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Potential inundation-driven changes in the value of coastal ecosystems in the Sundarbans region in Bangladesh

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Statement of the Problem: The western coast of Bangladesh, and in particular the Sundarbans region, contains one of the largest deltas in the World. The Sundarbans is vulnerable to many natural disasters such as cyclones, storms, and inundation, which will be exacerbated by climate change. This high vulnerability is due to the combination of its geographical location, low-lying nature of the area and high population density.

Purpose: The purpose of this study is to estimate the likely changes in the value of coastal ecosystem services of Sundarbans due to the impacts of climate change driven inundation by the year 2100.

Methodology & Theoretical Orientation: In this study, we use accepted economic valuation techniques combined with a newly developed scenario-based approach to guestimate the changes in ecosystem services value due to the impacts of possible inundation scenarios.

Findings: The results show that the worst case inundation scenario (caused by 1.77m relative sea level rise) results in a considerable loss of food provision service (up to \$24/Ha), compared to the changes in other ecosystem service values such as provision of raw materials, recreation and art services with losses of up to \$2.7, \$0.36 and \$0.005 per Hectare of the wetlands ecosystems.

Conclusion & Significance: Climate change driven inundation is likely to have a high impact on the value of food provision service (fish and marine species) of Sundarbans ecosystems highlighting this service as the most vulnerable ecosystem service that requires the attention of coastal and marine policymakers. The impact of inundation on other ecosystem services is markedly lower in the Sundarbans. Findings of this study may contribute to the sustainable management of the coastal zone in Bangladesh by highlighting the relative impact of climate change driven inundation on a range of coastal ecosystem services provided by the Sundarbans ecosystems.

Biography

Seyedabdolhossein (Abdi) Mehvar is from the Netherlands. Abdi graduated with a MSc in "Coastal Engineering and Port Development" from IHE Delft in 2014 and now is doing his PhD research with the title of "Quantifying climate change driven environmental losses on coasts" in IHE Delft and in the University of Twente in the Netherlands. His research interests include coastal zone management, climate change impacts on coasts, and economic valuation of coastal ecosystems.

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