



# Does Systems Thinking Improve Our Understanding on Resilient Livelihoods? Insights from Coastal Bangladesh

Session: Resilient Livelihood  
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## Sea Level Rise



# Water Logging and Salinity Intrusion



## Coastal Erosion

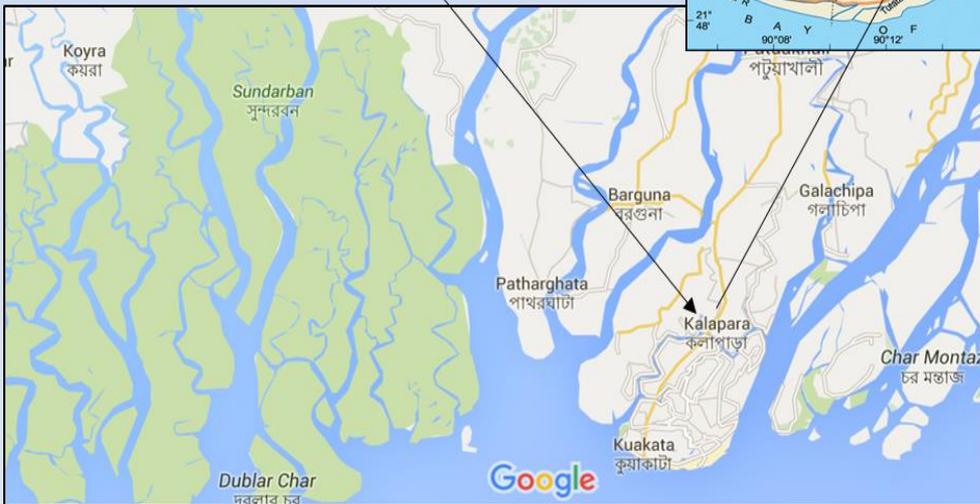
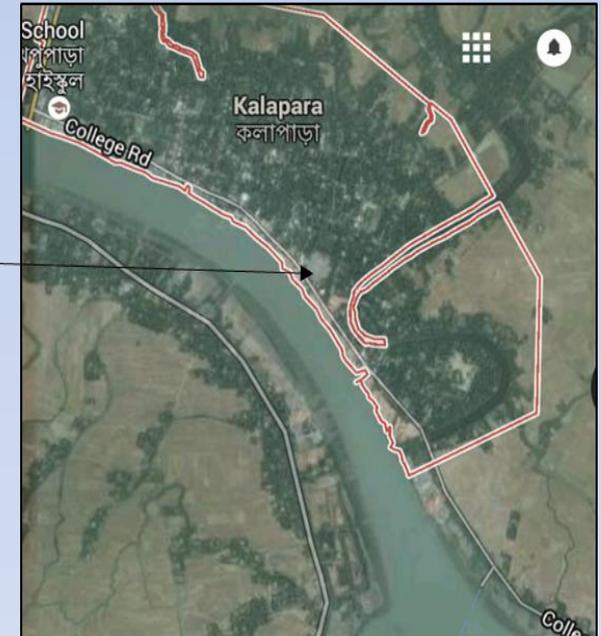
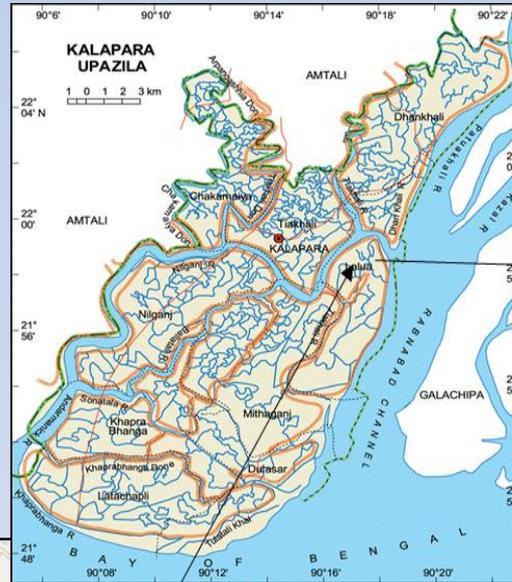


# GOBESHONA 4

8 - 11 January 2018

Building local climate knowledge

## Brief Background: The Area “Kalapara (Patuakhali)”



- **Population:** ca. 1.5 million (Census 2011)
- **Area:** ca. 490 sq miles
- **Diversity:** Hindu, Muslim, Ethnic, & Female-headed H/Hs
- **Livelihoods:** Farming, Fishing, Livestock, forest dependency
- **Exposure to climate stresses:** Slow-onset climate events (e.g. sea level rise, rainfall variability) & extreme climate events (e.g. tropical cyclones)
- **Climate impacts:** Salinity in croplands, decrease in agriculture production, water scarcity for human consumption, climate migration etc.

## Social Vulnerability to Climate Change

**Vulnerability** to the impacts of climate change is as much defined by socio-economic [...and existing infrastructural...] conditions as by exposure to natural stressors (Adger, 1999; IPCC, 2014).

# Methodological Approach

## 1) Different farmer groups:

- Large Farmers
- Smallholder farmers
  - Muslim
  - Hindu
  - Ethnic minority (Rakhaine)
  - Female-headed

2) HH-level Semi-Structured Questionnaire Survey: 50 /farmer group – 250 total) (Sept., 2017–Dec., 2017)

3) Qualitative methods: in depth case studies (Oct – Dec., 2017)

4) Key Informant Surveys & Social Network Analysis: Next Summer (2018)

## Climate Change $\approx$ Social Injustice

### Variables that contribute to social vulnerability to climate change:

- Gender, religion and ethnicity
- Dependency on farming and fishing
- Land ownership pattern
- Access to non-farm income sources

### Most vulnerable groups:

- **Marginal farmers**, who do not have:
  - their own farming lands (but work as labors or lease others' lands)
  - non-farm sources of income
- **Women and indigenous people**, because of their:
  - exposures and dependency to nature
  - limited resources for improved adaptive capacity



## Major Components:

- Human Capital
- Natural Capital
- Financial Capital
- Social Capital
- Physical Capital



## Resilient Livelihoods

Resilient Livelihoods =  $f$  (Climatic factors \* Non-climatic factors)

## Farmers function in a social space



## Preliminary Findings: Climate Information for Farmers Adaptation Decision-Making

- **Understand farmers' behavioral pattern** (e.g. how does local farmers function within their own social spaces?)
  - They go to local market every evening; watch TVs: exchange info with fellow farmers; interact with local ag extension agents
- **Identifying local "information" needs**
  - Agro-meteorological information (e.g. rainfall variability)
  - Information needs are based on local climatic stresses
- **The information they understand**
  - Information that entails less probabilistic nature
- **The information they trust**
  - Information that matches with local traditional practice (e.g. relying on "Panjika")

## Some demand-side challenges: Climate Information for Farmers Adaptation Decision-Making

- What *if* we provide an information to a farmer who does not own lands? (land ownership)
- What *if* the farmer does not own any communication device? (non-farm resource ownership)
- What *if* a farmer does not speak mainstream “Bangla” language? (diversity in background)
- What *if* a farmer needs more “roads” or “electricity” than climate information? (prioritization of necessities)

We need to understand the *dynamic interactions* among various components of “systems” that will shape the use of climate information (or other resources) for livelihood decisions of a farmer.

“Better coordination [coordinated & concerted efforts] for adaptations”

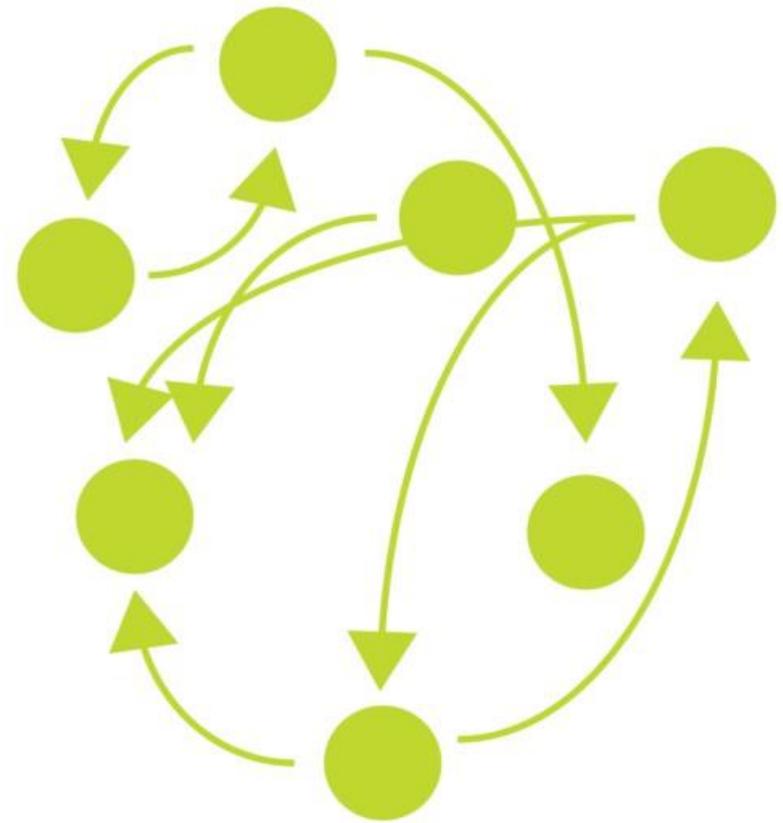
# Systems Thinking

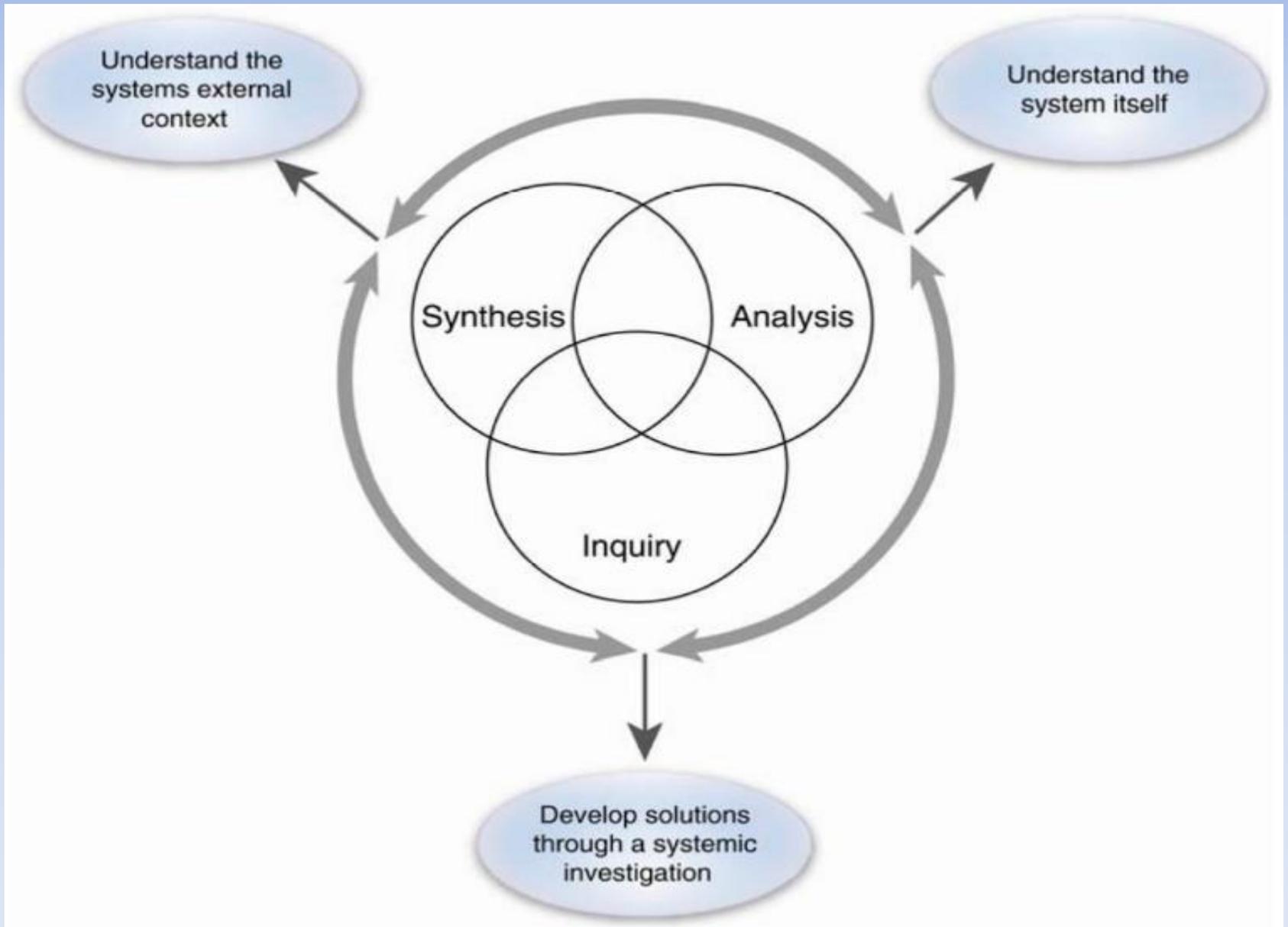
A system thinking is the *interdisciplinary and integrated* study of systems (social, economic, political, environmental, infrastructural, information).

# Traditional thinking



# Systems thinking





Systems level thinking helps us to understand and consider local and regional contexts, including *interactions*, *processes*, *synergies*, and *trade-offs* between various sub-components at multiple levels that are critical for resilient livelihoods.

Otherwise, we might have to face increasing evidences with “maladaptation” and “vulnerability”.

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