



CARIIA
Collaborative Adaptive Research
Initiative in Africa and Asia




**UNIVERSITY OF
Southampton**


Highlights from the DELTAs, vulnerability and Climate Change: Migration and Adaptation (DECCMA) project



Jadavpur University
India




**Bangladesh University
of Engineering &
Technology**




University of Ghana

DECCMA




Katharine Vincent, Delta Alliance meeting,
Cape Town, 18th June 2018

Study Site Definition




Volta Delta, Ghana
Economy: Agriculture, salt mining
Area: 4,562 Km²
Pop: 850,000

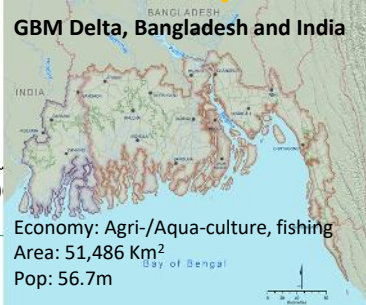
Mahanadi Delta, India
Economy: Agriculture
Area: 13,054 Km²
Pop: 8.1m




Threatened DELTAS (Ericson et al, 2010)



GBM Delta, Bangladesh and India
Economy: Agri-/Aqua-culture, fishing
Area: 51,486 Km²
Pop: 56.7m



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Our team

Partners and institutions shown include:

- UNIVERSITY OF Southampton
- Met Office
- UNIVERSITY OF EXETER
- KULIMA
- bc³ BASQUE CENTRE FOR CLIMATE CHANGE
- PML Plymouth Marine Laboratory
- University of Dundee
- UNIVERSITY OF GHANA
- Centre for Environment and Development
- Sansristi (A Centre of Gender Development)
- Chilika
- National Remote Sensing Centre Indian Space Research Organisation
- BUET
- JIS
- CZGIS
- WARPO
- TARA

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Headline Activities

- Key Stakeholder identification
- Hotspot hazard mapping
- Delta level economy defined
- 5430 sex disaggregated household surveys in 'sending areas' (and women in male-headed households)
- 2675 questionnaires with migrants in 'receiving areas'
- Adaptation inventories compiled
- Set up biophysical models and an integrated assessment framework
- Reviews of governance and policy

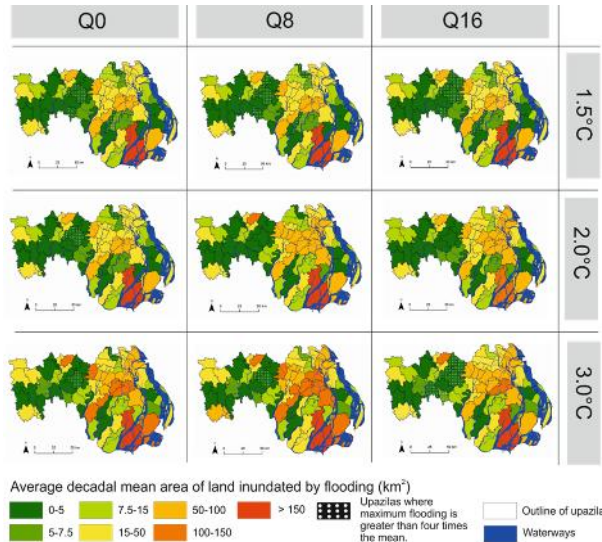
The 'Mauza Multi-Hazard Map' shows different hazard levels (Low, Medium, High) across the Bay of Bengal region. A legend indicates hazard levels: Low (green), Medium (yellow), High (orange), and Very High (red). The map also shows administrative boundaries and a scale bar.

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Impacts of 1.5°C temperature increase

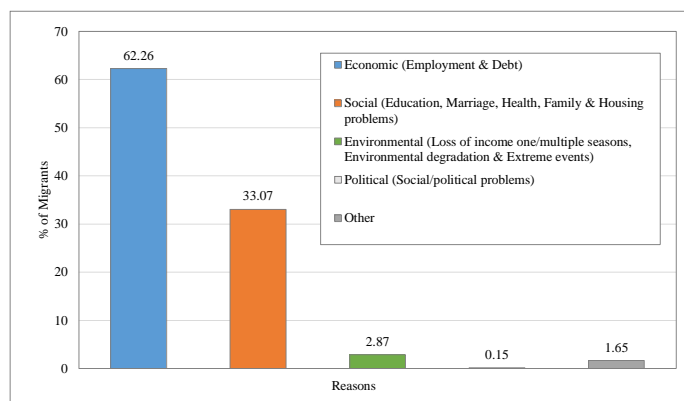
Average decadal mean area inundated due to monsoonal flooding without additional protection under a 1.5°C, 2°C and 3°C increase in temperature



Brown S., Nicholls R.J, Lázár A., Sugata H., Appeaning Addo K., Hornby D.D., Hill C., Haque A., Caesar J. and Tompkins E., 2018. What are the implications of sea-level rise for a 1.5°C, 2°C and 3°C rise in global mean temperatures in vulnerable deltas? *Regional Environmental Change*, DOI: 10.1007/s10113-018-1311-0

Environment is a proximate cause of migration

Main reason for migration across all four deltas as reported by household heads (N=1803)



Adger, W.N., Safra de Campos, S., Mortreux, C., Codjoe, S.N.A., Siddiqui, T., Hazra, S., Adams, H., Das, S. and Abu, M. Perceived exposure to environmental risks and insecurity are significant in migration decisions. *Population and Environment* (under review)

Displacement

Displacement in Sagar, IBD, India





Section of Beguakali unaffected by saltwater flooding



Section of Beguakali affected by saltwater flooding

Government action and inaction



Beguakali, busy embankment construction at site selected for port development

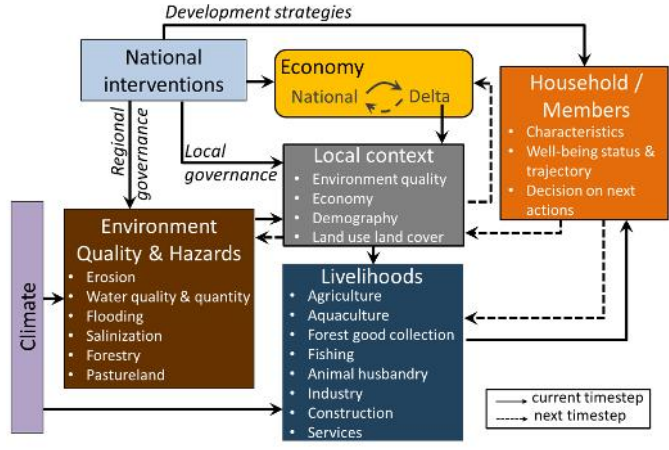


Once fertile Dhablat, unprotected by new embankment



Mortreux, C., Safra de Campos, R., Adger, W.N., Ghosh, T., Das, S., Adams, H. and Hazra, S. 2018. Political economy of planned relocation: A model of action and inaction in government responses. *Global Environmental Change* 50, 123-132.


Structure of the DECCMA Integrated Assessment Model



The diagram illustrates the structure of the DECCMA Integrated Assessment Model. It shows a multi-scale and participatory scenario approach. Key components include:

- Development strategies** (top level)
- National interventions** (blue box) leading to **Economy National** (yellow box) and **Local context** (grey box).
- Local context** includes: Environment quality, Economy, Demography, and Land use land cover.
- Environment Quality & Hazards** (brown box) includes: Erosion, Water quality & quantity, Flooding, Salinization, Forestry, and Pastureland.
- Livelihoods** (dark blue box) includes: Agriculture, Aquaculture, Forest good collection, Fishing, Animal husbandry, Industry, and Services.
- Household / Members** (orange box) includes: Characteristics, Well-being status & trajectory, and Decision on next actions.
- Climate** (purple vertical bar) influences the Environment and Livelihoods.
- Regional governance** and **Local governance** connect National interventions to Local context.
- Economy National** and **Local context** both influence **Livelihoods**.
- Livelihoods** and **Household / Members** influence each other.
- Household / Members** influence **Local context**.
- Local context** influences **Environment Quality & Hazards**.
- Environment Quality & Hazards** influences **Livelihoods**.

Legend: Solid arrow = current timestep; Dashed arrow = next timestep.



Kebede, A.S., Nicholls, R.J., Allan, A., Arto, I., Cazcarro, I., Hill, C.T., Hutton, C.W., Kay, S., Lázár, A.N., Macadam, I., Fernandes, J.A., Palmer, M., Suckall, N., Tompkins, E.L., Vincent, K. and Whitehead, P.W., 2018. Applying the global RCP-SSP-SPA scenario framework at sub-national scale: A multi-scale and participatory scenario approach. *Science of the Total Environment* 635, 659-672.

Stakeholder Engagement

- Dynamic Stakeholder Mapping
- Identification of key-users
- Multi-Scale Engagement
 - National (or State)
 - District
 - Community
 - Expert
- Governance analysis, barriers to implementation of adaptation policy, criteria for successful adaptation





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Volta-Raising the profile of delta residents with parliamentarians

CANADIAN Geographic

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Drones on the delta in Ghana

In Ghana's Volta River delta, the remotely-operated aerial vehicles are going where researchers can't help study coastal erosion, flooding and migration



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GBM-inputs to Delta Plan 2100



Photo:
Saiful Alam

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Mahanadi-requested to provide inputs to policy and highlighting delta migration



Photo:
Andrew Allan

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Indian Bengal delta-partnership with State Department of Environment



Workshop jointly hosted by the State Department of Environment and DECCMA, November 2014



Outputs and Materials

Posters

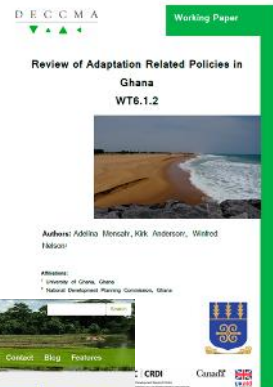


Multimedia Footage



Volta coastal flooding drone foot

Website & blog



Working Papers



www.deccma.com Twitter @DECCMA



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**Thank
you!**

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Twitter: @DECCMA

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