# EO 4 Ecosystem Accounting 2022

Determining the Coastal Protection Value of Mangrove Ecosystems in Sundarbans, India, using SatEO

Pranav Pasari Satsense Solutions

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## Introduction

- Coastal zones are changing rapidly due to development and climate change, both of which dramatically increases risk.
- Ecosystems reduce exposure, yet their value is not recognized, they continue to be lost and degraded.
- Coastal protection value of ecosystems not always evident. Stakeholders not equipped to evaluate these ecosystem services.
- Project supported by Ocean Risk and Resilience Action Alliance (ORRAA).

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Image: Mangrove ecosystems reduce coastal risks

Ocean Risk and **Resilience Action Alliance** 



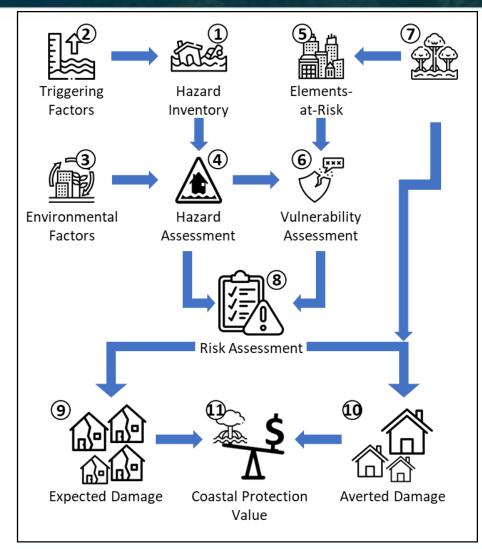




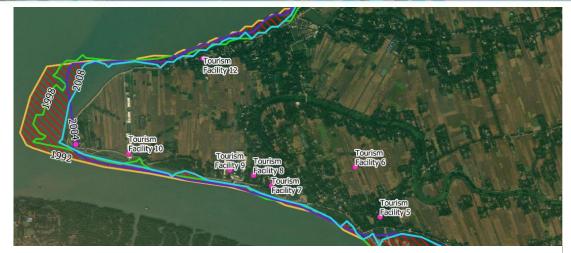


## Methodology

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Coastal Protection Value of Ecosystems – Schematic



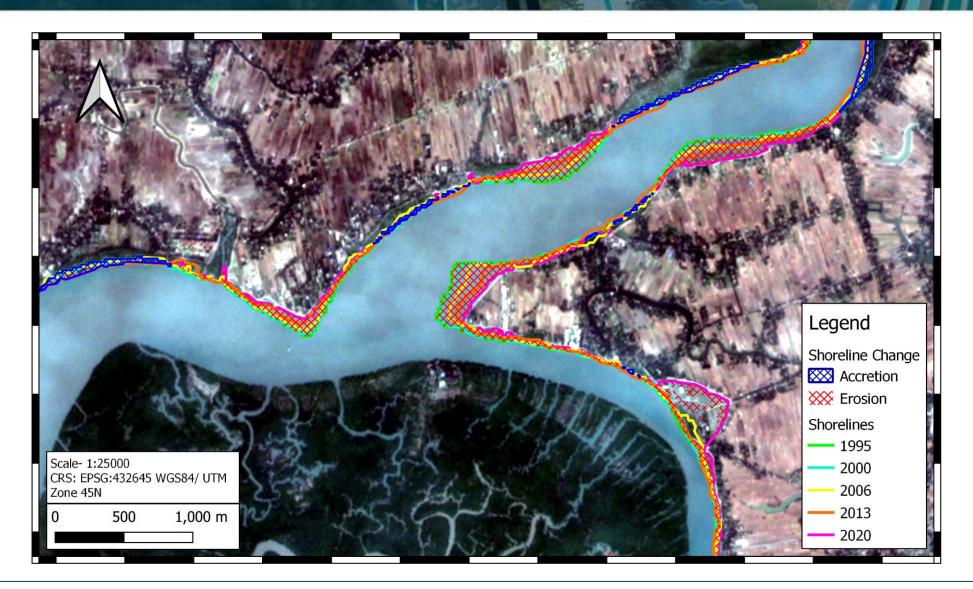
Hazard Inventory - Coastal erosion mapped from 1988 to 2020



Environmental Factors, Credit: A. Melet et. al 2020.

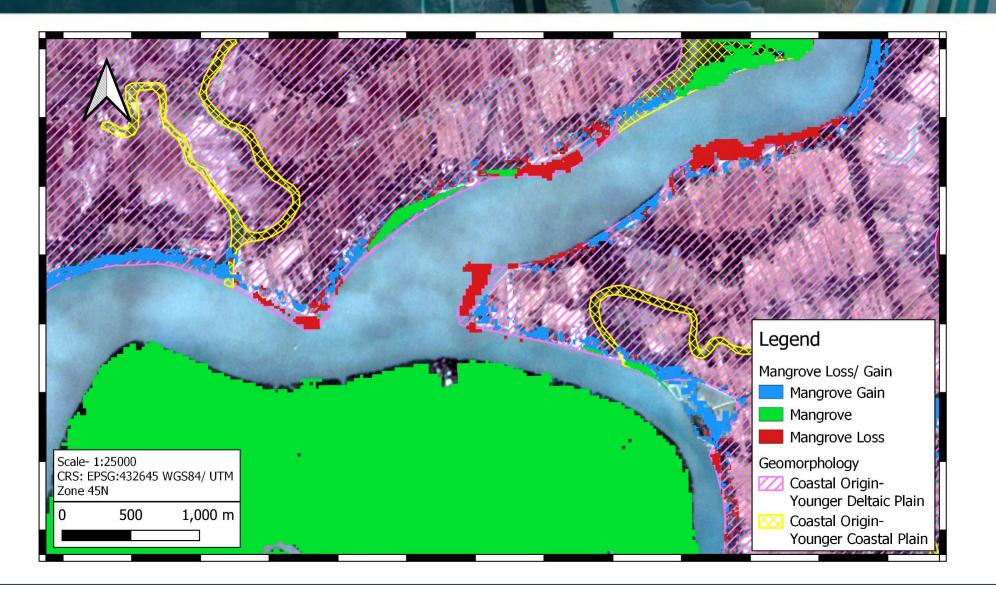
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## Hazard Inventory & Assessment



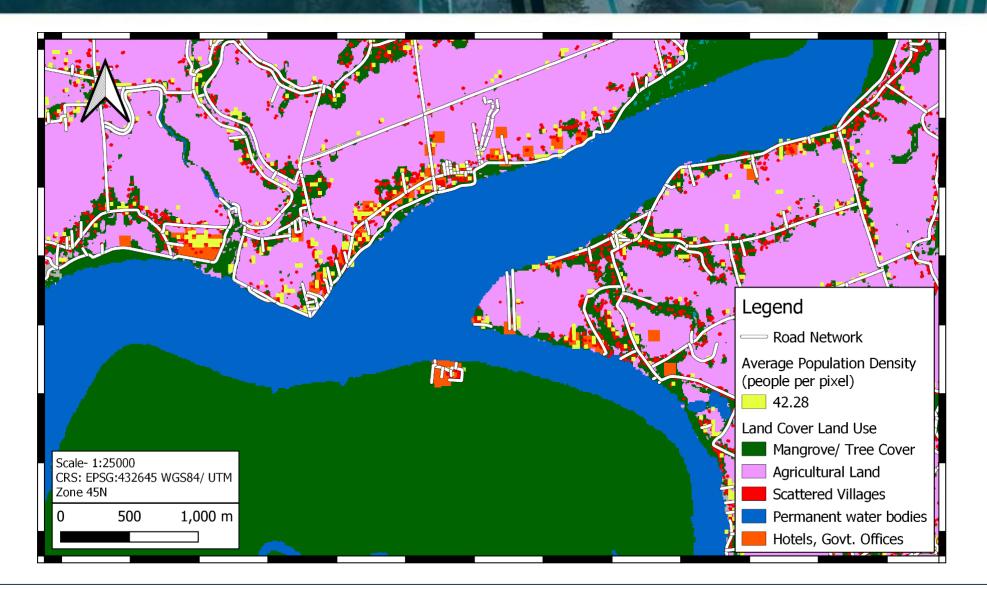
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## **Environmental Factors & Coastal Ecosystems**



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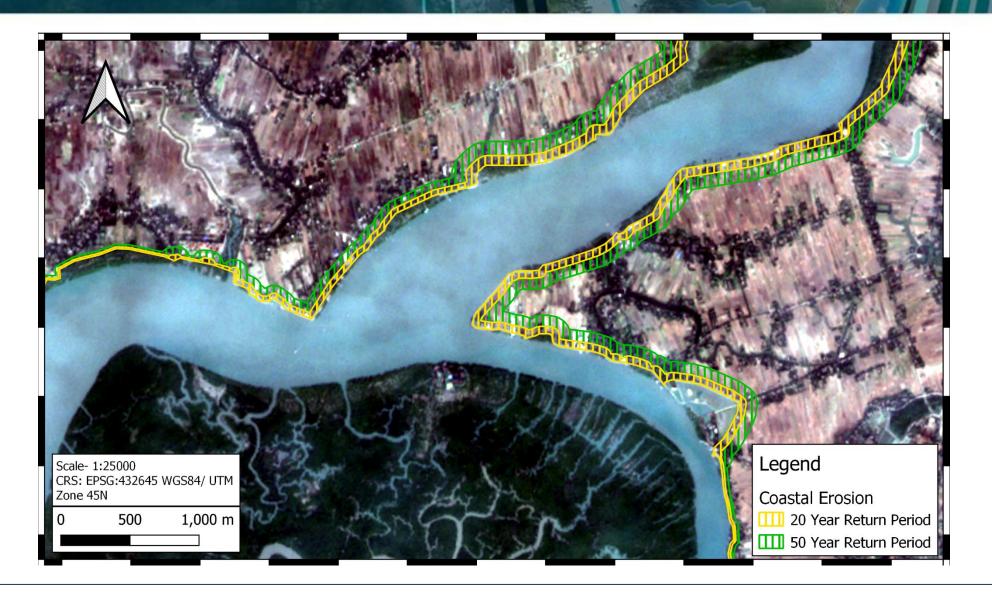
### **Elements at Risk & Vulnerability Assessment**



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### **Expected Damage**





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## EO Opportunities, Challenges & Recommendations

#### **Opportunities**

Significantly improves accuracy, while providing a practical, area-specific, customisable approach.



- Incorporates climate change factors into risk assessment and damage valuation.
- Allows accurate accounting of coastal assets.
- Facilitates use of the recommended valuation methodologies.
- Simple empirical modelling approach vs. complex numeric modelling approach
- Fully considers and incorporates damages from coastal erosion.

#### Challenges

 Data may not be available due to insufficient analysable hazard events.



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 Difficulty in establishing cause and effect within complex coastal processes. Did mangrove deforestation cause coastal erosion or did coastal erosion cause mangrove deforestation?

#### **Recommendations**

 SatEO Ecosystem Valuation methods be piloted for Nature-based Finance and Nature-based Insurance applications.



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