phyllanthus disticha*.

20. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 10. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the SIS.*

(Please add here the species which do not comes under sec no 14)

Apart from the waterfowl, mammals and reptiles known to occur in the area include Fishing Cat and *Lutra lutra*, *L. perspicillata*, *Canis aureus*, *Vulpes bengalensis*, *Herpestes* spp, the cobra *Naja naja* and a variety of water snakes, freshwater turtle and tortoises.

21. Social and cultural values:

a) Describe if the site has any general social and/or cultural values e.g., fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values:

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning?

Describe this importance under one or more of the following categories:

i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:

ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:

iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:

iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

The aim of the management of the wetland is to protect and restore aquatic biodiversity particularly fish and birds in Hakaluki Haor. A secondary aim is through the visitor facilities to enhance enjoyment of the site and understanding of nature, the value of wetlands and need for their conservation.

22. Land tenure/ownership:

a) within the Flyway Network site:

All the wetlands are owned by the Ministry of Land Bangladesh.

b) in the surrounding area:

Private homesteads and paddy land.

23. Current land (including water) use:

a) within the Flyway Network site:

Currently it is leased by District administration for fishing.

b) in the surroundings/catchment:

The neighbouring inhabitants are dependent on it for their irrigation and cattle grazing..

24. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

a) within the Flyway Network site:

b) in the surrounding area:

25. Conservation measures taken:

a) List national and/or international category and legal status of protected areas, including boundary relationships with the Flyway Network site:

In particular, if the site is partly or wholly a World Heritage Site and/or a UNESCO Biosphere Reserve, please give the names of the site under these designations.

b) If appropriate, list the IUCN (1994) protected areas category/ies which apply to the site (tick the box or boxes as appropriate):

Ia ❑; Ib ❑; II ❑; III ❑; IV ❑; V ❑; VI ❑

c) Does an officially approved management plan exist; and is it being implemented?:

d) Describe any other current management practices:

A special project is operating to conserve the natural resources through co-management under Ministry of Environment and Forest. Department of Environment provides the technical leadership of the project. This is an Ecologically Critical Area (ECA) due to its ecological value.

26. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

It is declared as an ECA and all sorts of fishing and other illegal activities will be stopped.

27. Current scientific research and facilities:

e.g., details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Information on 2010 and 2011 activities focussed on AI surveillance and migratory waterbird migration research undertaken jointly by the Forest Department, Wildlife Trust of Bangladesh, FAO, USGS, BNHS, Wetlands International, ICDDR,B could be included here – these have helped to provide important information on the local and international migratory routes of the waterbirds marked with PTTs using this area.

28. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitors' centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

On going project in the haor basin is communicating and educating people dependent on the natural resources of the haor as well as creating mass awareness to conserve the haor resources.

29. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Due to its scenic beauty and nature, it attracts large number of tourists to visit Hakaluki Haor every year particularly in the winter months.

Annex 1: Criteria for the inclusion of sites in the Flyway Site Network

(from the Partnership Text)

To be considered for inclusion in the Flyway Site Network, this Partnership adopts the following criteria:

a. Convention on Wetlands (Ramsar, Iran, 1971) criteria for internationally important sites for migratory waterbirds. That is:

   Criterion 2: A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.

   Criterion 5: A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds.

   Criterion 6: A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.

b. The staging criteria as applied under the Asia - Pacific Migratory Waterbird Conservation Strategy. That is:

   i. A staging site should be considered internationally important if it regularly supports 0.25% of individuals in a population of one species or subspecies of waterbirds on migration.

   ii. A staging site should be considered internationally important if it regularly supports 5,000 or more waterbirds at one time during migration.

c. Under exceptional circumstances a site can be nominated if it supports migratory waterbirds at a level or stage of their life cycle important to the maintenance of flyway populations. Justification of such nominations will be considered by the Partnership on a case by case basis.

Annex 2: Ramsar Classification System for Wetland Type

The codes are based upon the Ramsar Classification System for Wetland Type as approved by Recommendation 4.7 and amended by Resolutions VI.5 and VII.11 of the Conference of the Contracting Parties. The categories listed herein are intended to provide only a very broad framework to aid rapid identification of the main wetland habitats represented at each site.

To assist in identification of the correct Wetland Types to list in section 19 of the RIS, the Secretariat has provided below tabulations for Marine/Coastal Wetlands and Inland Wetlands of some of the characteristics of each Wetland Type.

Marine/Coastal Wetlands

A -- **Permanent shallow marine waters** in most cases less than six metres deep at low tide; includes sea bays and straits.
B -- **Marine subtidal aquatic beds**; includes kelp beds, sea-grass beds, tropical marine meadows.
C -- **Coral reefs**.
D -- **Rocky marine shores**; includes rocky offshore islands, sea cliffs.
E -- **Sand, shingle or pebble shores**; includes sand bars, spits and sandy islets; includes dune systems and humid dune slacks.
F -- **Estuarine waters**; permanent water of estuaries and estuarine systems of deltas.
G -- **Intertidal mud, sand or salt flats**.
H -- **Intertidal marshes**; includes salt marshes, salt meadows, saltings, raised salt marshes; includes tidal brackish and freshwater marshes.
I -- **Intertidal forested wetlands**; includes mangrove swamps, nipah swamps and tidal freshwater swamp forests.
J -- **Coastal brackish/saline lagoons**; brackish to saline lagoons with at least one relatively narrow connection to the sea.
K -- **Coastal freshwater lagoons**; includes freshwater delta lagoons.
Zk(a) – **Karst and other subterranean hydrological systems**, marine/coastal

Inland Wetlands

L -- **Permanent inland deltas**.
M -- **Permanent rivers/streams/creeks**; includes waterfalls.
N -- **Seasonal/intermittent/irregular rivers/streams/creeks**.
O -- **Permanent freshwater lakes** (over 8 ha); includes large oxbow lakes.
P -- **Seasonal/intermittent freshwater lakes** (over 8 ha); includes floodplain lakes.
Q -- **Permanent saline/brackish/alkaline lakes**.
R -- **Seasonal/intermittent saline/brackish/alkaline lakes and flats**.
Sp -- **Permanent saline/brackish/alkaline marshes/pools**.

Ss -- **Seasonal/intermittent saline/brackish/alkaline marshes/pools**.

Tp -- **Permanent freshwater marshes/pools**; ponds (below 8 ha), marshes and swamps on inorganic soils; with emergent vegetation water-logged for at least most of the growing season.

Ts -- **Seasonal/intermittent freshwater marshes/pools on inorganic soils**; includes sloughs, potholes, seasonally flooded meadows, sedge marshes.

U -- **Non-forested peatlands**; includes shrub or open bogs, swamps, fens.

Va -- **Alpine wetlands**; includes alpine meadows, temporary waters from snowmelt.

Vt -- **Tundra wetlands**; includes tundra pools, temporary waters from snowmelt.

W -- **Shrub-dominated wetlands**; shrub swamps, shrub-dominated freshwater marshes, shrub carr, alder thicket on inorganic soils.

Xf -- **Freshwater, tree-dominated wetlands**; includes freshwater swamp forests, seasonally flooded forests, wooded swamps on inorganic soils.

Xp -- **Forested peatlands**; peatswamp forests.

Y -- **Freshwater springs; oases**.

Zg -- **Geothermal wetlands**

Zk(b) – **Karst and other subterranean hydrological systems**, inland

Note: "**floodplain**" is a broad term used to refer to one or more wetland types, which may include examples from the R, Ss, Ts, W, Xf, Xp, or other wetland types. Some examples of floodplain wetlands are seasonally inundated grassland (including natural wet meadows), shrublands, woodlands and forests. Floodplain wetlands are not listed as a specific wetland type herein.

Human-made wetlands

1 -- **Aquaculture** (e.g., fish/shrimp) **ponds**

2 -- **Ponds**; includes farm ponds, stock ponds, small tanks; (generally below 8 ha).

3 -- **Irrigated land**; includes irrigation channels and rice fields.

4 -- **Seasonally flooded agricultural land** (including intensively managed or grazed wet meadow or pasture).

5 -- **Salt exploitation sites**; salt pans, salines, etc.

6 -- **Water storage areas**; reservoirs/barrages/dams/impoundments (generally over 8 ha).

7 -- **Excavations**; gravel/brick/clay pits; borrow pits, mining pools.

8 -- **Wastewater treatment areas**; sewage farms, settling ponds, oxidation basins, etc.

9 -- **Canals and drainage channels, ditches.**

Zk(c) -- **Karst and other subterranean hydrological systems**, human-made