



## BanD-AID

**Economic and social drivers of land use change in coastal Bangladesh – Work in progress update.**

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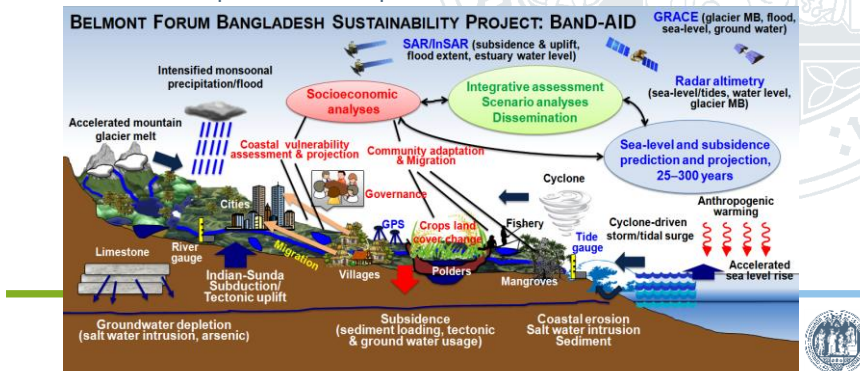
**Introduction** + Research Questions + Theory + Field Work

**Research context:** Belmont Forum project “BanD-AID”

Collaborative Research – **B**angladesh **D**elta: **A**ssessment of the Causes of **S**ea-level Rise Hazards and **I**ntegrated **D**evelopment of Predictive Modeling Towards Mitigation and Adaptation

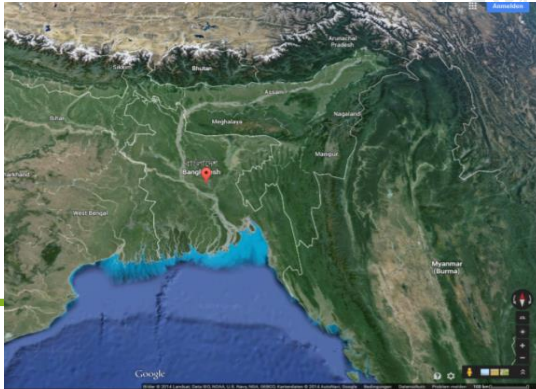
**Cross-disciplinary consortium:**

- 13 Partner PIs and Senior Personnel from 5 countries including Bangladesh
- Balanced expertise with respect to natural and social sciences



Introduction + Research Questions + Theory + Field Work

- Bangladesh delta faces recurrent flooding, potentially aggravated by sea level rise and potentially more frequent and intensified cyclones resulting from climate change.
- Growing demographic pressure and economic development has led to a rapid degradation of the natural ecological system and an increase in the vulnerability of the coastal zones.



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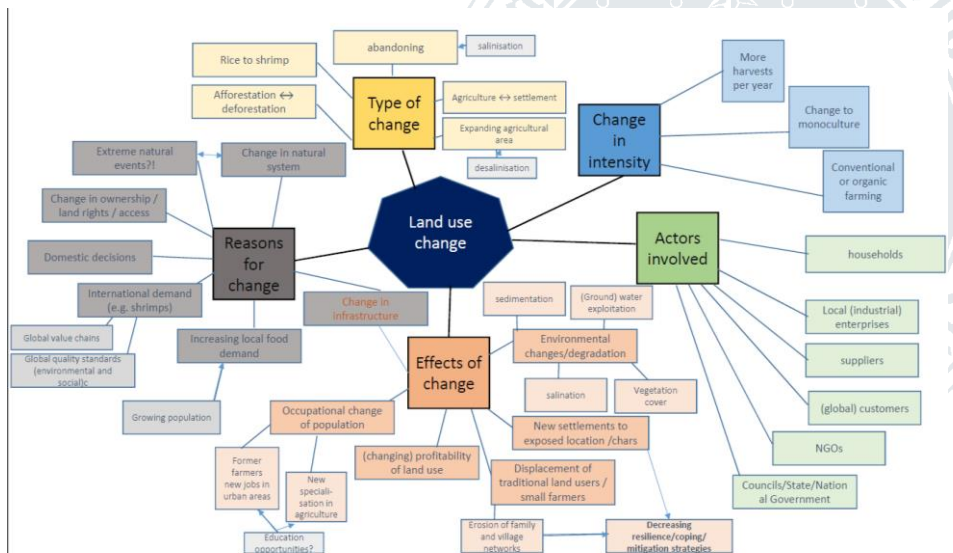
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**Sub-project Cologne: Economic and social drivers of land use change in coastal Bangladesh**

The social and economic processes leading to land use change, deforestation, land degradation and salinization are still not fully understood.



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### Land Change Science:

The general aim is “to understand the biophysical and human causes of land use and land cover change, and the land use and land cover pattern and dynamics affecting the structure and function of the earth system” (Rindfuss et al 2004)

Our contribution from a **economic geography perspective** using following **theoretical / conceptual frameworks**:

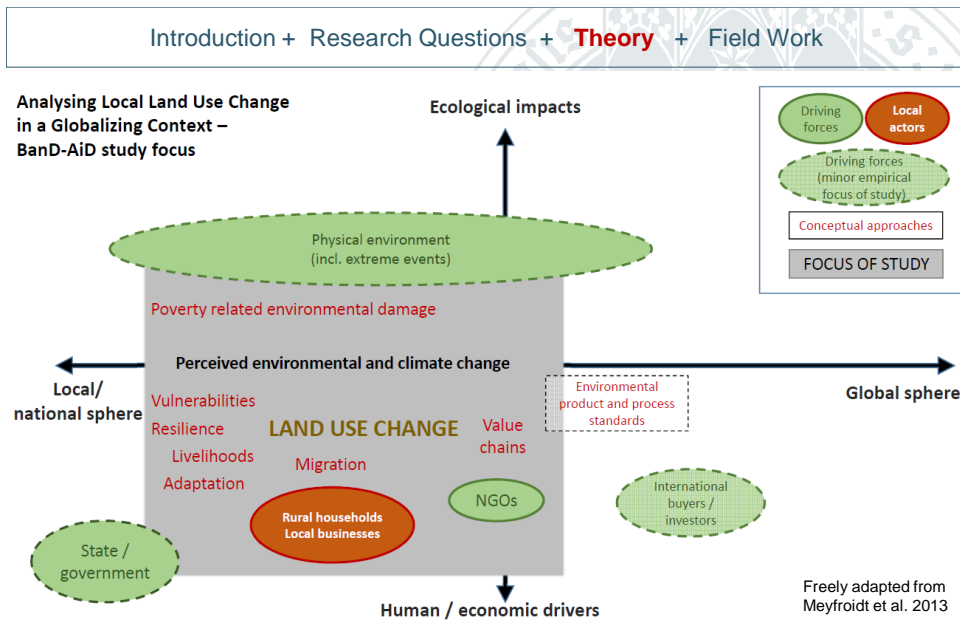
- Global Value Chain approaches
- institutional arrangements
- economic decision making
- social network and migration theory
- vulnerabilities and resilience
- livelihood approaches

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Introduction + Research Questions + **Theory** + Field Work

**Land Change Science:**

Research Framework (Hersperger et al 2010):

- Land change science is still evolving, but there are some crucial blocks/factors:
  - driving forces** (political, economic, cultural, technological, natural)
  - Actors** (a) affect driving forces; b) change land directly)
  - land change**
- Prevalent research question is:
  - how various driving forces and actors together affect land change and how the link between the three elements can be conceptualized

Two approaches

- process-oriented approach based on household surveys
- pattern-based approach based on remote sensing and census data

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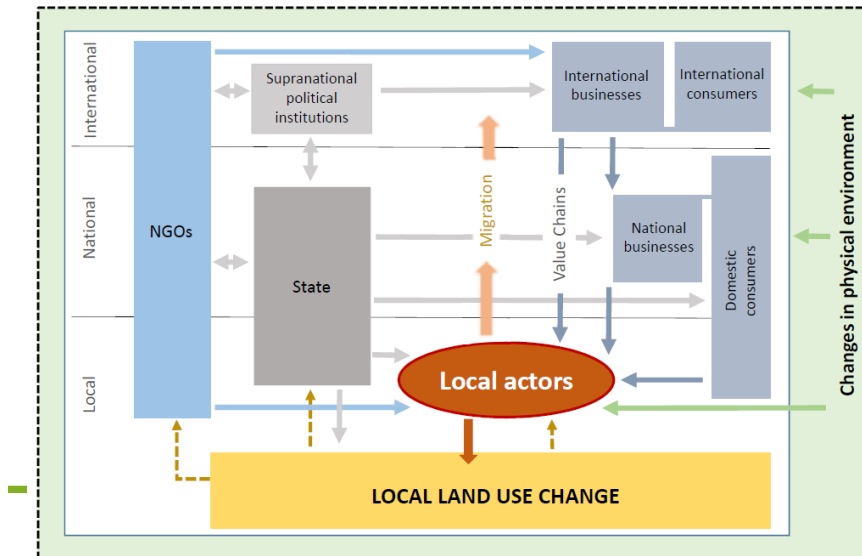


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Introduction + Research Questions + **Theory** + Field Work

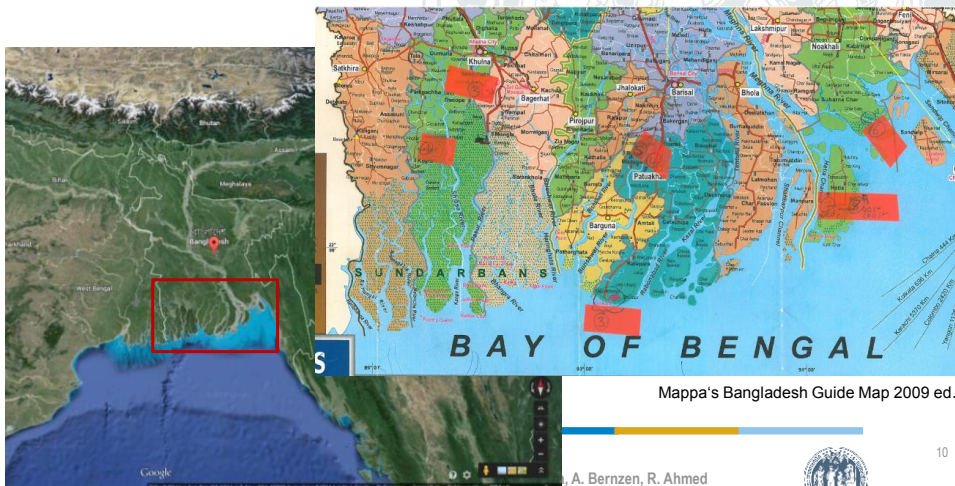
### Proposed model to link land change, actors and driving forces (own design)



Introduction + Research Questions + Theory + **Field Work**

#### SO FAR:

- Explorative field trip to Bangladesh: 3.5 weeks in March and April, selection of study sites and first pre-test of questionnaire





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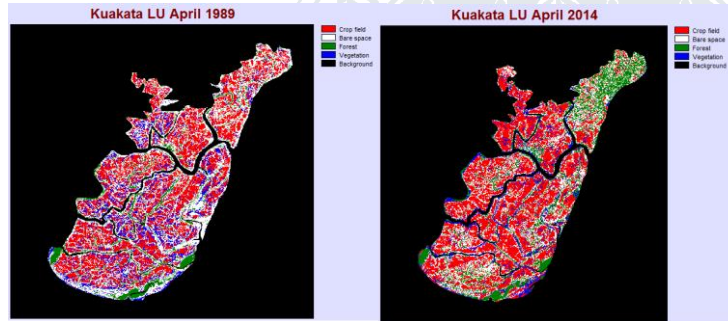
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**Preliminary findings from explorative field work:**

- Wide-spread changes in land use patterns.
- Increasing intensity of land utilization ← immediate economic demand.
- Overall, no. of harvests p.a. has increased → overexploitation of water.
- BUT: In many coastal villages: decrease ← ongoing soil salinization.
- Coping strategies: new rice varieties (HYV), improved technical skills, machines, and additional irrigation.
- Development organizations support farmers (cyclones Sidr and Aila).
- Natural forests and rice paddies to shrimp ponds ← domestic decision-making, global supply chains, external markets (shrimp farming) → displacement of many traditional land users and small farmers.



## Kuakata, land use 1989 and 2014



Land use type	Cover in sq km in April 1989	% 1989	Coverage in sq km in April 2014	% 2014	Difference 2014-1989 total area	Difference in % points 1989-2014 (area)
Crop field	158,84	37,53%	188,77	44,11%	29,93	6,58%
Bare space	166,76	39,41%	40,94	9,57%	-125,82	-29,84%
Forest	38,53	9,10%	76,62	17,90%	38,09	8,80%
Vegetation	59,05	13,95%	121,62	28,42%	62,57	14,47%

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### NEXT STEPS:

#### Secondary data analysis:

Detecting land-use change over time using **satellite image data**.  
Measuring economic activity/land use through **statistics on land use** and registered businesses in a certain area (subject to availability of data)

#### Field work and primary data collection:

##### Phase 1: Oct-Dec 2014, 6-8 weeks

- A randomized 1000-respondent questionnaire survey of residents of selected coastal villages in rural and semi-urban environments

##### Phase 2: 2015

- Qualitative research complementing survey findings on households
- Focused semi-structured interviews (about 40 to 50 in number) with businesses active in three major coastal industries (shrimp farming and processing, logging and large scale farmers)





Thank you



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