



THE SUNDARBANS AND CLIMATE CHANGE

An evening of confusing colors © Sagar

ABOUT THE SUNDARBANS

The Sundarbans is the largest mangrove forest on Earth. Located at the edge of West Bengal in India and Bangladesh, it covers 9,630 km². The Ganges, Brahmaputra and Meghna rivers flow through this system and create the world's largest delta. Large parts of this are designated as Ramsar Sites, wetlands of international importance, while the Indian side has been a UNESCO World Heritage Site since 1987.

Mangroves are tropical plants, which grow where the land meets the sea. They have special adaptations such as tolerance to salt and breathing roots. This particular mangrove forest is the only one to host the Bengal Tiger (*Panthera tigris tigris*) as well as the Ganges River Dolphin (*Platanista gangetica*), Irrawaddy Dolphin (*Orcaella brevirostris*), the Indian Python (*Python molurus*), the Estuarine Crocodile (*Crocodylus porosus*) and around 260 different bird species, including several migratory ones, such as the Spoon-billed Sandpiper (*Calidris pygmaea*). It is also home to many fishes, including the migratory Hilsa (*Tenualosa ilisha*).

Not only is this region rich in biodiversity, but it is also important for four million humans, who reside in the Sundarbans and who benefit from ecosystem services they provide. There are 102 islands in the Sundarbans Delta and 48 of them are inhabited by humans engaging in fishing, agriculture and the collection of wood and honey. Agriculture is critical for these communities; however, local practices and high dependency on seasonal rainfall mean that the mangroves and their resources provide an important alternative source of livelihoods for these people.

Threats due to climate change

Climate change is affecting the Sundarbans in various ways. Firstly, rising sea levels are posing significant threats to these delicate ecosystems. The volume of water in the oceans is increasing due to thermal expansion and the addition of considerable amounts of water due to the melting of polar ice caps and glaciers. The average elevation of the Sundarbans is lower than one metre above sea level, meaning that this region is highly susceptible to flooding. Due to this, any swelling of ocean water is going to dramatically affect the area. Though mangroves are somewhat resistant to submersion in water, they can die when tidal inundation occurs too frequently or lasts too long.

Frequent and persistent flooding also causes coastal erosion, which can result in the decline of the total land area. The recent disappearance of some of the delta's islands is of concern for the future of many other islands in the area. These events cause people to emigrate, becoming environmental refugees who will eventually cause population pressures in neighbouring regions and urban centres. The disappearance of these islands also severely threatens the survival of the eclectic mix of biodiversity in the region. For instance, it has been estimated that a 28-cm sea level rise above levels of the year 2000 would result in a 96 per cent decline of the Bengal Tiger's habitat in Bangladesh. These threats are increasingly worrying as the rise in sea level is currently 3.2 mm per year.

The rise of saline water into areas of the Sundarbans that are not tolerant to these conditions is also of concern. Excess levels of soil salinity can be incredibly damaging to ecosystems as salts can accumulate in the soil and hinder plant growth. It also threatens the health of freshwater aquatic life such as fish and giant prawns. The rise of ocean levels has been observed pushing the saline water upstream into estuaries and rivers, forcing freshwater life into the last remaining saline-free waters available. In addition, salinity intrusion decreases the suitability of freshwater sources available for agricultural crop irrigation and drinking water.

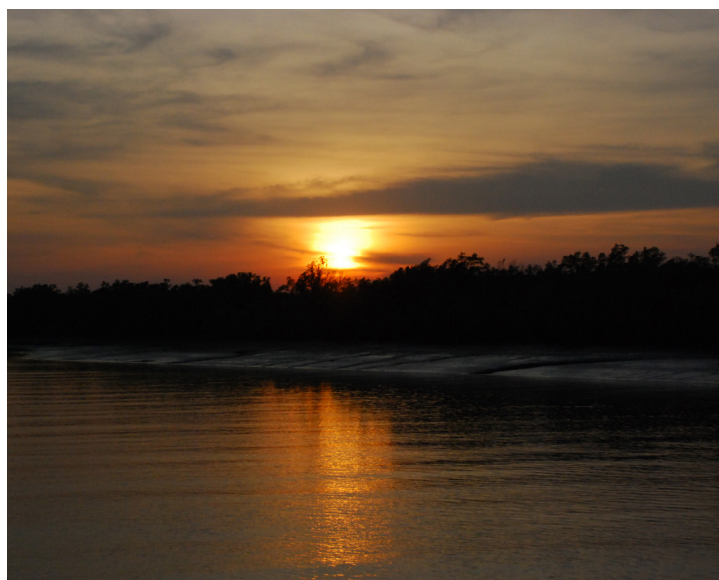
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Threats due to climate change

The Sundarbans are in an area of the world that regularly experiences major tropical cyclones. These storms are similar to hurricanes and threaten the habitats of many species and human existence, especially in low elevation areas of the Sundarbans. The rise in sea levels and temperature is thought to intensify these storms as wind speeds and precipitation levels are continually increasing. The Bengal Tiger is one of the species living in the Sundarbans, they are also disturbed and affected by the storms because the availability of their prey has declined. Furthermore, loss of the intertidal mudflats is expected to have major impacts on habitat availability for migratory and resident waterbirds and other fauna.

There is existing evidence to show that climate change is causing warmer atmospheric temperatures which result in higher rates of evaporation and increased levels of water vapour in the atmosphere. This phenomenon is now causing higher levels of precipitation and volatile weather patterns. The monsoon season in particular has been considerably erratic in recent years, resulting in unpredictable damage to the environment and agricultural lands in the Sundarbans region. Climate specialists have predicted that as climate change progresses, monsoon seasons in the Sundarbans will become longer and more intense. Conversely, drought conditions will also become more pronounced, presenting further challenges for agricultural producers in particular and ecosystems in general. It is uncertain whether the ecosystems, species and local inhabitants of the Sundarbans will be able to adapt to these changing and erratic conditions.

Long-term coastal planning is needed to ensure that these critically important intertidal habitats, with their unique flora and fauna, and local inhabitants have the space to retreat inland unhindered as the water levels rise in the future.



Photos: Sunset at the Sundarbans © Sayamindu Dasgupta; Archive: Ganges River Delta (Archive: NASA, Space Shuttle, 11/19/05) © NASA's Marshall Space Flight Center

About CMS

The Convention on the Conservation of Migratory Species of Wild Animals (CMS), also known as the Bonn Convention, works for the conservation of a wide array of endangered migratory animals worldwide through negotiation and implementation of agreements and species action plans. It has 130 Parties (as of 1 February 2020).

CMS engages all relevant stakeholders in addressing threats to migratory species in concert with all other aspects of wildlife conservation and management.

CMS Instruments

Animals receive protection under CMS through listing on its two Appendices, through global or regional agreements and through action plans.

Contact



UNEP / CMS Secretariat
UN Campus
Platz der Vereinten Nationen 1
D-53113 Bonn, Germany
Tel: (+49 228) 815 24 01/02
Fax: (+49 228) 815 24 49
E-mail: cms.secretariat@cms.int
www.cms.int

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