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NEED TO CONSERVE SOUTH ASIAN ENDANGERED RIVER DOLPHINS

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ABSTRACT

This paper focuses on the four families of river dolphins out of which the Chinese dolphins have recently become extinct in 2007. The main aim of this paper is to assess the danger the Gangetic river dolphins are in and how they can be saved from the fatal end of extinction faced by their Chinese cousins. Till 1998 Ganges and Indus river dolphins were considered as two different species. These river basins of South Asian Dolphins are also the homes of over 15 per cent of our planet's people and include some of the most densely populated, and poorest, areas on Earth. River dolphins are in danger of extinction due to habitat loss, hunting by humans, Dam-building, entanglement in fishing nets, boat traffic and pollution have led to drastic declines in dolphin populations over the last several decades. High traffic, Noise pollution and harassment by tourist boats in some rivers causes stress in dolphins and can lead to collision with boat propellers. The world population of this Asian Dolphins was 4000 - 5000 in 1982 according to IWC 2000 and now it has come down to 1,200 - 1,800 in 2006 as according to IUCN 2006 report. Hence conservation of this species is mandatory.

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INTRODUCTION

The shrill high pitched whistles, the high spirited leaps and the playful antics of the Dolphins are becoming a thing of the past. The sudden decline in their numbers especially of inland-fresh water dolphins has raised an alarm among the conservationists, demanding a serious look into the issue. According to Hamilton et el. 'the world's river dolphins (Inia, Pontoporia, Lipotes and Platanista) are among the least known and most endangered of all cetaceans'[I] This paper focuses on the four families of river dolphins out of which the Chinese dolphins have recently become extinct. The main aim of this paper is to assess the danger the Gangetic river dolphins are in and how they can be saved from the fatal end of extinction faced by their Chinese cousins.

FOUR FAMILIES OF RIVER DOLPHINS:

Dolphins are classed under the Platanistoidea super family of cetaceans. Three species live in fresh water rivers. The fourth species, the La Plata Dolphin, lives in salt-water estuaries and near-shore marine environments. However, it is scientifically classed in the river dolphin group rather than the oceanic dolphin family. Both river dolphins and marine dolphins belong to a group of mammals called cetaceans. But these two dolphins differ somewhat in appearance. For example, the snout of a river dolphin measures about 58 centimetres [1 foot] long, approximately four times as long as that of most marine dolphins. River dolphins have smaller eyes than marine dolphins, and their vision is poorly developed because they live in dark, muddy water. This environment also makes river dolphins less active than marine dolphins.

The fresh water species are: Ganges and Indus river dolphins (Sisu and Bhulan), Amazon river dolpins (Boto) and Chinese river dolphins (Baiji). La Plata Dolphin (Franciscana) is the only salt water river dolphin found in South America. All these four species are critically endangered. In fact, Baiji or Chinese river dolphins are declared functionally extinct in 2007.

1. *Endangered Ganges and Indus river dolphins:*

Till 1998 Ganges and Indus river dolphins were considered as two different species. But in 1998 they were recognized as two sub species of the same species. The These dolphins are found in India, Pakistan, Bangladesh, and Nepal (in Ganges, Brahmaputra and Indus rivers and their tributaries). The Endangered Ganges river dolphin, or susu, 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 total estimated numbers of Ganges river dolphins is around 2000. Out of these, around 300 lives in Brahmaputra and are facing critical threat due to accidental killing through fisheries bycatch, followed by poaching for oil. Few decades ago the dolphins were widely seen across Brahmaputra and almost all its tributaries. But now the dolphins survive only in small pockets of the river. The Indus river dolphins (also known as Blind river dolphins) are found in

the lower reaches of Indus River in Pakistan. It is believed that only 1000 of this species exist now in the Indus River. Fig:1 Ganges and Indus river dolphin.

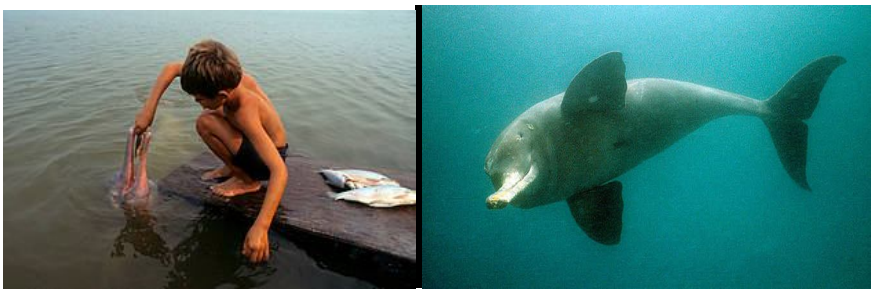

Figure I: A boy feeding a dolphin in Brahmaputra
Figure II: An Indus river dolphin

2. *Amazon river dolphins:*

The Amazon river dolphins, also known as the pink river dolphin or boto, inhabit Orinoco, Amazon and Araguaia/Tocantins River systems of Brazil, Ecuador, Bolivia, Peru, Ecuador, Colombia and Venezuela. This species is the largest and the most intelligent of all river dolphin species. Although widely available in the Amazon, the number of this species is reducing every year. They can only live in freshwater. It is the most abundant freshwater cetacean and probably numbers in the tens of thousands. However, it is classified as Vulnerable, with several dams having already fragmented the Amazonian population, and many more proposed. Scientists believe that 1,500 dolphins are being killed annually in the western Amazon to fuel a lucrative trade in catfish, which feeds on dead animals.

3. Chinese river dolphins (extinct):

The Critically Endangered Yangtze river dolphin, or baiji, can only live in freshwater and has very poor eyesight. It once lived in the lower and middle reaches of the Yangtze River, Fuchun River, and in Dongting and Poyang Lakes, China.

A team of scientists have concluded that the Chinese River dolphin, or baiji, is now functionally extinct following comprehensive surveys of its habitat. Till 2006 it was found in Yangtze river of China. It is one more unfortunate event to animal history caused by human civilization. In last fifty years it is the only aquatic mammal extinction known to humans. Till 1950, around 6000 of this species existed in Yangtze river. But in few decades the number reduced due to hunting, pollution, habitat loss and other human interferences. The last Baiji was sighted in 2007. Fig: 2: Yangtze River Dolphin

Figure I: A Chinese river dolphin in Yangstze

4. La Plata river dolphins:

La Plata dolphins are the only river dolphins found in salt-water. They inhabit the coastal Atlantic waters of south-eastern South America. They are greyish brown colour with the longest beak. The La Plata Dolphins grow 6 feet in length, weigh up to 50 kg (110 lb) and live for up to 20 years. The La Plata River Dolphin is well known because of where it chooses to build its habitat. It ranges through the La Plata River, which moves through Brazil and Argentina. Despite other fresh water dolphins, this particular dolphin has adapted to dual type of water living. It can move back and forth from the salt waters of the ocean and to the river waters that are fresh. Scientists have raised concerns over the conservation of this species. Large numbers of them are hunted or killed every year.

GEOGRAPHICAL DISTRIBUTION OF RIVER DOLPHINS IN ASIA AND S. AMERICA:

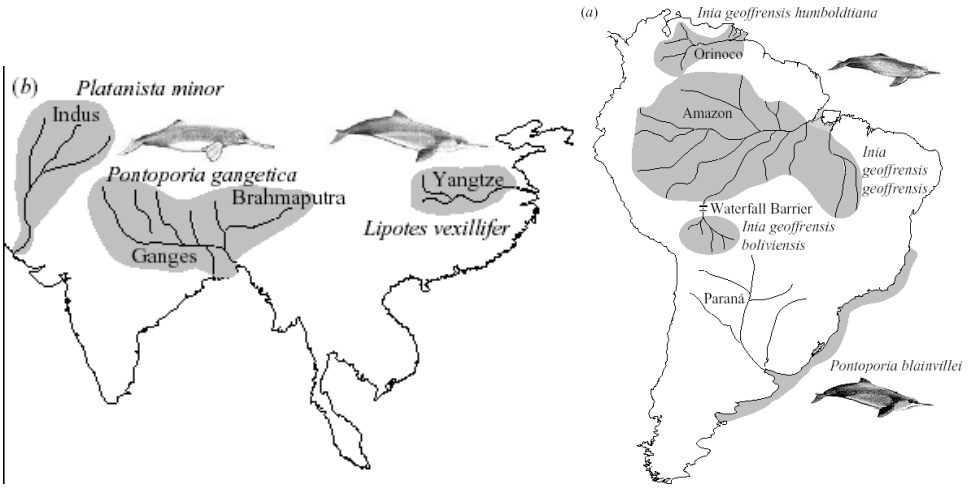

Figure IV: Dolphins distribution in Asia and South America

EXTINCTION OF THE CHINESE VARIETY -BAIJI:

In the 1950s, the population was estimated at 6,000 animals, but declined rapidly over the subsequent five decades. Only a few hundred were left by 1970. Then the number dropped down to 400 by the 1980s and then to 13 in 1997 when a full-fledged search was conducted. Now the most endangered cetacean in the world, according to the Guinness Book of World Records, the Baiji was last sighted in August 2007. And no members of Lipotidae (commonly known as the Yangtze River dolphin) were found after that and declared the species functionally extinct.

The Yangtze River dolphin or Baiji (Lipotes vexillifer), an obligate freshwater odontocete known only from the middle-lower Yangtze River system and neighbouring Qiantang River in eastern China, has long been recognized as one of the world's rarest and most threatened mammal species. The status of the Baiji has not been investigated since the late 1990s, when the surviving population was estimated to be as low as 13 individuals. An intensive six-week multi-vessel visual and acoustic survey carried out in November–December 2006, covering the entire historical range of the Baiji in the main Yangtze channel, failed to find any evidence that the species survives. We are forced to conclude that the Baiji is now likely to be extinct, probably due to unsustainable by-catch in local fisheries. This represents the first global extinction of a large vertebrate for over 50 years, only the fourth disappearance of an entire mammal family since AD 1500, and the first cetacean species to be driven to extinction by human activity. Immediate and extreme measures may be necessary to prevent the extinction of other endangered cetaceans, including the sympatric Yangtze finless porpoise (Neophocaena phocaenoides asiaeorientalis). The last verified sighting was in September 2004. In August 2007, reports surfaced that a man saw and videotaped what appears to be a Baiji in the Yangtze River. A team of scientists attempted to verify the sighting in September 2007 but in vain.

CAUSES OF EXTINCTION:

The World Conservation Union (IUCN) has noted the following as threats to the species: a period of hunting by humans during the Great Leap Forward, entanglement in fishing gear, the illegal practice of electric fishing, collisions with boats and ships damming, sub-aquatic sonar pollution (which interfered with the dolphin's sonar-based method of locating food), habitat loss, and pollution.

During the Great Leap Forward, when traditional veneration of the Baiji was denounced, it was hunted for its flesh and skin, and quickly became scarce. As China developed economically, pressure on the river dolphin grew significantly. Industrial and residential waste flowed into the Yangtze. The riverbed was dredged and reinforced with concrete in many locations. Ship traffic multiplied, boats grew in size, and fishermen employed wider and more lethal nets. Noise pollution caused the nearly blind animal to collide with propellers. Stocks of the dolphin's prey declined drastically in recent decades as well, with some fish populations declining to one thousandth of their pre-industrial levels.

In the 1970s and 1980s, an estimated half of Baiji deaths were attributed to entanglement in fishing gear. By the early 2000s, electric fishing was considered "the most important and

immediate direct threat to the Baiji's survival. Though outlawed, the destructive fishing technique is widely practised throughout China. The building of the Three Gorges Dam further reduced the dolphin's habitat and facilitated an increase in ship traffic.

SOUTH ASIAN RIVER DOLPHIN-DESCRIPTION:

The Ganges river dolphin has been recognized by the government of India as its National Aquatic Animal[II]

Other Names of the species: Blind Dolphin, Delfín del Ganges, Ganges-Delphin, Ganges Dolphin, Ganges Susu, Gangetic Dolphin, Hihu, Plataniste du Gange, Shushuk, Side-swimming Dolphin, Sousou, Susu[III]

Kingdom: Animalia
Phylum: Chordata
Class: Mammalia
Subclass: Eutheria
Order: Cetacea
Suborder: Odontoceti
Superfamily: Platanistoidea
Family: Platanistidae Gray, 1846
Genus: Platanista Wagler, 1830
Species: P. gangetica
Binomial name: Platanista gangetica
Subspecies: Platanista gangetica gangetica, Platanista minor minor

Physical appearance:

The Ganges river dolphins ("Susu" or "Hihu") may be white, pink, yellow, brown, gray, or black. The South Asian River Dolphins have the long, pointed noses characteristic of all river dolphins. The teeth are visible in both the upper and lower jaws even when the mouth is closed. The teeth of young animals are almost an inch long, thin and curved; however, as animals age the teeth undergo considerable changes and in mature adults become square, bony, flat disks. The snout thickens towards its end. The species does not have a crystalline eye lens, rendering it effectively blind, although it may still be able to detect the intensity and direction of light. Navigation and hunting are carried out using echolocation. The body is a brownish colour and stocky at the middle. They have elongated beak with about 28 sharp curved teeth on each side of upper and lower jaws. The species has only a small triangular lump in the place of a dorsal fin. The flippers and tail are thin and large in relation to the body size, which is about 2-2.2 meters in males and 2.4-2.6 m in females. The dorsal fin is short but the caudal fluke is well developed. The oldest recorded animal was a 28 year old male 199 centimeters in length. Mature adult females are larger than males. As they are mammals they breath air with lungs and come to the surface for breathing. They have to surface at least once in 30-50 seconds. Sexual dimorphism is expressed after females reach about 150 centimetres (59 in); the female rostrum continues to

grow after the male rostrum stops growing, eventually reaching approximately 20 centimetres (7.9 in) longer. Calves were observed between January and May and do not appear to stay with the mother for more than a few months. They feed their young ones with milk from the mammary glands located near its anus.

Size and Weight: The Ganges River dolphin measures 1.5 - 2.5 m (4.9 - 8.2 ft) in length and weighs up to 90 kg-100 kg (200 lb).

Habitat: The Ganges River dolphin occurs only in fresh water in Bangladesh and India, where the rivers flow slowly through the plains, as well as in Nepal, where the dolphin can be found in relatively clear water and rapids. In both areas, there is a preference for deep waters, especially deep counter-current eddy pools below channel convergences and sharp meanders and above and below mid-channel islands, bridge pilings, and other engineering structures that cause scouring. The Ganges River dolphin lives not only in the main channels, but also, during the flood season, in seasonal tributaries and flooded lowlands. It has been found in water between 8 and 33 deg C (46 - 91 deg F). Brackish waters are a major component of the total range, but the Ganges River dolphin is not generally known to occur in salinities greater than 10 ppt, although it has been recorded in waters as saline as 23 ppt. (Klinowska 1991, Sinha 2000, Sinha et al. 2000, Smith et al. 2001, Culik 2003c, IUCN 2006) The Ganges River dolphin lives in the Indo-Burma Biodiversity Hotspot (Cons. Intl.).

The marked seasonal changes in the distribution and density of the Ganges River dolphin over much of its range are due, at least in large part, to fluctuations in water levels. During the dry season from October - April, many dolphins leave the tributaries of the Ganges - Brahmaputra system and congregate in the main channels, only to return to the tributaries the following rainy season. They may become isolated in pools and river branches during the dry season.

Age to Maturity: Males become sexually mature at 1.7 m (5.6') or less, at an age of about 10 years. The smallest sexually mature female so far reported was 2.0 m (6.6'). (Klinowska 1991) They mature at an age of 6-7 years and may live for about 35 years. (IUCN 2006).

Gestation Period: They give birth to a calf of length of about 65 cm after a gestation period of about 9-10 months.

Birth Season: Calving apparently can occur at any time of the year, but there may be peaks during December - January and March - May.

Birth Rate: A single young is born.

Early Development: The young begin eating solid food 1 - 2 months after birth and are weaned within 1 year.

Diet: The Ganges River dolphin feeds on several species of fish (e.g. catfish, freshwater shark, mahseers, gobies and carp), invertebrates (e.g. prawns and clams), including carp and catfish.and possibly turtles and birds. It does much of its feeding at or near the bottom, using echolocation, swimming on one side, and probing the river bottom with its snout and flipper.

Blindness: The waters that the Ganges River dolphin inhabits are extremely murky. Probably for this reason, the dolphin's sight has degenerated. Its eye lacks a lens, and the dolphin is

sometimes referred to as being blind, although its eyes do seem to be used for direction-finding. To find food, it probably uses echolocation and also probes with its sensitive snout and flipper for prey in the bottom mud. (Nowak 1999) Its optic sense organs have degenerated and their eye lens have atrophied. But the loss of vision is compensated by the well developed sonar sense.Because of their poor eye sight they cannot be trained as in the case of marine dolphins. Further they do not live for long in captivity. Hence they cannot be kept for shows in dolphinariums. The uniqueness of the dolphin is their highly developed sonar sense. It is the only aquatic mammal which has developed its sonar sense (sound) to an extent that it captures its food and navigates with the help of echolocation. They produce ultra sonic sound upto 200 000 Hz where as the hearing capacity of the human ear is only 18 000 Hz.

Danger of Extinction of South Asian River Dolphins:

These river basins of South Asian Dolphins are also home to over 15 per cent of our planet's people and include some of the most densely populated, and poorest, areas on Earth. River dolphins are in danger of extinction due to habitat loss, hunting by humans, and naturally low numbers. Dam-building, entanglement in fishing nets, boat traffic, and pollution have led to drastic declines in dolphin populations over the last several decades. Several Asian species are now amongst the most endangered of all cetaceans. Urgent action is needed to prevent these charismatic animals, about which we still know very little, from becoming extinct.

The world Population of Ganges River Dolphins[IV] shows the extent of danger

1982: 4000 - 5000 (IWC 2000)

1997: Fewer than 2000 (IWC 2000)

2003: At least hundreds and probably a few thousand

2006: At least 1,200 - 1,800, but could be several times as high.

By 1982 the dolphin population in India had fallen heavily. Conservationists say that the situation has reached crisis point and that the Ganges Dolphin is on course to suffer the fate of its Chinese cousin, the Yangtze River Dolphin, or Baiji. India’s booming human population, like China’s, is taking too much water from its largest river, radically altering its flow, and pumping too much waste in. The dolphins, which need deep, clean water and often drown in fishing nets, have paid the price. Fig 3 shows the picture of a river Dolphin slaughtered near Dhubri, Brahmabudra

Fig III -River Dolphin slaughtered near Dhubri, Brahmabudra

The rivers and lakes in which freshwater cetaceans are found are subject to many, often intensive, human activities that have caused extensive habitat loss and degradation.

Construction of dams: Construction of 50 or more dams have divided many species into small, isolated populations, making them susceptible to inbreeding and more vulnerable to other threats as they cannot move to new areas. Several dolphin populations completely disappeared following the construction of a dam. Dams also disturb the migration, breeding cycles and habitat of fish and other prey species, and so reduce the cetaceans' food supply. In addition, dams change the natural flow and distribution of water. For example, barrages and irrigation have greatly reduced water volume in the Indus and Ganges Rivers, leading to a dramatically reduced dry-season range for river dolphins. Reduced flows have also caused saltwater to intrude an additional 160km into the Sundarbans Delta of the Ganges River, further decreasing the amount of suitable habitat for freshwater dolphins. The Yangtze, Indus, and Ganges Rivers are already heavily dammed, with many more large dams planned or under construction.

Construction of embankments: Construction of barrages within the Ganges River dolphin's historic range has drastically altered its habitat and fragmented the population. More such structures are planned or are under consideration. Approximately 3500 km (2200 mi) of embankments have been constructed along the main channel of the Ganges and its tributaries. Embankments interrupt access to spawning habitat for floodplain-dependent fishes and eliminate eddy counter-currents where the dolphins spend much of their time. Dredging and the removal of stones, sand, and woody debris also compromise the ecological integrity of the riverine environments, especially in small tributaries. Concentrations of toxic chemicals such as organochlorine and butyltin in the tissues of Ganges River dolphins are high enough to cause concern about adverse effects. Incidental mortality in fishing gear, especially gillnets, is a severe problem for the Ganges River dolphin throughout most of its range.

Industrial, agricultural, and human pollution: This is another serious cause of habitat degradation, particularly for the Indus, Ganges, and Yangtze Rivers. Each year, 2,500 tonnes of pesticides and 1.2 million tonnes of fertilizer are used in the vicinity of the Ganges River, while 80 per cent of the 15.6 billion cubic meters of waste water discharged into the Yangtze is not treated. The Ayeyarwady, Mekong, and Amazon Rivers are also polluted by mercury, cyanide, and arsenic leaching from gold mining activities, and the Amazon and Orinoco Rivers have been polluted by oil spills in Colombia. In many areas, the ability of the rivers to dilute and flush out pollutants has been drastically reduced due to upstream water diversion and removal. High levels of pollution can directly kill prey species and dolphins, and completely destroy their habitat. As the top predator, river dolphins have been shown to have high levels of persistent toxic chemicals in their bodies, which is likely to adversely affect their health. One explanation for the high number of dead and stillborn Irrawaddy dolphin calves found in Songkhla Lake could be high levels of toxins from agrochemicals used intensively along the lakeshore. As industrialization and development speeds up throughout the dolphins' range, pollution is expected to increase.

Noise and congestion caused by boats: This can also be a serious problem. The rivers in which cetaceans live are often very muddy, so the animals rely primarily on echolocation to

navigate and find food. Noise pollution can interfere with this. High traffic and harassment by tourist boats in some rivers causes stress in dolphins and can lead to collision with boat propellers.

Other human activities: Other human activities, such as clearing of river banks, deforestation, sand mining, dredging, and land reclamation, particularly along the Yangtze, have also contributed to the decline in both the quality and quantity of freshwater cetacean habitat, while overfishing has reduced their food supply.

All of these habitat degradation factors harm not only the dolphins, but also the millions of people living in these river basins, whose lives and livelihoods depend on healthy,
Unpolluted river systems.

Accidental death: Freshwater cetaceans are extremely vulnerable to bycatch, or
incidental capture in gillnets and other modern fishing gear. A recent study in the mouths of the Amazon suggested that over 1,050 tucuxis drowned in fishing gear in a single year. In the Mekong River, at least four Irrawaddy dolphins died per year due to gillnet entanglement from 2001–2003, out of a population of only 70–100 individuals. Freshwater cetaceans are also killed by electric fishing and dynamite fishing. Indus river dolphins also occasionally die after becoming trapped in irrigation canals, while Yangtze river dolphins are killed by boat propellers and blasting of river channels to improve navigation.

Poaching, hunting, and capture: While many river dolphin populations are protected by local people, some are deliberately hunted for their meat and oil, which are used as fish bait and as an emulsion to protect boats from water. They are also occasionally hunted for their body parts, which are used in traditional medicine. In addition, the animals are sometimes killed by fishermen in retaliation for 'stealing' fish. Irrawaddy dolphins are also caught live for display in oceanaria. Twenty-two of the 50 individuals caught since
1974 originated from the Mahakam River, placing increased pressure on the remaining population of just 33–50 individuals. Yangtze river dolphins were also caught for similar

purposes in the past.

Sense of conservation among locals: In recent years locals have been encouraged to stop fishing and to use home-made organic compost instead of chemical fertilisers and they have been taught how to build small, basic sewage treatment facilities. The results have been striking: since the early 1980s the dolphin population has more than doubled from 20 to about 55 animals. Everywhere else along the Ganges the population has fallen. Deliberate killing of Ganges River dolphins for meat and oil is believed to have declined in most areas, but it still occurs in some locations. The demand for these products means that there is little incentive for fishermen to reduce the bycatch or to release dolphins that are still alive when found in nets[5].

Efforts taken by WWF to reduce threats to freshwater cetaceans in the wild:

River dolphins are 'flagship' species for their habitats — charismatic representatives of the biodiversity within the complex ecosystems they inhabit. Efforts to safeguard these cetaceans will not only help save many other species, but will directly contribute to human development and survival by ensuring the availability of adequate and clean freshwater.

River Dolphin Initiative: In 2005, WWF launched a new River Dolphin Initiative. With 40 years of experience in cetacean conservation, WWF is working with governments, other non-governmental organizations, industry, fishermen, and local communities.

Examples of current work to conserve freshwater cetaceans include:

1**. In India,** WWF coordinated a survey of Ganges river dolphins and the threats they face. To mitigate the identified threats, WWF is encouraging local communities along a 164km-stretch of important dolphin habitat in the upper Ganges River to use natural fertilizers; not to dispose of domestic sewerage in the river; to improve sewerage management; to reforest the river bank; and to ban commercial fishing and sand-mining activities. WWF is also monitoring dolphin populations and threats in important dolphin habitats in other areas of the country.

2. **In Pakistan**, WWF coordinated the largest-ever population survey of the Indus river dolphin, and is working to assess water and sediment quality, studying bioaccumulations of toxic chemicals and heavy metals in the dolphin's prey species. Dolphin habitat is being improved by changing existing agricultural practices. WWF also conducts rescues of dolphins stranded in irrigation canals. As part of plans to modernize Taunsa Barrage, WWF is discussing the development of dolphin corridors and improvement of existing fish ladders to allow dolphins and fish to cross the barrage. Various steps have been taken to enhance awareness and train local stakeholders for improved species management.

Sandeep Behera, the World Wildlife Fund official leading the conservation programme, says that the dolphin's resurgence in this small area bodes well for other flora and fauna, including humans. "If you see a dolphin you know the water is good enough to drink," Hence conserving river dolphin means conserving nature, preserving water and providing good environment for flora, fauna and human to live.

To conclude Dolphins have lived in close proximity with humans for ages. It is so common to hear stories of dolphins saving stranded sailors and shipwrecked people. These wise creatures are also being used to treat autistic and mentally challenged children. And if they were to die of human selfishness, that would be the most shameful event in history. Given their choosy habits of clean water and hygienic food, their presence itself is an excellent indicator for the purity of the water bodies and environment. To provide the dolphins their right to live, is actually to keep ourselves alive free from the claws of pollution. Hence it becomes mandatory to conserve these creatures.

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