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Indus River Dolphin

(Platanista gangetica minor) :

Status and Conservation in Punjab (India)

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EDITORIAL

Dolphins are among the planet's most well known marine mammal. When we hear the word 'dolphin', what comes to mind is the endearing, intelligent bottlenose dolphin shown in movies and television shows. Though we often make the mistake of believing that there is only one kind of dolphin, there exist over 30 different types of dolphins, and including the river dolphins and porpoises, there are over 40 types of dolphins. To be precise, there are 32 types of oceanic dolphins, 5 species of river dolphins and 6 types of porpoises.

Dolphins are important to the ecosystem in the sense that they are apex or top-level predators which control populations of fishes and squids and keep the ecosystem balance. They are the migratory species susceptible to a wide range of threats, including habitat shrinkage in breeding areas, excessive hunting along migration routes, and degradation of their feeding grounds. As a result of international concern over these threats, a UN Convention on the Conservation of Migratory (CMS) Species of Wild Animals, also known as Bonn Convention was adopted in 1979 and entered into force on 1st November 1983, to protect dolphins along their migration routes between their feeding and breeding grounds. Bonn Convention is a unique global advocate of reducing threats to their survival as well as to the ocean and river waters where they live.

In India, we have three river dolphin species, first it's the Ganges river dolphin *(Platanista gangetica)*, the distribution range of the Ganges River Dolphins in India covers seven states namely, Assam, Uttar Pradesh, Madhya Pradesh, Rajasthan, Bihar, Jharkhand and West Bengal. The Upper Ganga River (in Uttar Pradesh), Chambal River (Madhya Pradesh and Uttar Pradesh), Ghaghra and Gandak Rivers (Bihar and Uttar Pradesh), Ganga River, from Varanasi to Patna (Uttar Pradesh and Bihar), Sone and Kosi rivers (Bihar), Brahmaputra from Sadia (foothills of Arunachal Pradesh) upto Dhubri (on the Bangladesh Border) and Kulsi River, a tributary of the Brahmaputra river, form ideal habitats for the Ganges River Dolphin. The Ganga River Dolphin was declared the National Aquatic Animal of India by the National Ganga River Basin Authority which is chaired by the Prime Minister. The Gangetic River Dolphins, are being conserved in the first dolphin research centre and protected area at Vikramshila Gangetic Dolphin Sanctuary (VGDS) in Patna, Bihar.

Then there is Irrawaddy dolphin (Orcaella brevirostris) of Chilika Lake, Odisha designated a Ramsar site for its rich biodiversity, is a wetland of international importance for migratory birds and also home to the only known population of Irrawaddy dolphins.

The third and recently sighted species of river dolphin is of Indus River dolphin (*Platanista gangetica minor*). Which was has been reported from Punjab (India) in 2007 between Beas city and Harike Barrage and is believed to be the only surviving Indus River dolphin population in India. Both, the dolphins and humans need healthy river for their sustenance. Hence, the protection of dolphins and the welfare of the people are two sides of the same coin, and are very much interrelated. By highlighting their plight, the present article seeks to educate and promote the conservation efforts in place to help preserve the waters where the dolphins live so that they can continue to survive.

Introduction

Aquatic mammals are generally grouped in three orders namely i) Cetacea ii) Sirenia and iii) Pinnipedia. Order Cetacea includes aquatic mammals like whales, dolphins and porpoises **(Chart 1 & Fig. 1)**. The second order Sirenia includes aquatic mammals such as sea cows and manatees. The third order, Pinnipedia includes mammals like seals, sea lions and walruses.

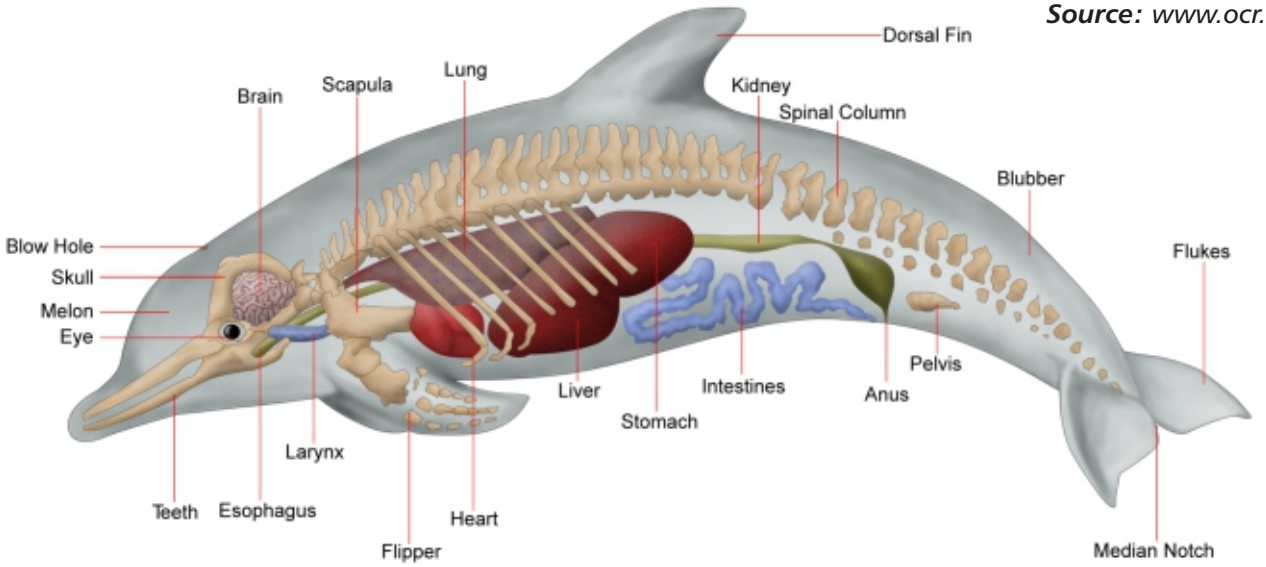
These aquatic mammals mostly give an appearance exactly like fishes. Therefore, common people talk of whales as whale fish, porpoises as porpoise fish and dolphins as dolphin fish. But biologically these are not at all fishes. **Box 1** gives brief detail about the dolphin in terms of their morphology and physiology. Main differences between aquatic mammals and fishes are as shown in **Box 2**.

Box 1. Dolphin

Dolphins comprise the largest family of the cetaceans, with over forty species within some 17 genera varying in size from 1.2 m (4 ft) and 40 kg (90 lb) for the Maui's dolphin *(Cephalorhynchus hectrori maui)*, up to 9.5 m (30 ft) and 10 tonnes - the orca (Orcinus orca). They are found worldwide, mostly in the shallower seas of the continental shelves. They are carnivores, eating mostly fish and squid. Most dolphins have acute eyesight, both in and out of the water, and they can hear frequencies ten times or more above the upper limit of adult human hearing. Though they have a small ear opening on each side of their head, it is believed hearing underwater is also, if not exclusively, done with the lower jaw, which conducts sound to the middle ear via a fat-filled cavity in the lower jaw bone. Hearing is also used for echolocation, which all dolphins have. Dolphin teeth are believed to function as antennae to receive incoming sound and to pinpoint the exact location of an object. Beyond locating an object, echolocation (biological sonar) also provides the animal with an idea on the object's shape and size, though how exactly this works is not yet understood. The Indus Dolphin is effectively blind. This may be because not much light penetrates the waters of the Indus river (due to suspended sediments), making the need for vision unnecessary.

Dolphins frequently leap above the water surface, Dolphins are often regarded as one of Earth's most intelligent animals, though it is hard to say just how intelligent. Dolphins are social, living in pods of up to a dozen individuals. When travelling, jumping can save the dolphin energy as there is less friction while in the air. This type of travel is known as porpoising.

Source: *www.ocr.org*



Anatomy of a Dolphin *(Delphinidae)*

Chart 1. Classification of Order Cetacea

The tables below represent the list of scientific and common names accepted by the International Whaling Commission's Scientific Committee.

Order : Cetacea	
Suborder: Odontoceti (toothed whales or odontocetes)	Suborder: Mysticeti (baleen whales or mysticeti)

Suborder Odontoceti (toothed whales or odontocetes)

Family	Scientific name
Physeteridae	*Physeter macrocephalus*
Kogiidae	*Kogia breviceps ; Kogia sima*
Platanistidae	*Platanista gangetica ; Platanista gangetica minor*
Pontoporiidae	*Pontoporia blainvillei*
Lipotidae	*Lipotes vexillifer*
Iniidae	*Inia geoffrensis*
Monodontidae	*Delphinapterus leucas; Monodon monoceros*
Phocoenidae	*Phocoena phocoena; Phocoena spinipinnis Phocoena sinus; Phocoena dioptrica; Neophocaena phocaenoides; Phocoenoides dalli*
Delphinidae	*Steno bredanensis; Sousa chinensis Sousa teuszii; Sotalia fluviatilis; Sotalia guianensis; Lagenorhynchus albirostris Lagenorhynchus acutus; Lagenorhynchus obscurus; Lagenorhynchus obliquidens, Lagenorhynchus cruciger; Lagenorhynchus , australis; Grampus griseus; Tursiops truncatus, Tursiops aduncus; Stenella frontalis; Stenella attenuata; Stenella longirostris; Stenella clymene; Stenella coeruleoalba; Delphinus delphis; Delphinus capensis; Lagenodelphis hosei; Lissodelphis borealis; Lissodelphis peronii; Cephalorhynchus commersonii; Cephalorhynchus eutropia; Cephalorhynchus heavisidii; Cephalorhynchus hectori; Peponocephala electra; Feresa attenuata; Pseudorca crassidens, Orcinus orca; Globicephala melas; Globicephala macrorhynchus; Orcaella brevirostris; Orcaella heinsohni*
Ziphiidae	*Tasmacetus shepherdi; Berardius bairdii; Berardius arnuxii; Indopacetus pacificus; Mesoplodon bidens; Mesoplodon densirostris; Mesoplodon europaeus; Mesoplodon layardii; Mesoplodon hectori; Mesoplodon grayi; Mesoplodon stejnegeri; Mesoplodon bowdoini; Mesoplodon mirus; Mesoplodon ginkgodens; Mesoplodon carlhubbsi; Mesoplodon perrini; Mesoplodon peruvianus; Mesoplodon traversii; Ziphius cavirostris; Hyperoodon ampullatus, Hyperoodon planifrons*

Source : *International Whaling Commission*

Fig. 1. Family : Delphinidae

Delphinus delphis

Delphinus capensis

River dolphins and porpoises occur only in Asia and South America. In the past, because of their similar habitat and external appearance all the obligate river dolphins were classified together into a single Superfamily, the Platanistoidea. Recent genetic studies have clearly shown that they are in fact not closely related at all, but each belong to a separate family (Hamilton et al. 2001). It is now believed that quite different aquatic cetacean ancestors colonised rivers in different geographic locations, and at different times during evolution. However, the one thing that they do have in common is their freshwater distribution that has placed them in close proximity to humans. Although the specific threats and factors driving their decline vary geographically, almost all the river dolphins are threatened leading to their extinction (IUCN 2011).

There are 44 different types of dolphins, mostly marine; however, one group of dolphins, the family Platanistidae or river dolphins, lives mainly in the fresh water of rivers. There are seven species of river dolphins **(Fig. 2 & Table-1)**.

The Ganges River dolphin *(Platanista gangetica gangetica)* and the Indus River dolphin *(Platanista gangetica minor)* are obligate freshwater river dolphins found in India while Irrawaddy dolphin *(Orcaella brevirostris)* is not a true freshwater dolphin, it is primarily found in Southeast Asian estuaries and mangrove areas, with few freshwater populations occurring in river systems. The Indus and Ganges populations were long regarded as identical until Pilleri and Gihr (1971) divided them into two species *(P. gangetica* and *P. minor)*, but Kasuya (1972) reduced the two taxa to subspecies of a single species *(P. gangetica)*.

Box 2. Differences between Aquatic Mammals and Fishes

Aquatic Mammals	Fishes
Mammals give birth to live young.	Fishes lay eggs.
Marine mammals swim by moving their tail up and down.	Fishes swim by moving their tail from side to side.
Many mammals usually have hair.	Fishes have scales.
Marine mammals do not have gills. They have lungs and they have to come to the surface to breathe.	Fishes have gills so they can breathe underwater.
Marine mammals are warm-blooded animals.	Fishes are cold-blooded animals.

Source: *www.ucsb.edu*

Table 1: Types of River Dolphins

Common name	Scientific name	Brief Note
Amazon river dolphin	*Inia geoffrensis*	Also known as the pink river dolphin or boto, can only live in freshwater. It is found throughout much of the Amazon and Orinoco River Basins in Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, and Venezuela. It is the most abundant freshwater cetacean and probably numbers in tens of thousands. However, it is classified as Vulnerable, with several dams having already fragmented its population.
Yangtze river dolphin	*Lipotes vexillifer*	Yangtze river dolphin, or baiji can only live in freshwater. It once lived in the lower and middle reaches of the Yangtze River, Fuchun River, and in Dongting and Poyang lakes of China. Today it is the world's most endangered cetacean, with fewer than 100 surviving in the middle reaches of the Yangtze. IUCN has assigned it critically endangered status.
Guianian river dolphin	*Sotalia fluviatilis*	The riverine and marine forms of Sotalia were recently split into two species: *S. fluviatilis* in the Amazon and *S. guianensis* in marine and estuarine waters of eastern South and Central America and the Caribbean (IUCN, 2013). *S. fluviatilis* is most strikingly & specially colored dolphins from steel grey to a sandy brown and from purple to their most common color bluish grey with pinkish belly & sides. Classified as Data Deficient, its population is not known but it is not thought to be immediately threatened.
Irrawaddy dolphin	*Orcaella brevirostris*	Irrawaddy dolphins have a discontinuous distribution in the tropical and subtropical Indo-Pacific, almost exclusively in estuarine and fresh waters. They occur from Borneo and the central islands of the Indonesian Archipelago north to Palawan, Philippines, and west to the Bay of Bengal, including the Gulf of Thailand. There are freshwater subpopulations in three large rivers: Ayeyarwady (up to 1,400 km upstream) in Myanmar, Mahakam (up to 560 km upstream) in Indonesia, and Mekong (up to 690 km upstream) in Vietnam, Cambodia and Lao, and two marine-appended brackish water bodies or lakes: Chilika in India and Songkhla in Thailand. The fine-scale range of the species is poorly documented throughout much of its range in estuarine waters (IUCN, 2013)
Ganges river dolphin	*Platanista gangetica*	Locally called susu or shushuk, can only live in freshwater and is essentially blind. It once ranged throughout the Ganges-Brahmaputra-Meghna and Karnaphuli-Sangu river systems of Nepal, India, and Bangladesh, from the Himalayan foothills to the Bay of Bengal. Today its population is divided by dams into isolated groups and has a much reduced range. The lowest estimate for the total population is 1,200–1,800 individuals.
Indus river dolphin	*Platanista gangetica minor*	Closely related to the Ganges river dolphin, the Endangered Indus river dolphin, or bhulan, is found in Pakistan's Indus river and in 2007 it has been sighted in Beas river at Harike wetland, Punjab.
Finless porpoise	*Neophocaena Phocaenoides*	It is the only porpoise species that can live in freshwater, with a sub-species, *N.p. asiaeorpientalis,* found in the Yantze River and its adjacent lake systems. Classified as Endangered, a 2006 survey estimated the population of this freshwater sub-species to be 1,200-1,400.

Source: *www.wwf.org.au*

Fig. 2. Types of River Dolphin

Inia geoffrensis

Lipotes vexillifer

Sotalia fluviatilis

Orcaella brevirostris

Platanista gangetica

Platanista gangetica minor

Box 3. Interesting Facts about the Indus River Dolphin

- The Indus River Dolphin is only found in India and Pakistan.
- The eyes of the Indus River dolphin can only differentiate between light and dark, therefore they use echolocation to navigate. Sound pulses, emitted by the dolphins, reflect off objects in the water and are then received by sonar receptors in the head and lower jaw. This highly developed Bio-sonar system is used to navigate, locate prey and communicate with other dolphins.
- Indus Dolphin has a side-swimming behavior; they feel the bottom of the river with the help of nerve endings at the edges of their flippers.
- According to a folkfore, the Indus River Dolphin was once a woman who was cursed to become a dolphin and to live in the river forever.
- Indus River dolphins have very small eyes that resemble pinhole openings. Some scientists believe they are functionally blind, sensing only light levels and direction.
- They vocalize almost constantly, emitting trains of high frequency (15-150 kHz) echolocation clicks.
- When surfacing to breathe, these dolphins make a sound similar to a sneeze.

Source: *World Wide Fund*

The species and both subspecies are listed as Endangered in the IUCN Red List. The Indus River dolphin **(Box 3)** occurs in the Indus River system in Pakistan and India. The species *(Platanista gangetica)* and both its subspecies are classified as endangered by the IUCN World Conservation Union (Smith and Braulik, 2008). Both South Asian River dolphins are among the world's most endangered dolphins, and are listed as mammals of very high conservation priority due to their evolutionarily distinctiveness and threatened status (Isaac et al. 2007). The Ganga River dolphin is being conserved at the world first sanctuary "Vikramshila Gangetic Dolphin Sanctuary" in Patna, Bihar, India **(Box 4)**.

The Indus River dolphin was found in approximately 3400 km of Indus River and its tributaries, from the foothills of Himalayas to the limits of tidal zone in Pakistan (Braulik, 2006). The continuum of its distribution has been wrecked into small fragmented sub-populations.

One such population was reported from Punjab (India) in 2007 between Beas city (31°30'30.5"N, 75°18'2.5"E) and Harike Barrage (31°9'6.8"N, 75°57.8'6.5"E) and is believed to be the only surviving Indus River dolphin population in India (Behera et al, 2008).

Distribution Range : Indus River dolphin

Platanista gangetica minor is considered endemic to Indus River system. Indus River rises in Tibet, flows through North West India and enters Pakistan in the north, flowing for the entire length of the country to the Arabian Sea **(Map 1)**. The Indus River has five main tributaries; namely Jhelum, Sutlej, Chenab, Ravi and Beas Rivers **(Map 2)**. Before 2007, Indus Rive Dolphin was thought to be surviving in the Indus River system of Pakistan only.

The former range of the Indus dolphin became gradually more and more fragmented over time, following partition of British India in 1947, the Indus Waters Treaty of 1960 allocated water in the Ravi, Beas and Sutlej Rivers to India and the Indus, Chenab and Jhelum Rivers to Pakistan.

Box 4. Vikramshila Gangetic Dolphin Sanctuary, Bihar, India

Vikramshila Biodiversity Research & Education Center, under Bhagalpur University, India in collaboration with Whale & Dolphin Conservation Society initiated a project in 2001 that has been focused towards conserving Ganges river dolphins and other threatened aquatic wildlife in the Vikramshila Gangetic Dolphin Sanctuary (VGDS) located in Bhagalpur district of Bihar in India.

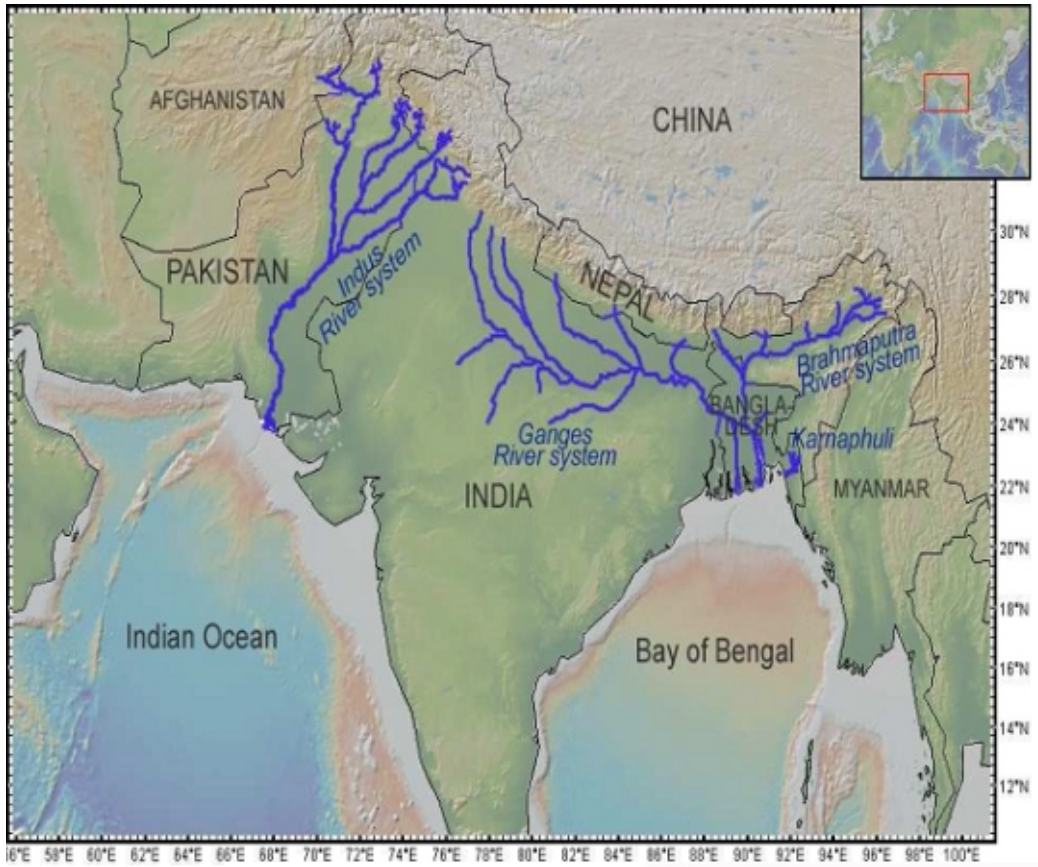
It is the only protected area established in the world for protection and conservation of the Ganges river dolphins, an endangered necessitated freshwater cetacean species endemic to the Ganges and Brahmaputra river systems in India. In addition to supporting a relatively high density of dolphins, the Sanctuary also supports a rich diversity of other wildlife, many of which are threatened with extinction.Once found easily in Ganga, today only 1500 Gangetic dolphins are left in the world. The half of them can be found at the Vikramshila Gangetic Dolphin Sanctuary, which is The sanctuary is a 50km stretch of the river Ganga from Sultanganj to Kahalgaon. Gangetic Dolphins are the major attraction of the sanctuary. There are plenty of other wildlife too at the Vikramshila. with several species of freshwater turtles, waterfowl, otter and Gavialis gangeticus in the sanctuary. The best time to visit Vikramshila Sanctuary is June and October. There is plenty of dolphin sightings during this period.

Various conservation works going on the Sanctuary Area. Noted works are:

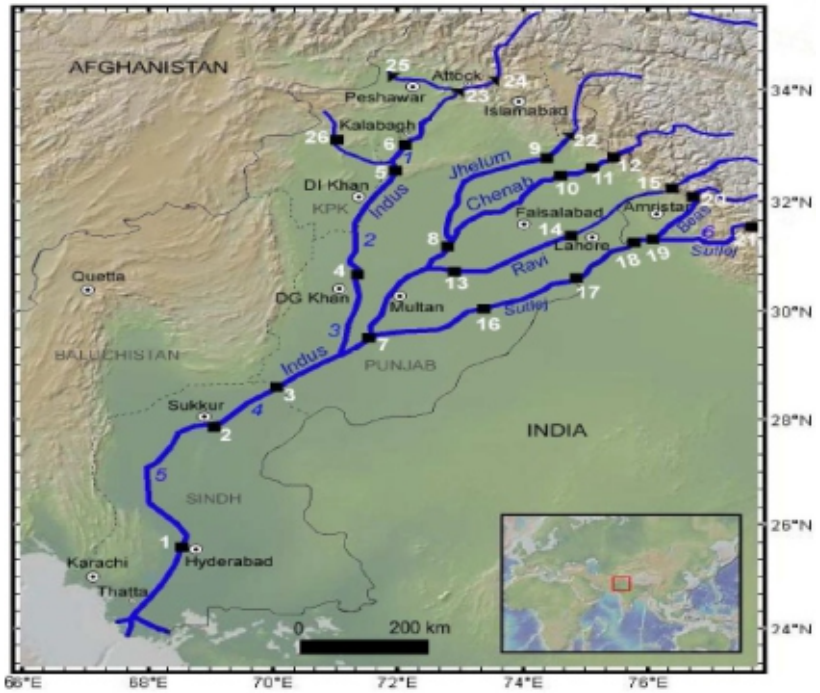
- The Vikramshila Biodiversity Research and Education Centre (VBREC), led by Dr. Sunil Chaudhary, together with the Whale and Dolphin Conservation Society (WDCS), the Environmental Biology Laboratory of Patna University, and T.M. Bhagalpur University, has initiated a project to improve the conservation value of Vikramshila Gangetic Dolphin Sanctuary.
- Aaranyak, a registered conservation NGO working in North East India since 1989, has initiated a project entitled "Conservation of Gangetic dolphin in Brahmaputra river system, India" in collaboration with Dibrugarh University (Assam). The project aims to evaluate the conservation status of the Ganges River dolphin throughout the entire Brahmaputra river system by carrying out research into the species' population status, distribution, habitat preferences and threats.
- WWF India also had started The Dolphin Conservation Programme to conserve the habitat of the Ganges River Dolphin and secure a future for the endangered species.
- Awareness activities by Centre for Environment Education (CEE) with support from Ministry of Environment and Forests (MoEF) initiated a 2-year long project in July 2010 focusing on conservation education programme on Ganges river dolphin in the north, eastern and north eastern region of India. Based on interactions with experts and literature research, CEE team selected total 20 locations in 4 States (Assam, Bihar, Uttar Pradesh and West Bengal) around Ganga and Brahmaputra river system to implement the dolphin conservation awareness programme. On each location a cluster of 25-30 schools was formed to conduct the activities in the area. A local partner agency was also chosen to work with schools and conduct the awareness and education activities. Educational material on river dolphin was developed in four languages to reach out wide target group in project locations. Each dolphin school conducted various activities with the help of material and concluded their activities with Dolphin Mela at their cluster. More than 500 schools were part of the conservation awareness programme.

Source: *www.wdcs.org and CEE*

Map 1 : Dolphin Distribution Rivers



Map 2 : The Indus River system, and the location of irrigation barrages and dams.



Legend

- Town/City
- Dam
- Barrage

Indus Dolphin Subpopulations

1. Jinnah to Chashma
2. Chashma to Taunsa
3. Taunsa to Guddu
4. Guddu to Sukkur
5. Sukkur to Kotri
6. Beas River

Barrages

1	Kotri
2	Sukkur
3	Guddu
4	Taunsa
5	Chashma
6	Jinnah
7	Panjnad
8	Trimmu
9	Rasul
10	Qadirabad
11	Khanki
12	Marala
13	Sidhnai
14	Balloki
15	Madhopur
16	Islam
17	Suleimanki
18	Hussainiwala
19	Harike
20	Shah Nehar
21	Ropar
26	Khurram Garhi

Dams

22	Mangla
23	Ghazi Barotha
24	Tarbela
25	Warsak

***Source**: Braulik, 2012*

In the dry season, the three rivers allocated to India enters Pakistan when virtually become dry and almost all flow from the remaining two tributaries is utilized by Pakistan, with the result the lower reaches of all five Indus tributaries are frequently de-watered (Braulik, 2006). While there were occasional reports of dolphin sightings in the Indus tributaries during the 1980s (Roberts, 1997). It was considered likely that dolphins have been completely vanished from these rivers due to insufficient and inconsistent water supplies.

Although, Indus dolphins occur in various subpopulations bounded by many irrigation barrages on the Indus River System. One such unique sub-population of Indus River dolphin occurs in the Beas River in India (Behera et al. 2008). In early December 2007, Basanta Rajkumar (IFS), Divisional Forest Officer and Sanctuary In-Charge, Harike Wildlife Sanctuary during a routine visit of the sanctuary spotted an Indus River dolphin. After this sighting, Department of Forests, Govt. of Punjab approached World Wide Fund for Nation-India (WWF-India) to confirm this rare sighting. In early 2008, a team of WWF-India officials led by Dr Sandeep Behera, Dolphin Coordinator, under the wetland programme at the WWF-India and Dr. Asghar Nawab, expert on aquatic mammals, conducted extensive surveys at the Harike sanctuary with the support of the Forest Department staff. After three days of extensive river-patrolling it was concluded and confirmed that Beas-Sutlej River system of Harike has Indus River dolphins (WWF-India, 2008).

Harike sanctuary is situated at the confluence of the river Beas and the Sutlej near a small town Harike **(Map 3)**, and is bordering the districts of Tarn Taran, Ferozepur and Kapurthala. Sanctuary encompasses an area of approximately 86 sq km. The reservoir came into being after the construction of the barrage in 1953.

Map 3. Aerial view of river system at Harike Wetland

Source: *Googleearth, 2013*

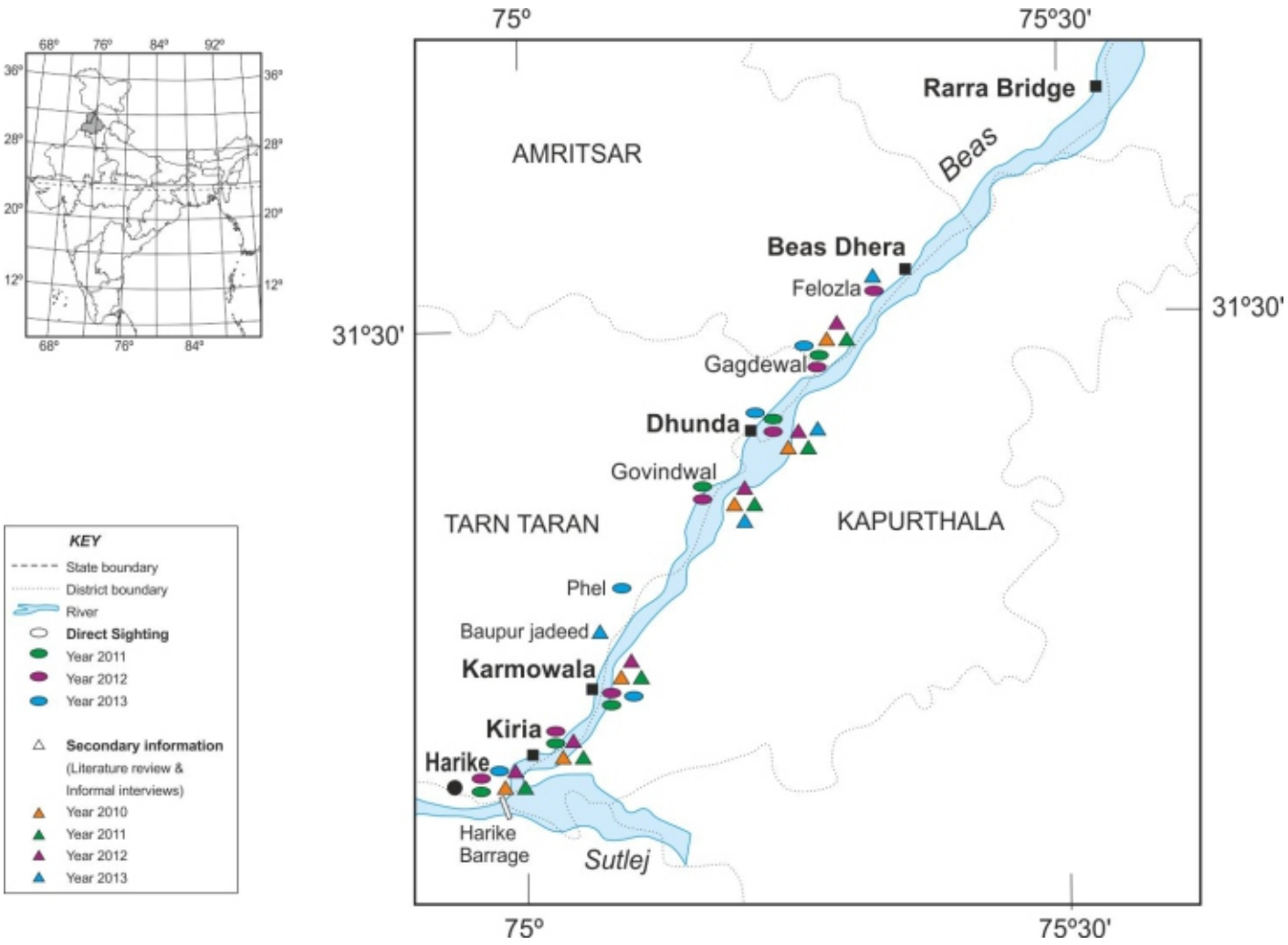
The area was declared as a Wildlife Sanctuary in 1999 and because of its importance as a wetland of international stature, it was declared a Ramsar site by the International Body of Wetlands under the UNDP in 1990. It is also one of the largest wetlands in the Northern India. Spread over an area of 41 sq.kms, this wetland provides a vital habitat for a number of floral and faunal components including the diversity of migratory avifauna.

Status of Distribution of Indus River Dolphin in River Beas

Field assessment studies conducted between April 2011 to May 2013 by WWF-India in collaboration with Department of Forests, Govt. of Punjab examined the possible existence and conservation viability of the only reported breeding population of the endangered Indus River dolphin *Platanista gangetica minor* in Punjab.

WWF-India's observations showed that dolphins occur in River Beas Harike wetland **(Map 4)**. A total of 25 sighting frequencies (f = no. of times group of dolphin sighted during the study period) were reported during the study period. These sightings were largely concentrated in zones Baguwal-Dhunda [f = 7]; Karmowala-Dhun [f = 6]; Beas bridge-Gagdewal [f = 3] Gagdewal-Baguwal [f = 3]; Dhun-Harike [f = 3]; Dhunda-Aalm kha [f = 2] and Aalm kha-

Map 4. Records of Indus River Dolphin sightings on the river Beas and Harike



Source: *WWF-India, 2013*

Karmowala [f = 1]. 3 groups were identified, one each along Beas bridge-Gagdewal; Baguwal-Dhunda and Karmowala-Harike that comprised of adult, sub-adult and calves. On 9 occasions adult Dolphins were recorded solitary. During the course of the study opportunistic sightings of adult Dolphins were also recorded, 6 at Harike Wildlife Sanctuary while 3 at Karmowala (WWF-India, 2013).

Unlike many marine dolphins, Indus dolphins do not form easily defined, interactive groups. Instead, they are frequently observed in loose aggregations with little apparent interaction between individuals. Their occurrence has been attributed to preferred habitat features such as deep pools, slow water current, abundant prey base and low disturbance. During the study period dolphins were generally sighted in loose groups of 2-3 individuals at three different sites in River Beas and they preferred habitats with deeps areas having slow water current and moderate to wide river width.

In September 2013, the officials of Harike wildlife sanctuary during the monthly monitoring spotted 12 Indus dolphins in a single sighting and it was concluded that their estimated number could be around two dozen in and around the sanctuary (TOI, 2013).

Species Description

The Indus River dolphins are about 7-8.5 ft (2.2-2.6 m) long and weigh 150-200 lbs (70-90 kg). The Indus River subspecies is considered slightly smaller than the Ganges River subspecies (Jefferson et al. 2008). Females are slightly larger than males. They have an unusual robust or chunky body with a low triangular 'dorsal' fin located far (about two-thirds) down their back. They have a rounded 'melon', a very long narrow beak, extremely small eyes, and noticeable external ears. A longitudinal ridge can be found on the melon as well as from the dorsal fin to the tail. The eyes are poorly-developed (lack a crystalline eye lens) and located above the corners of the mouth (Shirihai and Jarrett 2006).

Its eyes look like pinhole opening. The eyes do not have lens which is why it is sometimes called the 'blind dolphin' but it seems that the eyes can detect light and shade. As the river is about using echolocation (direction-finding by following echoes breathing mammal, not a fish and comes to the surface to breathe through the blowhole on the top of its head about every 1 to 2 minutes. These animals have a uniformly grey coloration pattern with a pale white or pinkish underside, giving a slight counter-shading effect. As this species ages and matures, the melon gradually becomes less rounded.

Behavior

Indus River dolphins are usually found individually or in pairs, but have been occasionally seen in larger groups of up to 10 or more animals. Little information is available or known on the social structure of these groups, (NOAA,2012). Indus River dolphins' swimming behavior is often described as active, yet timid and reserved. This species is frequently seen swimming on its side, especially when in captivity. When at the water's surface, these animals can breach or just lift their heads and beaks out of the water. Breaching (leaping out of water) may occur as a response to threats and other disturbances (Shirihai and Jarrett, 2006). Indus River dolphins' generally dive for 30-90 seconds, but are capable of holding their breath for up to several minutes.

Feeding

During dives they use their long beaks to probe the sediment along the bottom of the river to feed on prey such as clams, fish, and shrimp. They

have 26-39 pairs of teeth in each jaw that are useful for grasping prey. The fang-like teeth in the lower jaw are comparatively longer and curved, and may interlock, overlap, and be visible outside the mouth. As these animals get older, the teeth become worn-down. Groups may coordinate their movements to cooperatively feed on prey.

Reproduction

Indus River dolphins become sexually mature at lengths of about 5.5 ft (1.7 m) or more, and begin breeding between 6-10 years of age. Females give birth the year-round to a single calf that is about 2-3 ft (0.7-0.9 m) long. Mothers may also nurse calves for about 1 year before weaning. The estimated lifespan of this species is about 30 years (NOAA, 2012).

Habitat

Indus River dolphins prefer the fresh and possibly brackish, shallow (usually less than 30 mts in depth), murky waters of the Indus River system in Pakistan and Beas-Sutlej rivers system at Harike wetland. This species may occur in the main channels of rivers and in tributaries and lakes during the flood season (NOAA, 2012).

Threats

The world's freshwaters are biodiversity hotspots, inhabited by almost 6% of described species yet covering only 0.8% of the earth's surface. However, they are also hotspots of endangerment and are experiencing declines in biodiversity far greater than those in terrestrial ecosystems (Dudgeon et al. 2006, Strayer & Dudgeon, 2010). Freshwater dolphins and porpoises are among the world's most threatened mammals. Although no comprehensive study has been yet conducted to assess the threats faced by the Indus River dolphin spotted at Harike wetland, but studies conducted on this species in Pakistan has mapped out following major threats being faced by this dolphin:

- ***Habitat fragmentation :*** The most significant threat to dolphins in the Indus has been the construction of at least 25 dams and barrages that have severely fragmented the population and reduced the amount of available habitat (Smith and Reeves 2000). Upstream subpopulations may lose individuals downstream if dolphins move through barrage gates when they are open in the wet season. Individuals are unlikely to move upstream through a barrage because of strong downstream hydraulic forces at the gates. While there have been no direct observations of dolphins moving through a barrage, they often swim through regulator gates into irrigation canals, which, although smaller, present a similar obstacle (Braulik, 2002).

- **Migration:** Since the mid 1990s, there have been increasing reports of dolphins trapped in irrigation canals near Sukkur Barrage, the Sindh province of Pakistan. Dolphins have survived for several months in the canals until they are drained in January for annual de-silting and maintenance. Between January 2000 and December 2002, 34 dolphins were reported trapped in these canals. Twenty-four were successfully rescued and returned to the Indus River, while the remaining died (IUCN, 2012).

- **Loss of Habitat :** One of the major threats to the survival of the Indus River dolphin is probably the escalating demand for water. Pakistan is a largely desert nation, with a rapidly growing human population and fast developing industrial and agricultural sectors that demand increasing amounts of water.

Several years of extreme drought have depleted aquifers that would normally be expected to augment river flows in the dry season.

- **Pollution:** Pollution may be affecting the viability of the subspecies, especially considering the decline in flushing and dilution due to reduced flows.

- **Poaching:** Deliberate killing for meat and oil was a traditional and widespread practice until at least the early 1970s (Pilleri and Zbinden 1974). Hunting is now banned although poaching occasionally occurs. Similar to all cetaceans, this subspecies is vulnerable to entanglement in fishing gear and vessel collisions. However, the areas of the Indus River where dolphins are present are not heavily fished and this factor may not be major threat at present. Incidents of accidental killing and observations of dolphin carcasses and products are documented by Reeves *et al.* in 1991 and Reeves & Chaudhary in 1998.

Conservation Efforts

In numerous parts of the world, various international conventions have outlined the threats faced by wetland ecosystems and aquatic life, and therefore have brought out regulations to ensure their preservation. Like Ganges River dolphin, Indus River dolphin is perhaps an indicator species for the river ecosystem and is at the apex of the food chain. It is an endemic and rare aquatic mammal found only in the Indian subcontinent and is part of our natural aquatic heritage. WWF-India has already prioritized the conservation of flagship aquatic species and habitat. Under the River Dolphin project, WWF- India works on three species of Dolphins, namely- Ganges River Dolphin (in the Ganga River and its tributaries), Indus River Dolphin (In the River Beas, Punjab) and Irrawaddy Dolphin (in Chilika Lake, Orissa).

The declaration of the Ganges River dolphin as India's national aquatic animal in 2009 has been viewed as the first positive step in conservation and awareness of this aquatic animal, which is said to be the world's most threatened mammal.

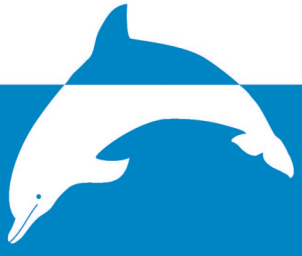
As an initial step for the conservation of Indus River Dolphin in India, WWF-India has concluded its three years study which was initiated with following objectives:

1. To assess the distribution, habitat and threats/disturbances to Indus River Dolphin.

2. To initiate conservation programmes like Water school and Better Management Practices (Agricultural) in riparian villages.

At Harike Wetland, besides monthly monitoring of dolphins, no other project for conservation or protection of Indus Dolphin has been launched so far. Although Department of Forests, Govt. of Punjab has chalked out a comprehensive plan to develop Karmowal village near Harike Wetland as a tourist destination.

Let us conserve Dolphin



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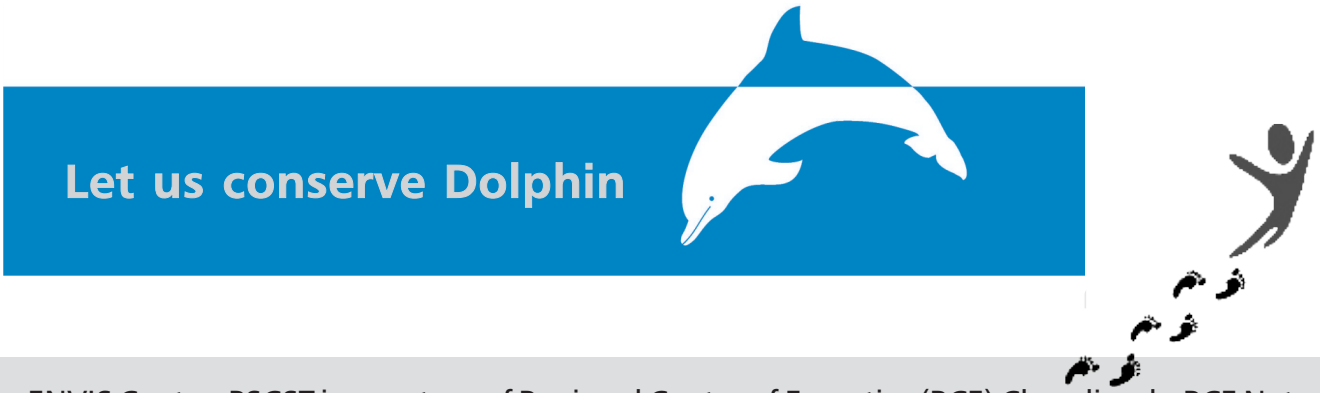

ENVIS Centre, PSCST is a partner of Regional Centre of Expertise (RCE) Chandigarh. RCE Network is an initiative of United Nations University – Institute of Advanced Studies, Japan, which focuses on Education for Sustainable Development (ESD). This article on conservation and importance of river dolphin with special focus on indus dolphin reinstate PSCST's endeavour for creating awareness and capacity building of all stake holders.

For the first time, a dozen dolphins spotted in Beas

AMRITSAR : For the first time, the officials of Harike wildlife sanctuary, 60km from Amritsar, have spotted 12 Indus dolphins, an endangered species, in a single sighting.

Divisional forest officer M Sudhagar told TOI on Sunday that during the monthly monitoring, they spotted a dozen Indus freshwater dolphins in three groups. "With this single sighting, we can estimate that their number could be around two dozen in and around the sanctuary," the officer said.

The monthly monitoring of the dolphins is conducted jointly by teams of World Wide Fund for Nature and Harike wildlife sanctuary.

The endangered freshwater Indus dolphin *(Platanista minor)* is found only in this stretch of India. Around six years ago, the Harike wildlife sanctuary officials had spotted a pair of freshwater dolphins for the first time in the country at the confluence of Beas and Satluj rivers.

As the word spread, the government had announced to launch a conservation project for dolphins and develop the area as a major tourist spot, but nothing happened till now.

Indus dolphin is one of the world's rarest mammals and most endangered cetaceans.

Village as tourist destination

Indus dolphin is one of the world's rarest mammals and most endangered cetaceans. Only about 1,100 such unique species exist today in the lower reaches of the Indus in Pakistan. Their number had drastically declined since the construction of dams on the river.

The dolphins were found in the 75km stretch of the Beas, which also includes around 3km stretch of the Harike wildlfe sanctuary. Divisional forest officer M Sudhagar told TOI on Sunda that besides monthly monitoring of dolphins, no project for their conservation or protection had been launched so far.

The officer added that the department had chalked out a plan to develop Karmowal village as a tourist destination by taking some rented accommodation but that project also didn't take wings.

Sources said the state government had not sent any proposal to the Centre in this regard and the government had not shown any interest in declaring the sight as conservation reserve to protect the dolphins. The officer added that the department had chalked out a plan to develop Karmowal village as a tourist destination by taking some rented accommodation but that project also didn't take wings.

Sources said the state government had not sent any proposal to the Centre in this regard and the government had not shown any interest in declaring the sight as conservation reserve to protect the dolphins.

Source : *9th Sept, 2013, The Economic Times.*

Dolphins call each other by name like humans : Study

LONDON : Dolphins have names for each other and call for each other just like humans, a new study has revealed.

Research conducted by the University of St Andrews in Scotland has found that the marine mammals use a unique whistle to identify each other, the BBC reported.

It was suggested that when the animals respond after they hear their own call played back to them.

According to Dr Vincent Janik, from the university's Sea Mammal Research Unit, dolphins live in this three-dimensional environment, offshore without any kind of landmarks and they need to stay together as a group.

Janik said that these animals live in an environment where they need a very efficient system to stay in touch.

It had been-long suspected that dolphins use distinctive whistles in much the same way that humans use names.

To investigate, researchers recorded a group of wild bottlenose dolphins, capturing each animal's signature sound, after which they played these calls back using underwater speakers.

They found that individuals only responded to their own calls, by sounding their whistle back.

The team believes the dolphins are acting like humans: when they hear their name, they answer.

Janik said most of the time dolphins can't see each other, they can't use smell underwater, which is a very important sense in mammals for recognition, and they also don't tend to hang out in one spot, so they don't have nests or burrows that they return to.

The study is published in the Proceedings of the National Academy of Sciences.

Source : *23rd July, 2013, The Economic Times*

EVENTS

Two day National Conference on Sustainable Water Resources Management

21st to 22nd February 2014
Venue: Vizianagaram, Andhra Pradesh, India
Website: http://www.swarm14.webs.com
Contact person : Mr Ch.V Ravi Sankar
Organized by: MVGR College of Engineering and AICTE, India

International Conference on Global Crisis and Environmental Governance in North-Eastern Region of India, 2013

11th to 13th November 2013
Venue: Silchar, Assam, India
Website: http: //www.aus.ac.in/
Contact person: Alauddin Mondal

132nd International Conference on Biodiversity and Climate Change (ICBCC 2013)

17th to 18th November 2013
Venue: Abu Dhabi, United Arab Emirates
Website: http://www.icbcc.org/
Contact person: Mr Issac Lee
Organized by: CBEES

13th International Conference on Sustainable Environment and Agriculture (ICSEA 2013)

17th to 18th November 2013
Venue: Abu Dhabi, United Arab Emirates
Website: http://www.icsea.org/
Contact person: Ms Eve Li

International Conference on Energy, Environment and Economics

1st to 4th December 2013
Venue: Bangkok, Thailand
Website: http://www.iceese.org
Email: contact@iceese.org
Contact person: Will
Organized by: Department of Civil Engineering

132nd International Conference on Environment, Chemistry and Biology (ICECB 2013) 13th to 14th December 2013

Venue: Stockholm, Sweden
Website: http://www.icecb.org/
Contact person: Ms. Yang
Organized by: CBEES

International Conference on Environment & Energy (ICEE 2013)

16th to 17th December 2013
Venue: Colombo, Sri Lanka
Website: http://www.enviornment3000.com
Contact person: Prabhath Patabendi
Organized by: International Center for Research & Development

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Invitation for Articles

Punjab ENVIS Centre Newsletter is committed to collect, collate & disseminate information on 'Status of Environment & Related Issues'. The Newsletter is extensively distributed at the State, National and International levels. To obtain information from grass root level for further dissemination, the Centre invites articles, review papers, case studies, success stories or news items relevant to the subject area for publishing the same in the forthcoming issues of the Newsletter.

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