



The future of the Sundarbans mangroves in India

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The Sundarbans Biosphere Reserve is situated near Kolkata in the western part of the Ganges-Brahmaputra Delta. The Sundarbans mangroves together with the areas in Bangladesh are the world's largest mangrove forest and home to the iconic Royal Bengal Tiger. It is a Ramsar and World Heritage site. Over the last 20 years the mangroves have retreated from 10 to 50 m/yr along the open coast with the loss of 145 km² area of the biosphere reserve, 40% of which constitute the mangrove forest. This erosion reflects a response to waves in the Bay of Bengal and a relative sea-level rise of about 5 mm/yr since 1948 which increased further during the last decade. In percentage terms this observed forest land loss is manageable. However, it will continue and almost certainly accelerate with sea-level rise. As well as open coast erosion, inundation will also occur within the mangroves. Hence over many decades, Sundarbans mangroves will be progressively degraded endangering their iconic species. We are using these observed data and the Sea Level Affecting Marshes Model (SLAMM) to explore possible trajectories of the Sundarbans evolution under different sea-level rise scenarios and management interventions. The areas to the north are densely populated and increasingly influenced by the expansion of Kolkata. Discussions with stakeholders suggest a managed retreat does not seem feasible or practical due to the large displaced populations. The paper will discuss the interlinkages of the slow onset hazard in a sinking and shrinking delta to explore pathways to achieve sustainable outcomes in south Asian deltas.