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CHANGE initiative

POSITION PAPER

RISING TIDES, ROARING FUTURES: THE SUNDARBANS' QUEST FOR SURVIVAL

About Change Initiative

The Change Initiative (CI) is an emerging organisation dedicated to research and evidence generation as well as pushing for innovative governance and integrity to find creative solutions and be a pioneer of change.

CI was established with the aim to carry forward with the prime objective of expediting the process of founding a society premised on equity, justice, and wellbeing.

The name 'Change Initiative' (CI) represents the goal of embarking on the journey of contriving an alternative research paradigm beyond the orthodox modalities.

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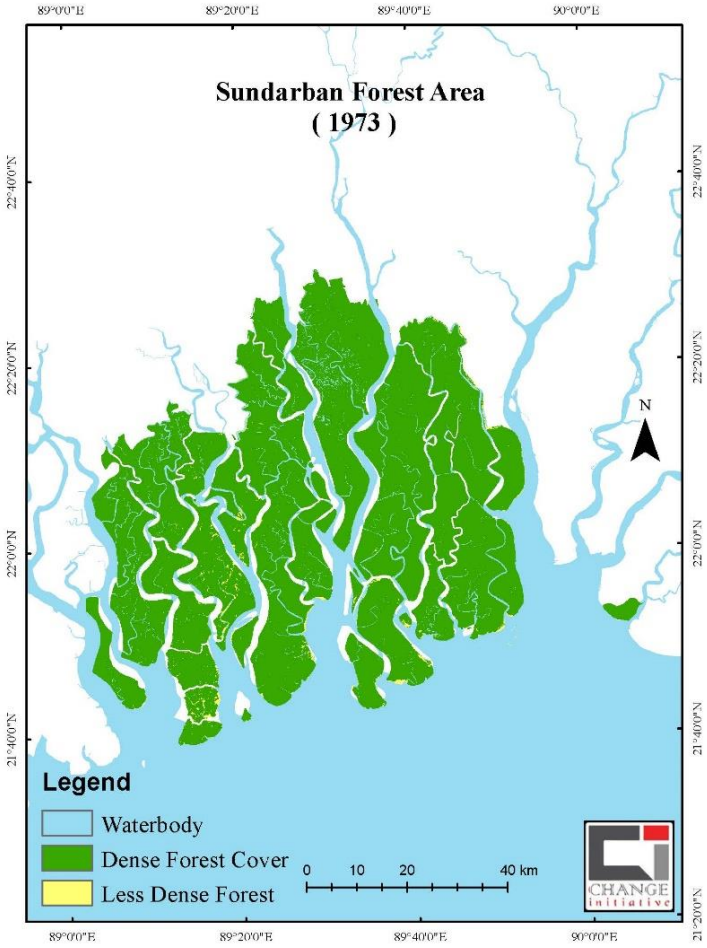
RISING TIDES, ROARING FUTURES: THE SUNDARBANS' QUEST FOR SURVIVAL

Situated at the deltaic confluence of three great Asian rivers—the Ganges, Brahmaputra, and Meghna—the Sundarbans is a testament to nature's resilience and complexity. Spanning approximately 10,000 square kilometers (about half the area of New Jersey), this labyrinthine network of tidal waterways, mudflats, and small islands is predominantly situated in Bangladesh, with a smaller portion extending into India. The topographic and ecological uniqueness of this area earned it the designation as a UNESCO World Heritage Site, attesting to its global environmental significance and the imperative for its conservation.

The Sundarbans mangrove forest covers an area of about 10,000 km2 (3,900 sq mi), of which forests in Bangladesh's Khulna Division extend over 6,017 km2 (2,323 sq mi). The most abundant tree species are Sundari and Gewa. The forests provide habitat to 453 faunal wildlife, including 290 birds, 120 fish, 42 mammals, 35 reptiles, and eight amphibian species.



The decline of the Sundarbans' forest cover over the past five decades has been depicted through a chronological analysis of land cover changes from 1973 to 2024. In 1973, the Sundarbans boasted a dense forest cover that constituted 94.2% of the area, reflecting a robust mangrove ecosystem. The cartographic analysis of the Sundarbans Forest Area in 1973, as depicted in the provided map, offers an historical baseline for understanding the extent of mangrove coverage prior to the subsequent decades of ecological change.

STATUS OF THE NATURAL SHIELD

Decline of Forest Coverage and Land Mass: By 2024, this figure had diminished to 91.5%. Although the decrease may seem marginal at first glance, it translates into a significant loss of dense mangrove habitat when considering the extensive scale of the forest. This loss is not merely numerical value but symbolizes the retreat of a critical ecological stronghold that provides vital services, ranging from carbon sequestration to coastal protection and biodiversity sustenance.

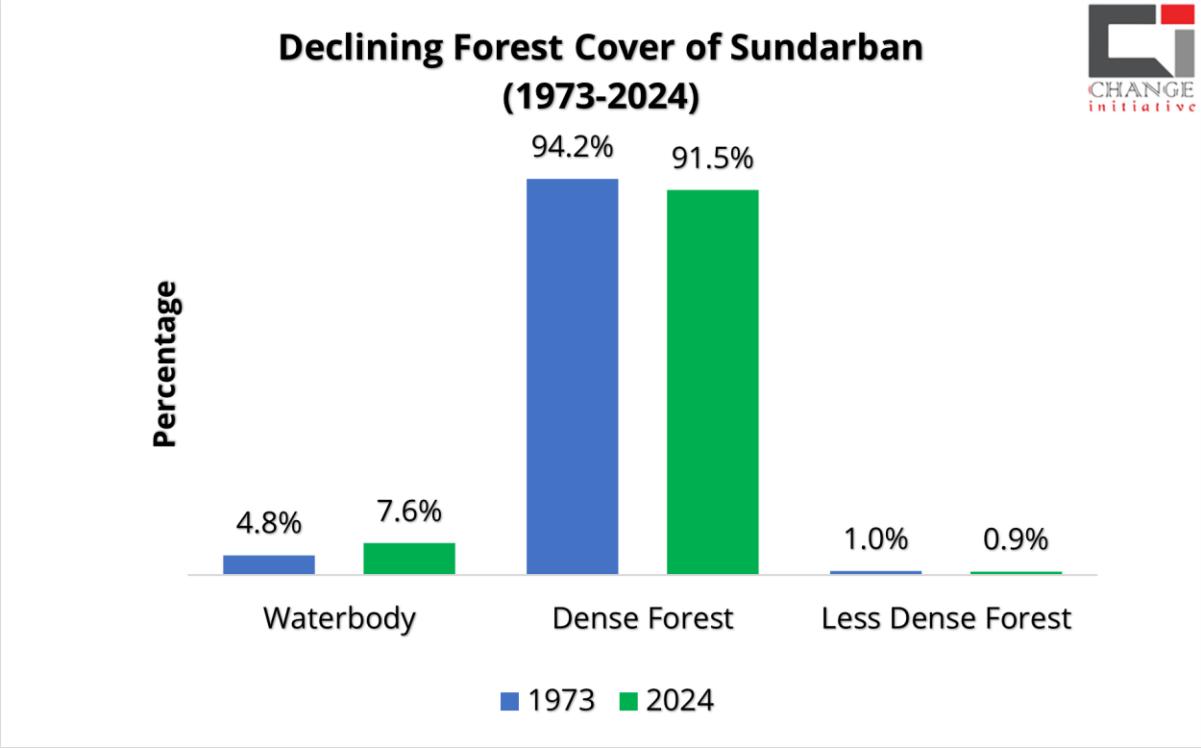


Figure 11: Declining Forest Cover in Sundarban

The less dense forest, while occupying a smaller fraction of the land cover, shows a slight decrease from 1.0% to 0.9%. This reduction, albeit minor, further corroborates the trend of declining forest robustness and could be indicative of the degradation of forest quality or transitional stages towards other land cover types, possibly due to anthropogenic pressures or natural forest dynamics.

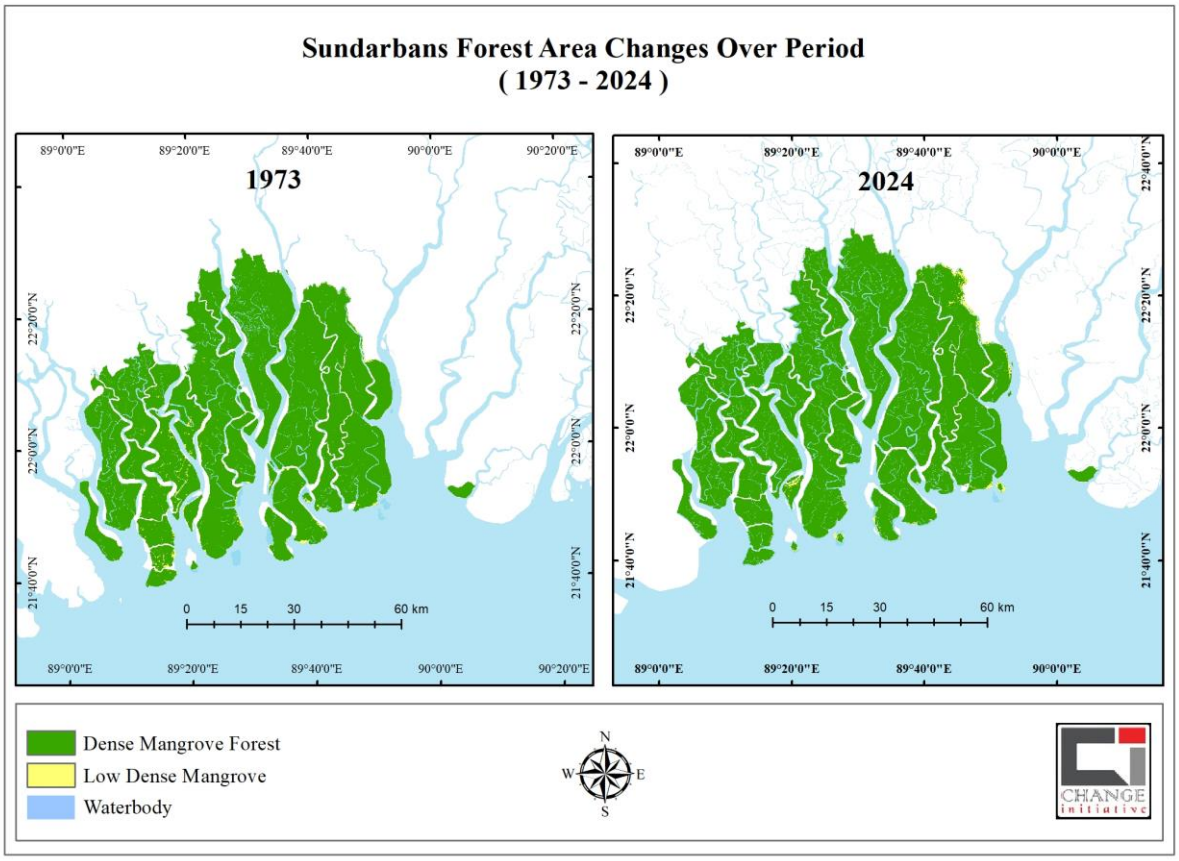


Figure 22: Side by side Comparison of Sundarbans Forest cover

Figure 3 presents a comparative cartographic representation of the Sundarbans Forest Area changes between the years 1973 and 2024, visualized through two side-by-side maps. The observed changes likely driven by factors including climate change-induced sea-level rise, hydrological shifts, and anthropogenic impacts such as deforestation and land use change, highlight the critical need for longitudinal studies to understand the factors contributing to these changes and to develop strategies to manage and conserve the unique biodiversity and ecosystem services provided by the Sundarbans.

Rise of the water bodies: Concurrently, the data exhibits an incremental rise in waterbody coverage, expanding from 4.8% to 7.6% over the same period. This increase could be attributed to many factors including sea-level rise due to global warming, increased riverine erosion, and the natural sedimentary dynamics of the deltaic region. The expansion of water bodies at the expense of forest cover is a cause for environmental concern, as it may lead to habitat fragmentation and loss of biodiversity. In 2015-16, the total area of the Sundarbans had shrunk by 210 km^2 since 1967, and by 451 km^2 since 1904. This declining trend holds true whether the Indian and Bangladesh portions of the Sundarbans are considered separately or grouped together.

Increase of Tiger Population: According to the Forest Department of Sundarbans East Division, 22 tigers died in between 2001 and February 3, 2020, in that part of the forest. Among those, 10 were killed by miscreants, five were lynched, six died normally, and one tiger died during Cyclone Sidr in 2007. The first-phase survey of the USAID BAGH project recorded 106 tigers in 2015. According to a census, Bangladesh Forest Department jointly with Wild team and the Smithsonian Conservation Institute, USA (2018), found that the number of Royal Bengal Tiger in Bangladesh part of the Sundarbans has increased to 114 from 106. That means about 0.38% increase of tiger density compared to the assessment of 2015.

Decreasing Shundori trees: Shundori trees, also known as Sundari trees (Heritiera fomes), are indeed declining in the Sundarbans, which is a matter of concern for the ecosystem and biodiversity of the region. Sundari trees are specially adapted to thrive in brackish water conditions. However, rising sea levels and increased salinity intrusion, exacerbated by climate change, are altering the hydrological balance of the Sundarbans. Illegal logging activities, driven by demand for timber and other forest products, pose a significant threat to Sundari trees. Unsustainable harvesting practices lead to the depletion of Sundari populations and disrupt the natural regeneration process. A study looking at the coverage of mangrove forests between 1975 and 2020 found that mangrove forests have been decreasing in density by an estimated annual rate of 1.3%.

Growing poisoning in canals putting Sundarbans marine life at risk: In the 6,017 sq km Bangladesh part of the Sundarbans, there are 210 species of white fish, 24 species of shrimp, 14 species of crabs, 43 species of Mollusca and one species of lobster. Sundarbans marine resources, including fish and crustacean stocks, are depleting due to indiscriminate use of poisonous substances for fish baits. Some fishermen and pirates in the Dangmari, Moraposhur, Jengra, Jhapshi, Bhadra Kamal, Harin Tana, Kokilmuni and Harbaria areas were involved in poisoning the fishes. This practice also results in the poisoning of other aquatic animals, and the toxins enter river water, endangering the entire mangrove forest ecosystem.

Every kind of marine life is being affected and as a result doing serious damage to the forest. There are around 450 rivers sprawling over the forest area, home to at least 475 fish species. Moreover, animals in the forest like tigers and deer were falling sick after drinking the poisoned water. This also destroyed the ecosystem of Sundarban.

Reluctance in Protecting the Natural Resources of Sundarban: Due to not having proactive efforts to protect the ownership of the naturally endowed resources of the Sundarban India has claimed the Geographical Indication (GI) rights for 'Sundarbans honey' presents a challenge for Bangladesh, as the Sundarbans primarily lie within its territory, with around 60% located in Bangladesh.

Establishment of thermal coal plant and risky infrastructure: Despite the credible risks of the thermal power plant on the forest ecosystems the Rampal coal power station was established near the largest Sundarbans mangrove forest. The operation of the coal power station would release various pollutants into the air, including particulate matter, sulfur dioxide, nitrogen oxides, and heavy metals. The coal power station requires large quantities of water for cooling purposes. Discharge of heated water back into the surrounding water bodies can raise water temperatures and disrupt aquatic ecosystems, affecting fish and other aquatic organisms in the Sundarbans. Coal combustion generates large amounts of ash, which contains toxic substances like arsenic, mercury, and lead. Improper disposal of coal ash can contaminate soil and water resources, potentially affecting the health of plants, animals, and humans in the Sundarbans area. This can disrupt wildlife habitats and migration routes, leading to loss of biodiversity and ecological imbalance. Researchers estimate that there has been a loss of USD 3.3 billion in ecosystem services of the Sundarban Biosphere Reserve during the last 30 years, over 80% of which is provided by mangroves.

POTENTIAL SOLUTIONS TOWARDS SUSTAINABLE SUNDARBAN

Addressing the myriad threats faced by the Sundarbans requires a multi-faceted approach that combines local initiatives with global cooperation. Potential solutions may include:

Enhance Transboundary Cooperation: Building on the 2011 Memorandum of Understanding (MoU) on the Conservation of the Sundarban, India and Bangladesh should deepen their collaboration to include joint management of protected areas, coordinated conservation efforts, monitoring of wildlife populations and habitat conditions, and shared research initiatives.

Utilize Digital Monitoring Systems: Deploy advanced digital monitoring systems like drones for real-time surveillance to track illegal activities, monitor wildlife movements, and assess the health of the ecosystem. This includes adopting tools like MSTrIPES (Monitoring System for Tigers' Intensive Protection and Ecological Status) for tiger conservation.

Monitor and Manage Salinity Levels: Implement sensor-based technologies to continuously monitor salinity levels in waterways, enabling timely interventions to mitigate adverse impacts on mangrove and aquatic life.

Combat Illegal Poisoning, Fishing and Poaching: Introduce approaches and incentives to prevent poison fishing, such as providing alternative livelihoods to local communities and enhancing enforcement through community policing models.

Expand Protected Areas and Wildlife Sanctuaries: Increase the extent of protected areas within the Sundarbans, ensuring critical habitats are safeguarded from development pressures and human encroachment.

Revive and Adapt Historical Administrative Models: Consider reviving the role of the Sundarbans Commissioner, or a similar transboundary governance model, to oversee and coordinate conservation and development actions across the Sundarban region shared by both countries.

Promote Regional and International Agreements: Leverage frameworks like the Kunming-Montreal Global Biodiversity Framework to commit to protecting 30% of land and sea by 2030. This should include specific targets and actions for transboundary ecosystems like the Sundarbans.

Develop Regional Capacity in Wildlife Forensics and Data Sharing: Through networks like the South Asia Wildlife Enforcement Network (SAWEN), enhance regional capabilities in wildlife forensics and establish protocols for sharing data on illegal wildlife trade.

These strategies, grounded in regional cooperation, technological innovation, and sustainable development principles, represent a holistic approach to conserving the Sundarbans. By integrating these measures into the national biodiversity strategies and action plans of both countries, India and Bangladesh can ensure the long-term preservation of this vital ecosystem.