Climate Change – Livelihood – Migration Nexus: A Case Study from Sundarbans, India

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1. Background

- Indian Sundarbans (Fig 1) is a World Heritage site and Biosphere Reserve since 1999
- The region is also a home of large and very poor human population (4.5 million), who earn below US$10 per month (WWF, 2011)
- The region is a ecologically critical area and climate change vulnerability hotspot threatened by sea level rise and frequent extreme weather events (Pramanik et al. 2020)

Figure 2 shows the conceptual framework of the study

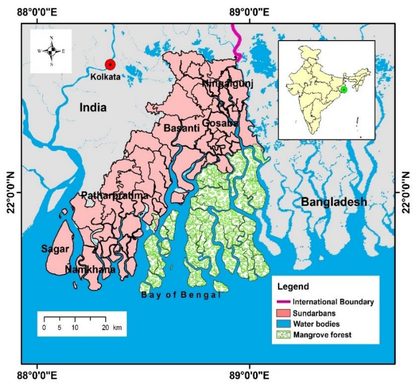

Figure 1

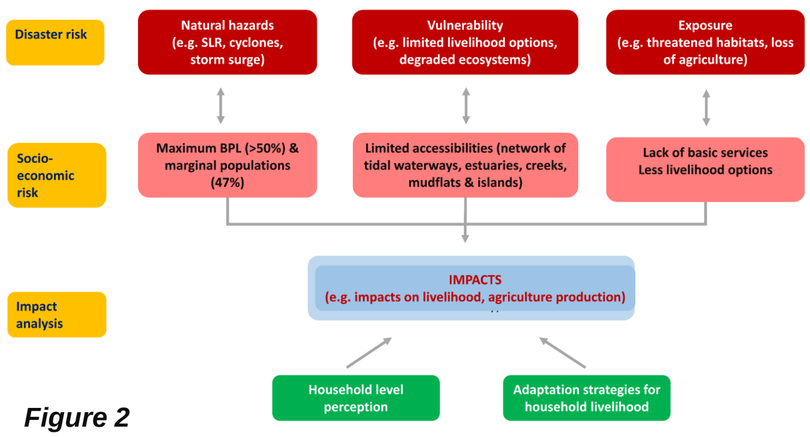

Figure 2

2. Study Aims

Examine the present and future spatiotemporal trends of climatic variables in Indian Sundarban?

Evaluate the impacts of climate change on delta dwellers and their livelihoods.

Examine the potential strategies adopted by the Sundarbans people to support livelihoods and food security in the face of continuing recurrent climate change induced impacts.

3. Data and methods

- The multivariate principle component analysis (PCA) and trend analysis were used to evaluate the seasonal variation of the mostly influencing present and future climatic components.
- 150 structured questionnaire based survey data collected from Sundarbans using purposive random sampling and econometric analysis to evaluate the impacts on livelihood and household adaptation strategies in the face of continuing recurrent climate change induced impacts.

4. Results

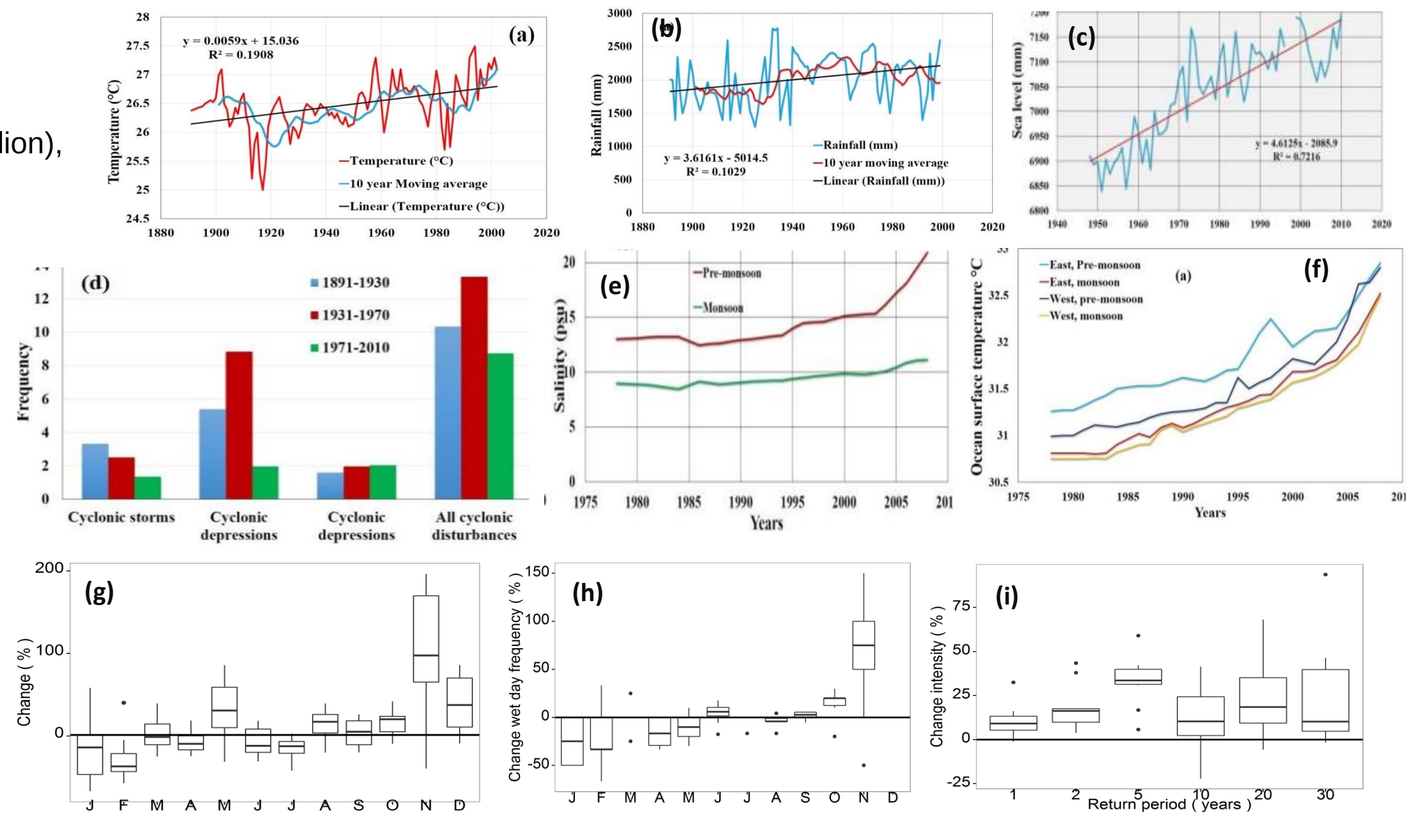

Figure 3 *shows the trends of temperature (a), precipitation (b), sea level rise (c), cyclonic storm, depression, disturbances (d), coastal salinity (e), sea surface temperature (f), and future scenarios (BCC-CSM 1.1, 2050s, 4.5 scenarios) of monthly precipitation change (g), wet day's frequency (h), daily extreme changes (i)*

5. Key findings

Significant trends in climatic impacts and the climate change future scenarios was observed in Sundarbans

Findings from the econometric analysis shows that the limited production in agriculture, aquaculture, decreasing trends in prawn-seed collection, honey and other forest products is the major livelihood threat in Sundarbans

The results also shows that less than 50 USD family income, higher dependency rate (>5), lower per capita land ownership households are more prone to seasonal inter-state migration in Sundarbans

More than 70% of respondents stated that livelihood risks mainly from climate change impacts as the major reason for inter-state migration

6. Conclusion

It helps to establish potential mitigation strategies to combat the impacts of climate change on livelihoods of the coastal communities in the Sundarbans

References

WWF (2011). India Sundarbans Delta: A vision, India.
Pramanik, M.K. (2020). Population health risks in multi-hazard environments: Action needed in the Cyclone Amphan and COVID-19 – hit Sundarbans region, India. Climate & Development.

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