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Perspective Chapter: Status of Dolphin in the Maritime Area of Bangladesh

Md. Muzammel Hossain

Abstract

The aquatic mammalian species is the best indicator for the health of water specially dolphins. Due to human anthropogenic activities, dolphin survival rate and movement are reduced. The dreadful conditions of coastal habitats can have major concerns for dolphin population and distribution. Some dolphins swim in a short distance and some swim in a long distance. Southeast Asia is a significant geographical region for dolphin conservation. Several dolphins are highly important for the maritime area of Bangladesh that were sighted in the coastal and marine water such as Irrawaddy dolphin, Indo-Pacific Humpback dolphin, Bottlenose dolphin, Spotted dolphin, Spinner dolphin, and Ganges dolphins. Marine protected area (MPA) is a valuable zone for dolphin conservation as well as biological species. This primary information of dolphins helps for further investigation in the Bangladeshi water. The research action plan must be considered with coastal habitat, marine protected area and fishing community to conserve dolphins. We should be concerned about dolphin conservation through local and international community to develop the environment and the blue economy. Local community directly involved in the maritime area due to livelihood opportunities.

Keywords: aquatic mammal, dolphin, habitat, conservation

1. Introduction

Among the cetacean, the dolphin is the common name of aquatic mammals. Over the last decades, aquatic mammal conservation is a global concern due to human anthropogenic activities and rapidly declining the biodiversity. Losses of aquatic mammals or biodiversity directly affect on ecosystem locally or internationally that concerned by the Convention of Biological Diversity (CBD) in 1992. Marine mammal conservation is continuing process which cannot ever be well-thought-out completely in south Asia. In the Bay of Bengal, Swatch of No-ground has been established as Marine Protected Area (MPA) for biological species. As a big delta basin Ganges, Brahmaputra, and Meghna river systems are present along with the coastal regions in Bangladesh. IUCN Bangladesh [1] reported 10 cetacean species are present in the aquatic ecosystem of Bangladesh include the Ganges river dolphin. All marine dolphins are included in the Family Delphinidae. The very little study occurred on

the dolphins in the maritime area of Bangladesh, except some reports of species events [2–8]. According to WCS [9] about 1738 km² areas are considered as a marine protected area (MPA) for marine mammal species, and MPA is constructed at the Northwest and Southeast geographic area of Bangladesh that is recognized with the Indian Ocean in **Figure 1**.

However, some author little studies completed on dolphins [7–12] but the status of dolphin investigation is not sufficient in the maritime area of Bangladesh due to lack of funds, strategic plan, and awareness. Although, False Killer whale, Bryde’s whale, and Sperm whales are found in the marine water but different types of dolphins are survived in maritime areas of Bangladesh.

2. Dolphins in the maritime area

The species conservation effort should be a concern with ecological, behavioral, population, and species diversity. Among the mammal Irrawaddy dolphin, Indo-Pacific Humpback dolphin, Bottlenose dolphin, Spotted dolphin, Spinner dolphin, and Rough-toothed dolphin are present in the maritime area of Bangladesh in **Figure 2**. Only Ganges river dolphins survive in the freshwater, coastal water, and the mouth of the Ganges at Sundarban area.

2.1 Irrawaddy dolphin

This dolphin name comes from the Irrawaddy River, Myanmar and endangered species among all cetacean species in the world. Its scientific name is *Orcaella brevirostris* and its local name is the Iraboti dolphin. This dolphin is considered Vulnerable globally and Near Threatened in Bangladesh due to anthropogenic activities. Irrawaddy dolphins are critically endangered. Species color is gray to dark slate blue, paler underneath, rounded, and small dorsal fin present; the flipper is rounded and wide. About 451 individual Irrawaddy dolphins were sighted near the coastal water of Sundarbans mangrove forest [12]. This dolphin is very similar to the finless porpoise and fishes, crustaceans, and invertebrates are main food [13]. In the coastal region, they are more limited although survive around South and Southeast Asia. According to Smith et al. [14] the 779.7 km of trackline and a 16,779 km² study

Figure 1.
Map of dolphin occurrence in the maritime area, black color line box indicated site (WCS, 2015).

Figure 2.
Different types of dolphin occurred in the maritime area of Bangladesh. (1) Irrawaddy dolphin, (2) Indo-Pacific Humpback dolphin, (3) Indo-Pacific Bottlenose dolphin, (4) Spotted dolphin, (5) Spinner dolphin, and (6) Ganges river dolphin.

area were investigated, an abundance of Irrawaddy dolphin was assessed 5383 (CV = 39.5%) in the maritime water in Bangladesh including number (n) was 75, mean group size was 2.2, SD 1.8, dolphin range was 1–10. Also, large populations of Irrawaddy dolphins were recorded in the marine coastal water of Bangladesh. The reported number of Irrawaddy dolphins 114 from 2004 to 2014 [15] and UNDP Bangladesh [16] also stated a total number of 451, respectively in the Sundarban mangrove region of Bangladesh in **Figure 3**. Smith et al. [12] reported the encounter rate of dolphins as 0.19 in the Sundarban area, Bangladesh whereas a similar encounter of 0.16 showed at the Ayeyarwady River in Myanmar [17]. The Sundarbans and their adjacent areas are major and hotspot areas for the Irrawaddy Dolphin and half of the population are present in the maritime area of Bangladesh. Based on IUCN Red List in Bangladesh and India, this species is Vulnerable, but Critically Endangered species in Laos, Myanmar, Malaysia, Thailand, and Philippines.

2.2 Indo-Pacific Humpback dolphin

The Indo-Pacific humpback dolphin has been recorded in the marine water of Bangladesh and also sighted near the eastern India region [18]. This species scientific name is *Sousa chinensis* and its local name is Golapi dolphin. The highest size recorded

Figure 3.
Number of species sighted in the maritime water of Bangladesh.

280 cm, healthy body, and extended beak. Color outline differs with age and area. Color show bluish gray to light cream or pink. This dolphin shape is very similar with the bottlenose dolphin. Color, dorsal fin, and head size separate them. Humpback dolphin usually swims in groups. They are survived in the tropics and subtropics area of coastal water and small fishes are major food. The marine water environment of Southeast Asia is a significant habitat for this dolphin but this species population, distribution, abundance, and feature of habitat very little study has been done to ensure survival species [19–21]. World Conservation Society [9] remarks the area about 327 km² of importance habitat for humpback dolphins encompassing 73% of sightings in coastal waters near the mangrove forest. Also, at the 24.73°–24.33°N geographic site, this dolphin sighting per unit effort was 3.88 [22, 23]. WCS was assessed humpback dolphins survive in shallow water and coastal waters in the Bay of Bengal but most of the species occur in the northern Indian and eastern Pacific oceans. According to the IUCN Red List this species is Near Threatened but presently like remark as vulnerable. Most of the humpback dolphins swim in the marine protected area (MPA).

2.3 Indo-Pacific Bottlenose dolphin

This mammal scientific name is *Tursiops aduncus* and its local name is the Botolnak dolphin. The highest size recorded 250 cm; also have a snout, large flipper, dorsal fin, and flukes. The color outline is gray and marginally dark present. Although, about 402 Indo-Pacific bottlenose dolphins are sighted from 2004 to 2014 and also large population was recorded in the marine protected area in **Figure 3**. WCS [9] reported about 1700–2200 individual Indo-Pacific bottlenose dolphins that survived in the Bangladesh area. This species is also sighted in the face of the Swatch-of-No-Ground which is a highly biological habitat in the Bay of Bengal. Although, IUCN considers the species as data deficient (DD) but due to their distribution and population remark as vulnerable in the environment of the Bay of Bengal. Fisherman occasionally caught this dolphin by gillnets and seines net during fishing. WCS considers about 282 km² as Marine Protected Area (MPA) for this dolphin whereas 90% of species are sighted.

2.4 Spotted dolphin

The spotted dolphin is the most dominant animal in the cetacean groups in tropical area. Generally, Pantropical spotted dolphins occurred in the marine protected areas of the Bay of Bengal. This dolphin's scientific name is *Stenella attenuate* and its local name is Chitra dolphin. Its body structure is slender and looks like streamlined. The dorsal fin is narrow and pointed at the tip. The spot is present in adult dolphins. The abdomen color is a brighter gray. Maximum sizes of spotted dolphins found about 260 cm long. WCS reported 29 sightings of spotted dolphins and an average group size of 84 in the marine protected area (MPA) [9]. The spotted dolphin population is reducing due to unplanned fishing in the Bangladesh region. IUCN is considered as least concern and very little study occurred in Bangladesh on this dolphin. In the Swatch-of-No-Ground, about 86% of spotted dolphins occurred due to well biological habitat and 263 km² areas considered as MPA for this species.

2.5 Spinner dolphin

The Spinner dolphin's scientific name is *Stenella longirostris* and the local name is Ghurni dolphin. This dolphin's body shape is slender with a particularly long beak. Adult spinner dolphin's maximum size recorded is 240 cm. Generally male is larger than female. Triangular to curved shape present in the dorsal fin. Three types of color are present in Spinner dolphin. The dorsal cape is dark, body sides are light gray, and belly is white. This dolphin is show leaping and spinning activities. Usually, this dolphin survives in the tropical and subtropical waters at geographical areas 40°N and 40°S. Large group of populations are swim in the marine protected area. Some fisheries reported a yearly mortality rate of about 100–1000 dolphins in the marine water due to fishing interaction. Although, IUCN was considered as data deficient but WCS [9] reported 34 sightings and an average group size of 97 in the Swatch-of-No-Ground and 550 individuals was present. Sighting rate 91% in the marine protected area and 263 km² areas consider for conservation.

2.6 Ganges river dolphin

This dolphin scientific name is *Platanista gangetica gangetica* (Roxburgh, 1801) and local people call “shusuk” as local name in Bangla. A total of 34 sightings of dolphin, mean density was 0.38 (SD ± 0.37) dolphins/km² and best-high-low estimated of 10–12–8 in November 2012 in the Buriganga River area [7]. Also, 62 sightings of dolphins and best-high-low estimated of 9–11–7 in august, monitored by October with 8–10–7 individuals in the Turag River [8]. Another one reported encounter rate of Ganges dolphin was 0.47 in Sundarbans area in **Table 1**. Dolphin group size estimated by the Lincoln-Petersen model and Huggins conditional likelihood model which abundance showed 196 individuals (CV = 12.7%) and 225 individuals (CV = 12.6%), respectively in mangrove channels of the Sundarbans area [12]. It is a freshwater dolphin species scattered throughout the Ganges, Brahmaputra, and Meghna river systems along with the coast area of Bangladesh, Nepal, India, and conceivably Bhutan and 266 dolphins encountered in the entire Brahmaputra river system [11, 26, 27]. In the Indian subcontinent, Ganges dolphin is a special aquatic mammal in the riverine ecosystem. The survey was conducted for Ganges dolphins especially in Turag River and Buriganga River that is a part of the Ganga basin. Department of Environment, Government of Bangladesh Turag and Buriganga River area consider

Geographic area	Encounter rates	Reference(s)
Sundarbans area	0.47	[12]
Sangu River, Bangladesh	1.36	[11]
Karnaphuli River, Bangladesh	0.47	[11]
Buriganga River, Bangladesh	0.38	[7]
Chambal River, India	0.27	[24]
Bhagirathi River, India	0.37	[25]

Table 1.
Encounter rates of Ganges river dolphin.

as “Ecologically Critical Area (ECA)” [28, 29]. This species is enlisted in the CITES and Bangladesh Wildlife (Conservation & Security) Act, 2012, and it is categorized as an endangered species due to the many anthropogenic activities and natural hazards included, such as, water pollution, traffic boat and ship, brickfield, industrial waste, water level reduce.

3. Threats and conservation

Mortality of dolphins in fishing nets and the highest level of water pollution through oil, plastic, and industrial waste are the extreme threats. Illegal fishing such as poisoning or electro fishing and large ship boat, vessel strikes, overfishing, sand and resources mining are also threat for dolphins. In Bangladeshi water, most of the dolphin species death occurs by fishing net specially gill net. Dolphin killing and hunting was extensive in several countries that also threat for the environment [2, 30, 31]. UNDP Bangladesh [16] reported that 130 dolphins were killed from 2007 to 2016 in the waters of Bangladesh which most of the species’ death by fishing nets and propellers of ships. GoB [32] also reported a total of 52 dolphins were lost by gillnets in the Sundarban area. Dolphin killing occurred due to collecting body parts has required in fisheries that are used as dolphin oil [33]. Although, several organizations are trying to conserve dolphins but it’s not enough, such as SharkLab, United Nations Development Program (UNDP), the Global Environment Facility (GEF), the Forest Department, IUCN Bangladesh, and World Conservation Society (WCS). Dolphin conservation is highly important for other aquatic species in the ecosystem as well as the better health regulator of water. Bangladesh Government has been attentive for the marine protected area (MPA) to conserve cetaceans whereas most of the dolphin sightings occurred in the water. We should concern about bycatch through fishing gear, awareness, and biological data monitoring to conserve dolphins as well as their habitat. Six sanctuaries have been recognized as conservation areas by the Government of Bangladesh for marine mammal and other species. The Swatch of no-Ground is also known as a special conservation area for biological resources.

4. Conclusions

The present condition does not well promise for the future plan of the dolphins. The different key programs should consider improving dolphin conservation. Such

as taxonomy study through morphologically and genetically, impact and risk assessment, habitat management assessment, ocean traffic plan, population size and movement, ecology, water quality, environmental hazards and threat, etc. Also season wise fisheries interaction should high attention because dolphin mortality rate increases due to fishing and human anthropogenic activities. Monitoring programs of dolphins, their primary habitat, size, structure, and population can guide or lead delta plan, conservation plan, and climate movement.

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