

# Social Resilience and Institutions

## Robustness of Social-Ecological Systems

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## Our Puzzles

- How do social-ecological systems adapt to spatial and temporal variability of ecological and social phenomena?
- What are institutional configurations that maintain the functioning of SESs within a particular variability regime?
- Can these adaptations increase vulnerability of the system to a change of the variability regime?

## Our focus

- Formal and informal *rules in use*.
- Rules are human constructs and defined as shared understandings that refer to enforced prescriptions about what actions are *required*, *prohibited*, or *permitted*.
- Robustness instead of Resilience: Robustness relates to capacity to maintain the system performance when subject to external or internal variability. Robustness is generally used for designed systems.

## Triangulation

Formal modeling



Case studies

## Robustness to spatial and temporal variability

- Based on comparative analysis of many case studies we can identify broad categories of resource systems with mobile resources (fisheries, pastoralism) and resource systems with build up infrastructure (irrigation systems) (Schlager et al. 1994; Janssen et al. 2007)

## Dealing with heterogeneity of landscapes

- Many types of institutional arrangements (transhuman, nomadic) who adapted to spatial variability of rainfall, varying from Swiss Alps to Kenya and India
- Current trend on privatization leads to mismatch of social and ecological dynamics.

## Adaptations to spatial and temporal variability

- High investment to coordinate activities of extraction and concentration.
- Many social-ecological systems are adapted to particular variability regimes.
- These systems are robust, yet fragile...
- to a change in variability regimes, such as effects of globalization.

## Robustness Tradeoffs

- To increase robustness to variability X one might become vulnerable to variability Y.
- Examples:
  - Robust to frequent events, vulnerable to infrequent
  - Fuel efficiency of airplanes vs stability airplanes
  - Agistment of livestock in Australia (maintaining livestock vs spreading diseases)



## Robustness/Resilience questions for Africa

- The problem of the “nation state”:
  - representation of diverse ethnic groups
  - Transboundary problems
- To reduce resilience of bad “states”:
  - How to get out of traps
  - (Post-)conflict effects on community resource management