

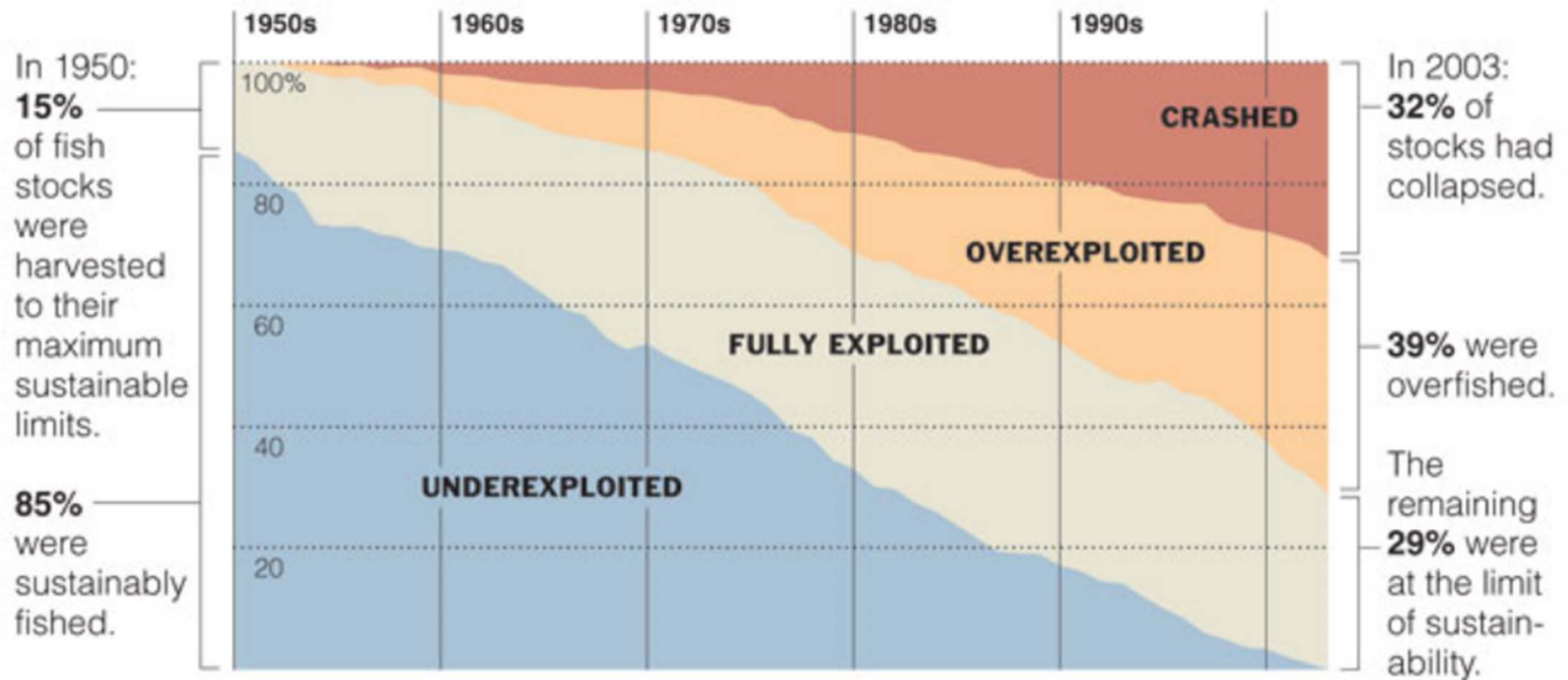


Adaptive Resource Management: Integrating Natural and Social Sciences in SUSFISH WP8

Dr. Jan Sendzimir

Head – Water and Resilience Group
Risk, Policy and Vulnerability Program
International Institute for
Applied Systems Analysis

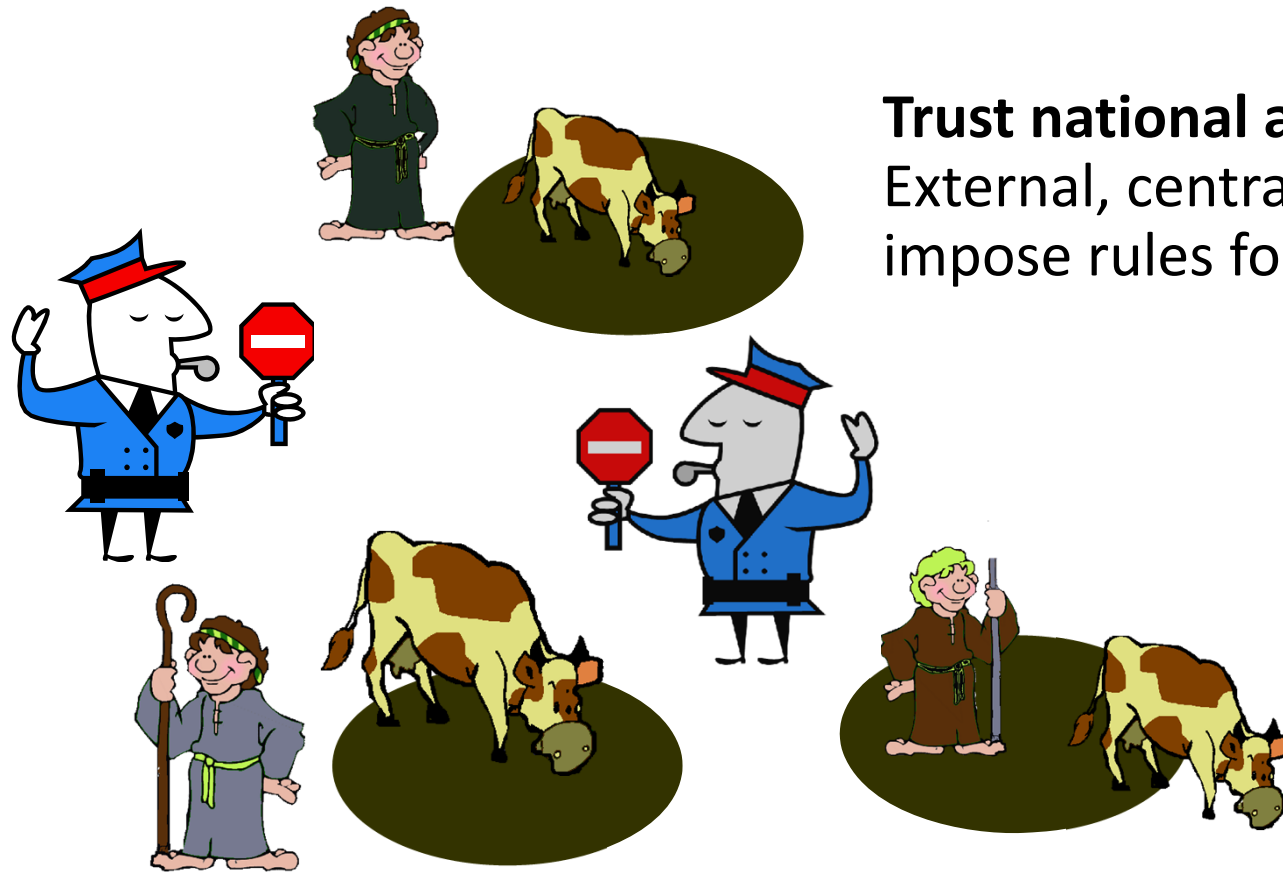
Condition of the World's Fisheries



OUTLINE

- Challenges of Resource Management
- The Promise of Social Science
- Adaptive Systems Science
- Afforestation of the Sahel: an example

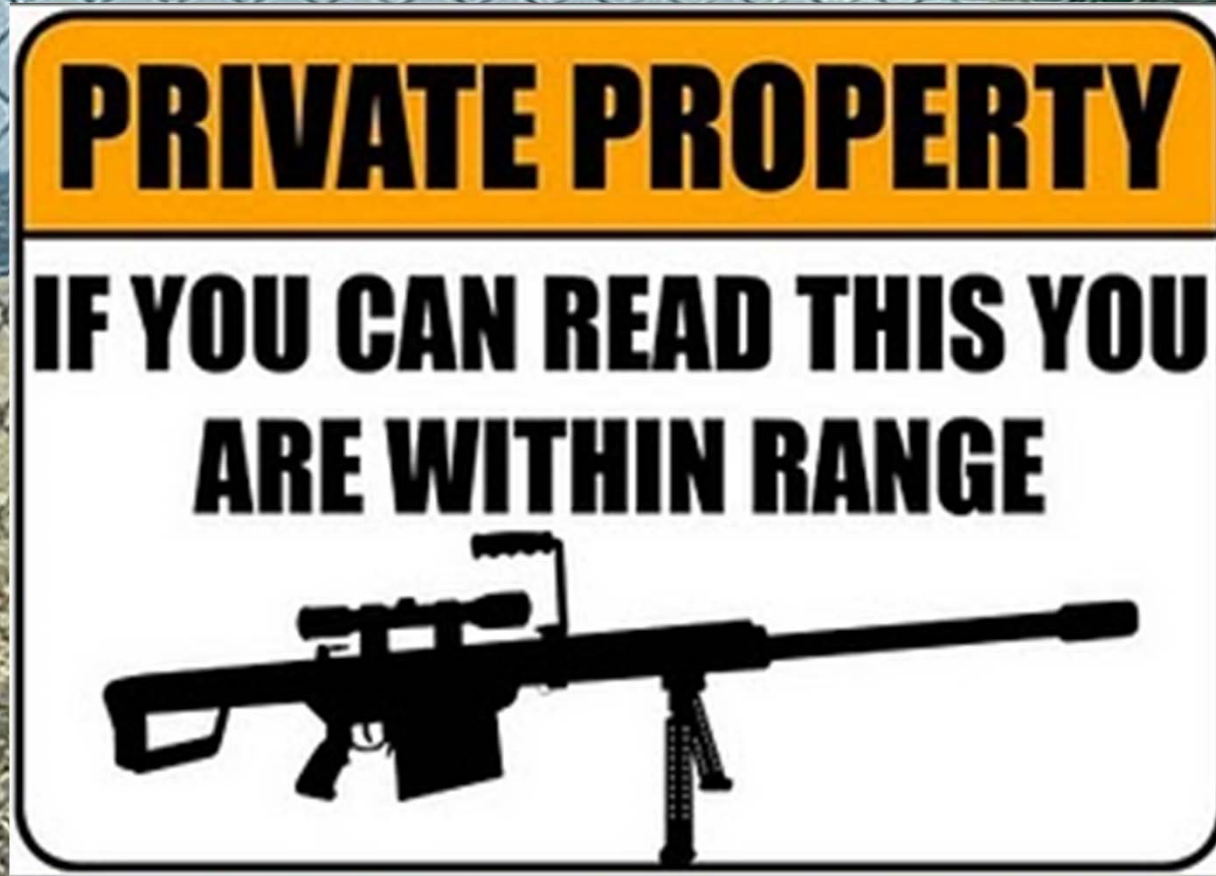
How to avoid tragedy of the commons?



Trust national actors not locals
External, central authorities must impose rules for regional control.

Answer no 1: State Control

How to avoid tragedy of the commons?



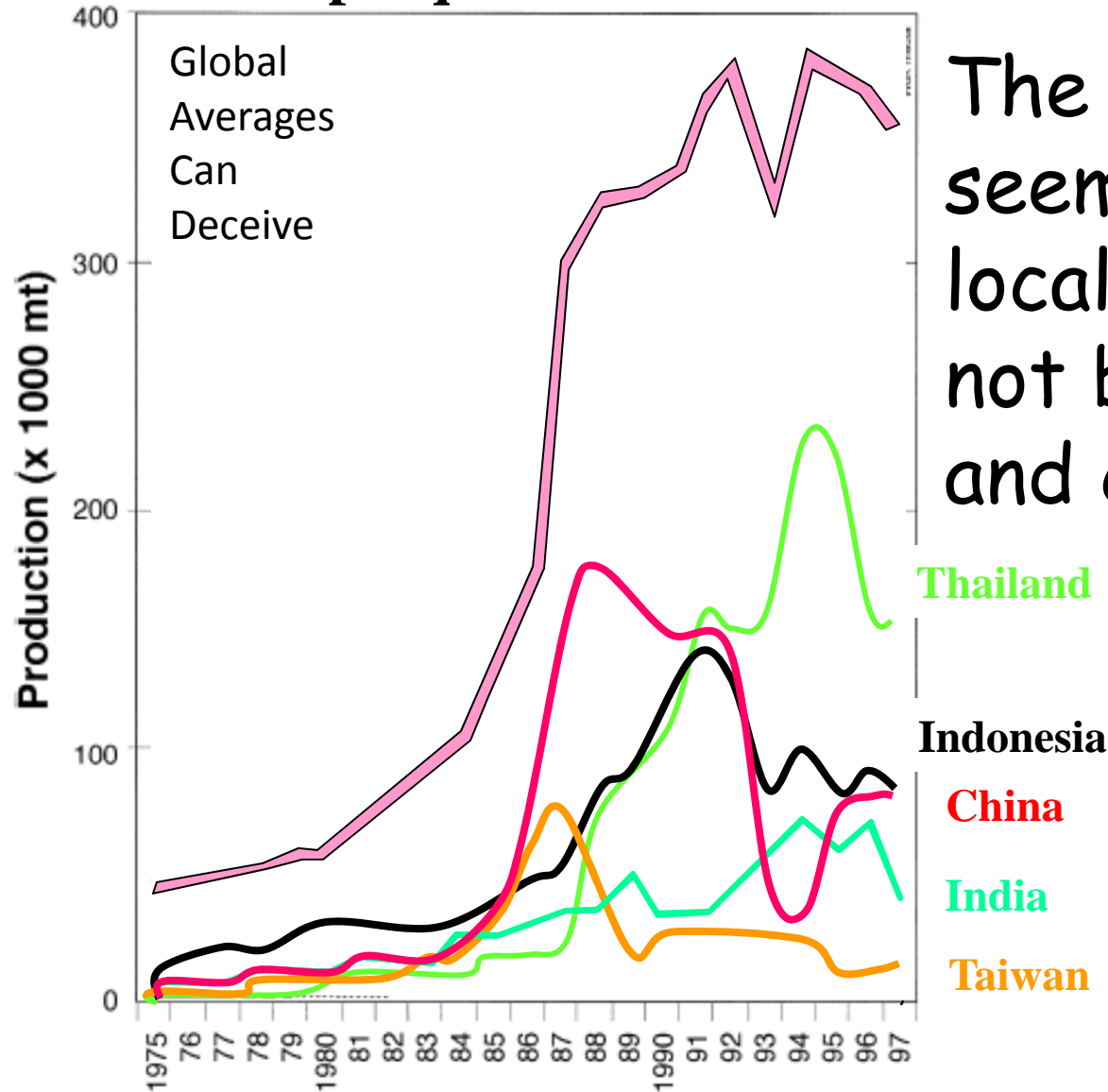
Answer no 2: Privatization 2006 Capelinks.com

State Control and Privatization: High failure rate

Enforcement
of rules
doesn't come
automatically



Global Shrimp Aquaculture Production



The world may seem robust but local regimes may not be resilient and collapse

Sources: Primavera 1997, Rosenberry 1998, Kautsky et al. 2000

OUTLINE

- Challenges of Resource Management
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- Afforestation of the Sahel: an example
- Adaptive Science

Struggle to Govern the Commons

Tragedy is not inevitable

Empirical Research: Elinor Ostrom

Local resource users can self-organize to cooperatively develop their own institutional regulations to manage common pool resources in sustainable ways



Demonstrated in more than **500** case studies around the world e.g.:

Forests (India, Thailand)

Fisheries (Brazil, Philippines, India, USA)

Irrigated Agriculture (India, Nepal).

Many others

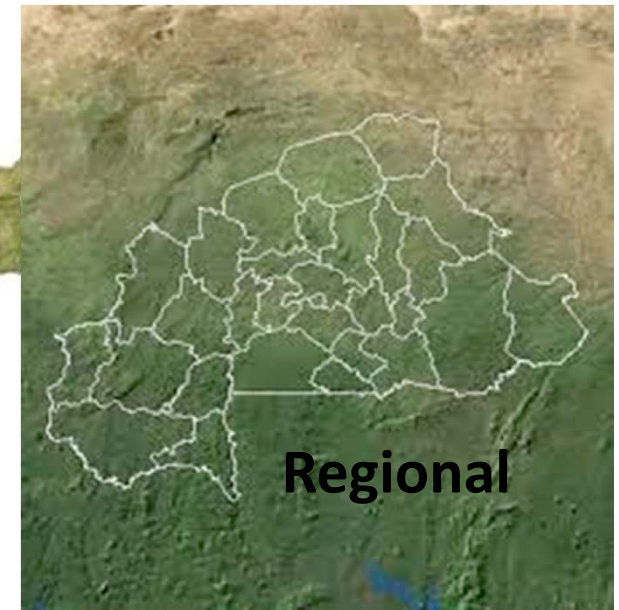
Sustainability requires integrating multiple perspectives **Subsidiarity**



International



National



Regional



Local

Sustainability requires integrating
multiple perspectives

But which perspectives?

Environment

Economy

Social / Political / Cultural

Environmental Degradation in the Sahel results from

Environment

Agricultural Practices

Economy

Demographics

Social / Political / Cultural

Culture

Source: Krebs, J., and M. J. Coe. 1985. Sahel famine: an ecological perspective. *Nature* **317**:13-14.

Inadequate Governance is responsible for

Environment

Famines

Economy

Economic Disasters

Social / Political / Cultural

Political Regime Behavior

Source: von Braun, J., T. Teklu, and P. Webb. 1999. *Famine in Africa: causes, responses, and preventions*. Food Policy Statement No. 28. International Food Policy Research Institute (IFPRI), Washington, D.C., USA. [online] URL: <http://www.ifpri.org/pubs/FPS/fps28.htm>

Revitalizing Rural Africa requires investing in 3 areas

Environment

Nature

Economy

Wealth

Social / Political / Cultural

Power

Source: Anderson et al. (2002) *Nature, wealth and power: emerging best practice for revitalizing rural Africa*. United States Agency for International Development (USAID), Washington, D.C., USA.

OUTLINE

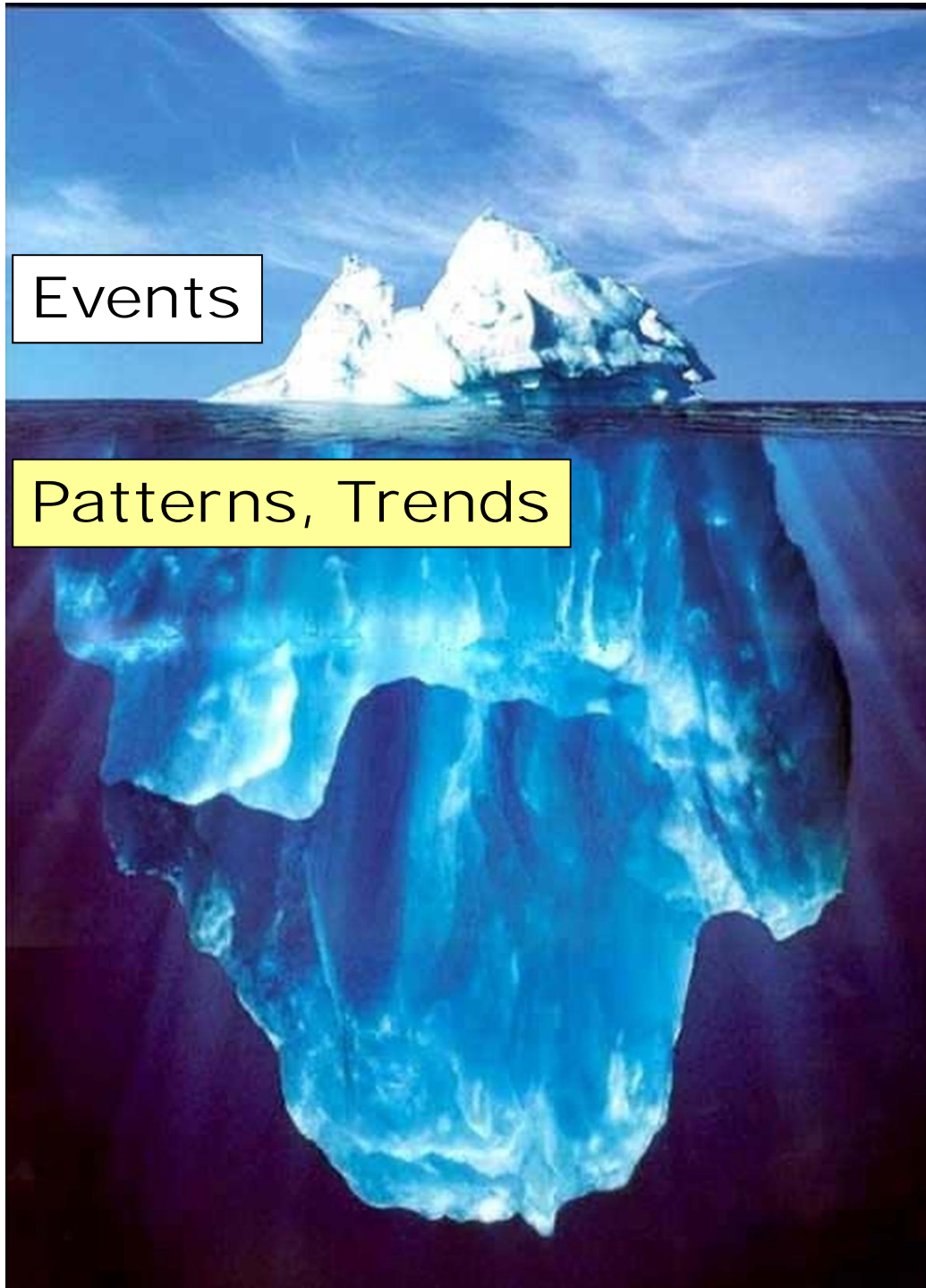
- Challenges of Resource Management
- The Promise of Social Science
- Adaptive Systems Science
- Afforestation of the Sahel: an example



Events

What just happened?

Ways of
explaining reality



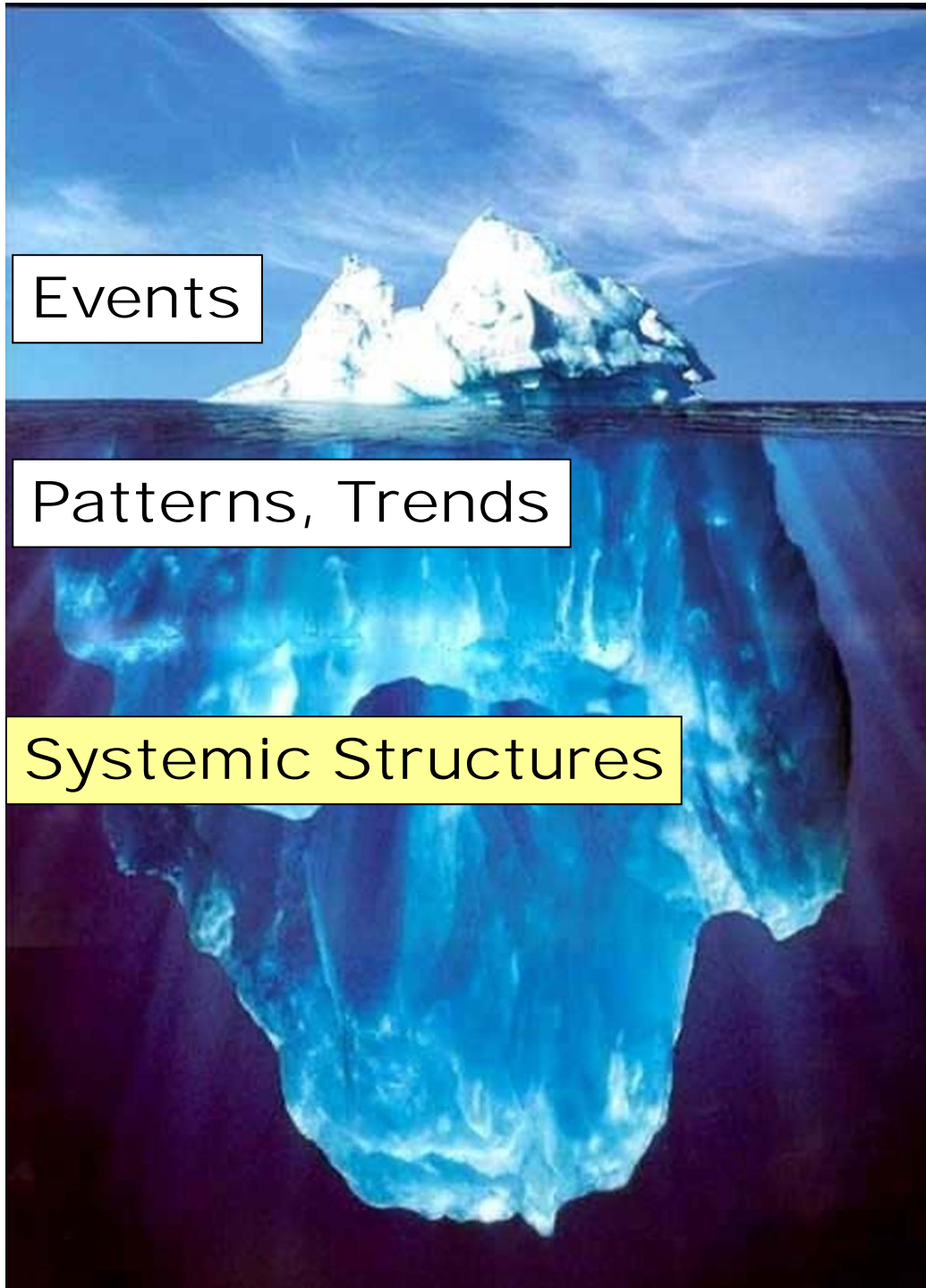
Events

Patterns, Trends

What just happened?

What's been happening?
Have we been here or some
place similar before?

Ways of
explaining reality



Events

Patterns, Trends

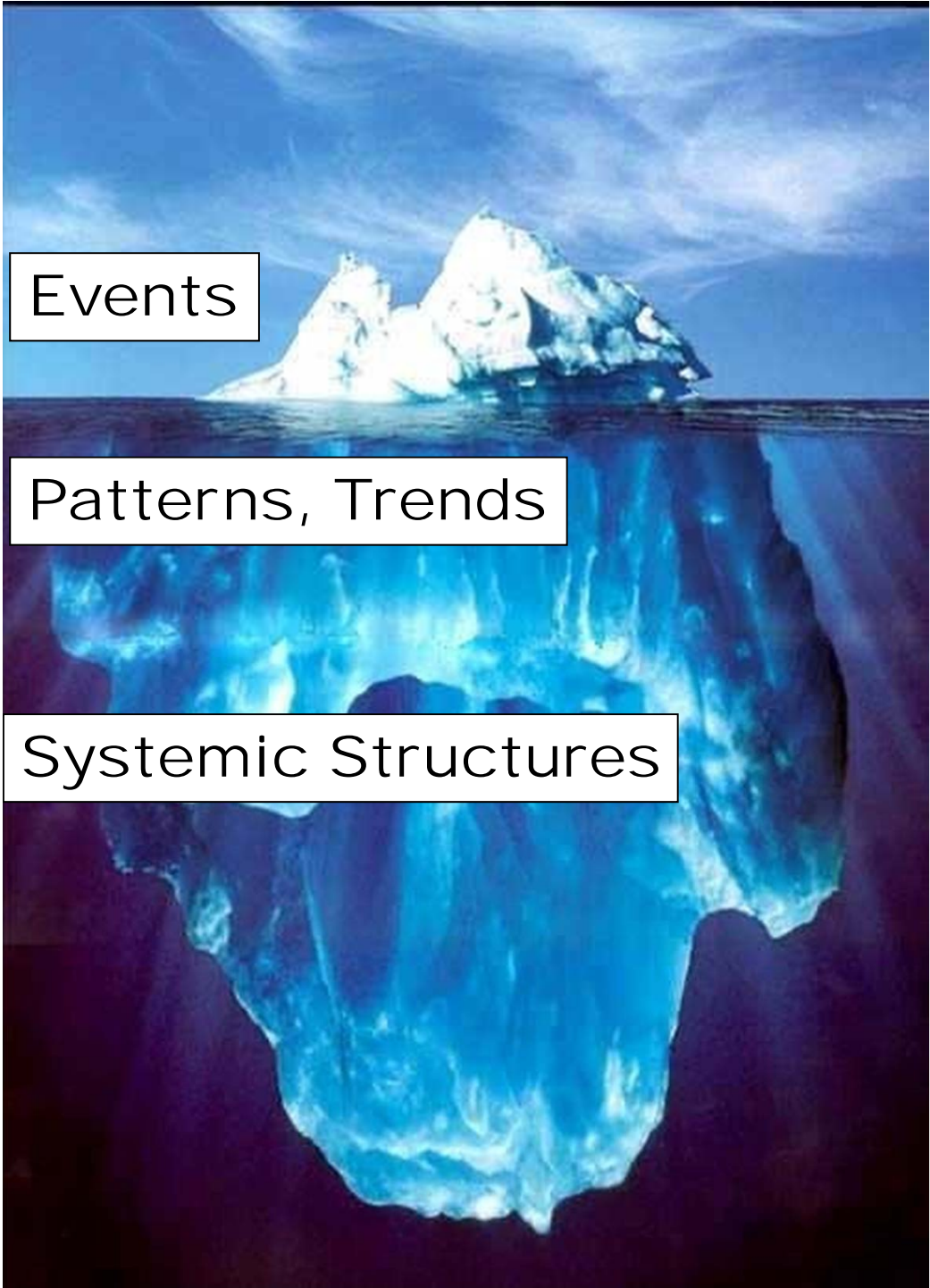
Systemic Structures

What just happened?

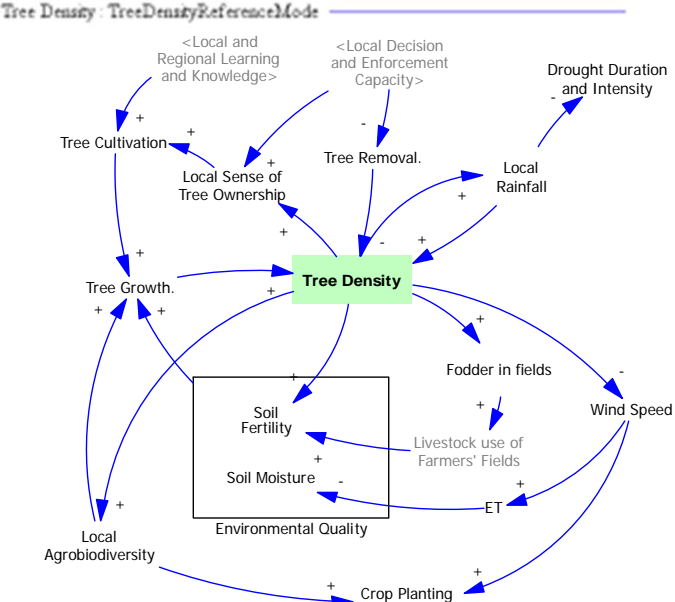
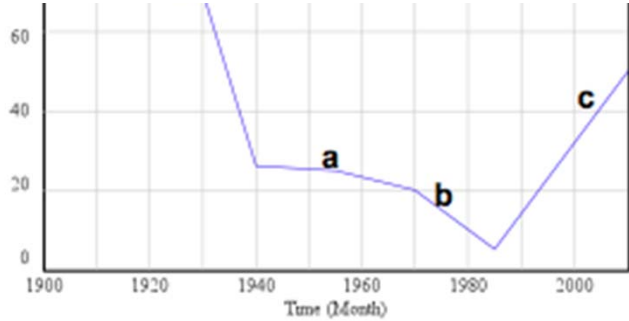
What's been happening?
Have we been here or some
place similar before?

What are the forces at play
contributing to these patterns?

Ways of
explaining reality



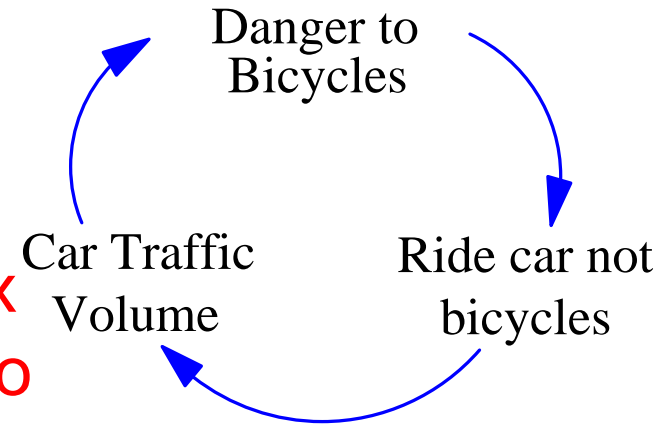
Tree Trends - decline & rise



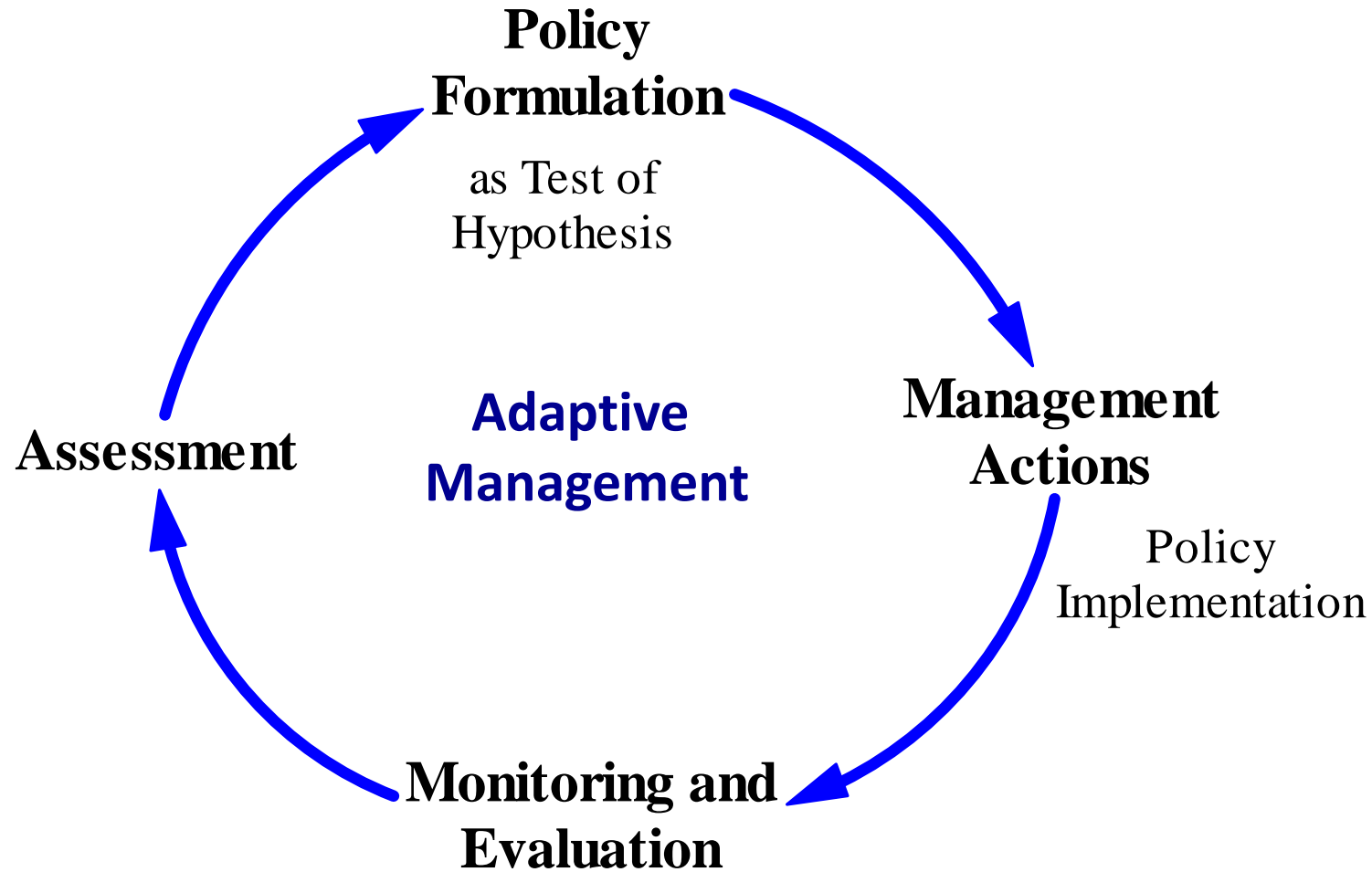
Circular Causation:

Known all over the World

- French
- Spanish
- English
- Dutch
- German
- Polish
- Russian
- Finnish
- Hungarian
- Arabic
- Turkish
- Cercle vicieux
- Circulo vicioso
- Vicious circle
- Vicieuze cirkel
- Teufels kreis
- Błędne koło
- Porochnyi krug
- Noidankehä
- Ördögi kör
- Daira farigha
- Fasit Daire



Research and Management Linked in a Cycle of Integrated Learning



OUTLINE

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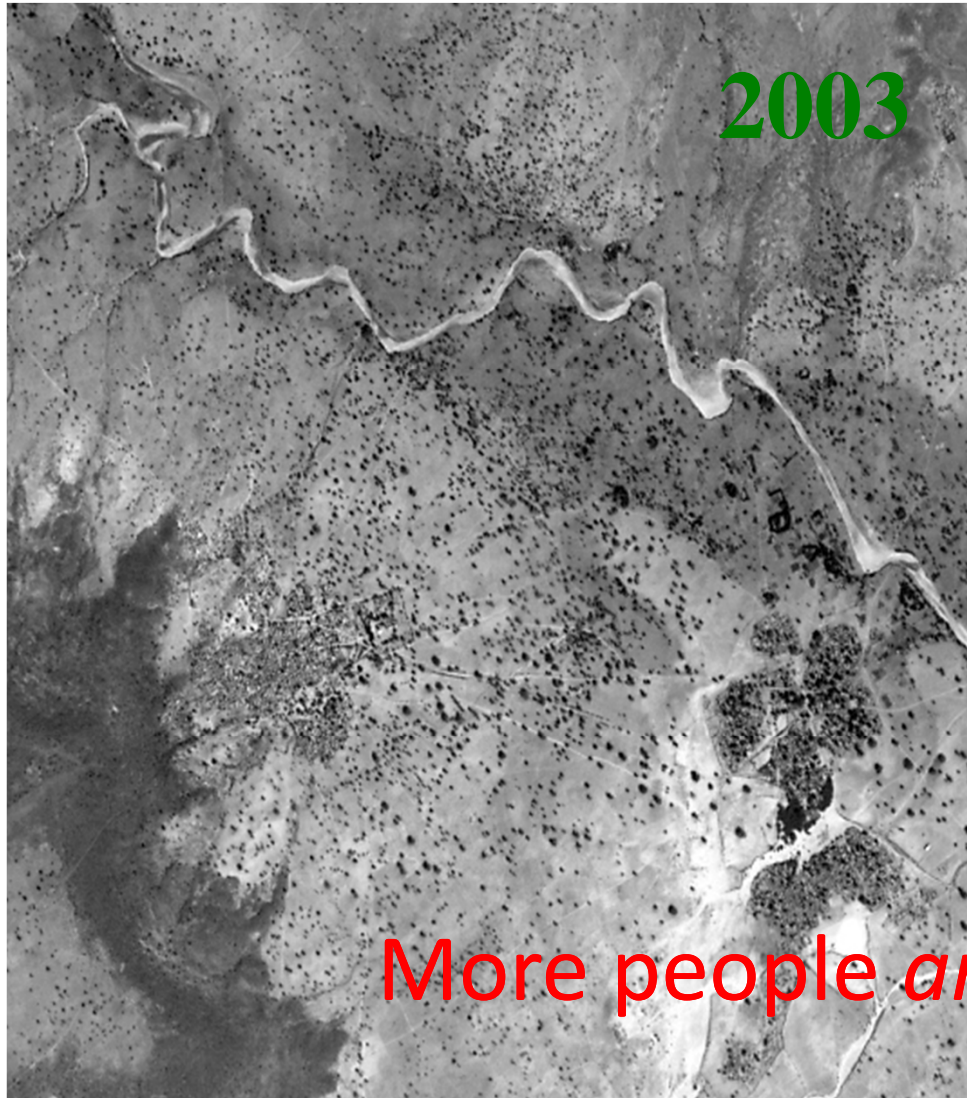
STUDYING SUCCESSFUL REGIME CHANGES

Vegetation in Galma, Niger

Niger Population

12 million

4 million



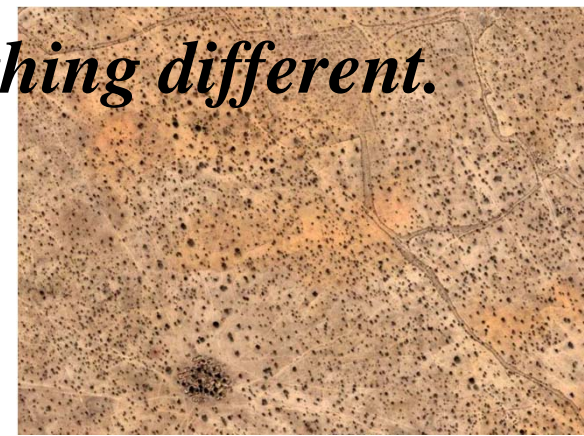
More people *and* more trees

The Niger-Nigeria Border: same ecosystem, different institutions

Niger

Less Rain

The people of Niger are doing something different.



50 km



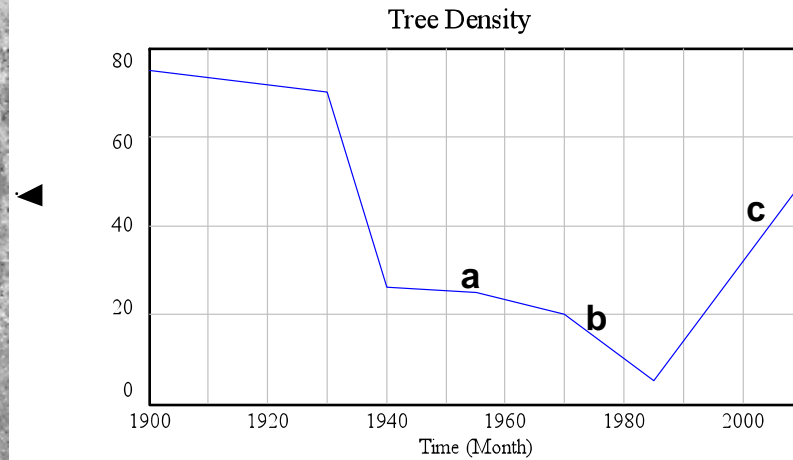
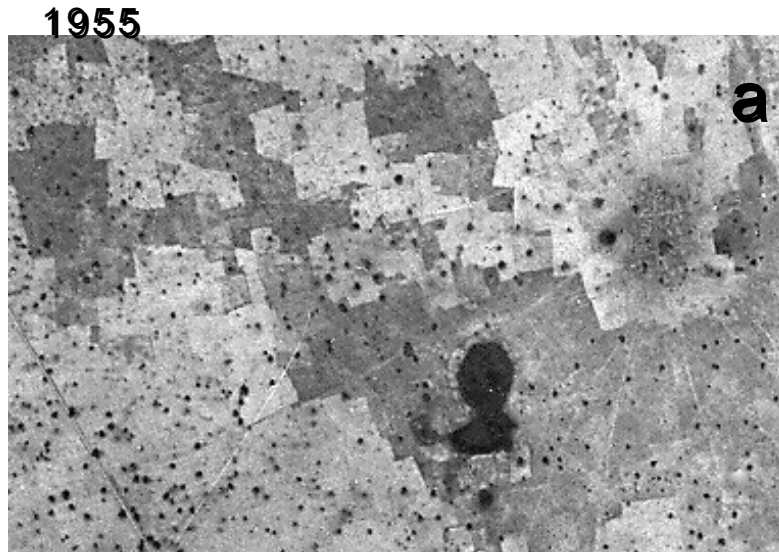
Nigeria

More Rain

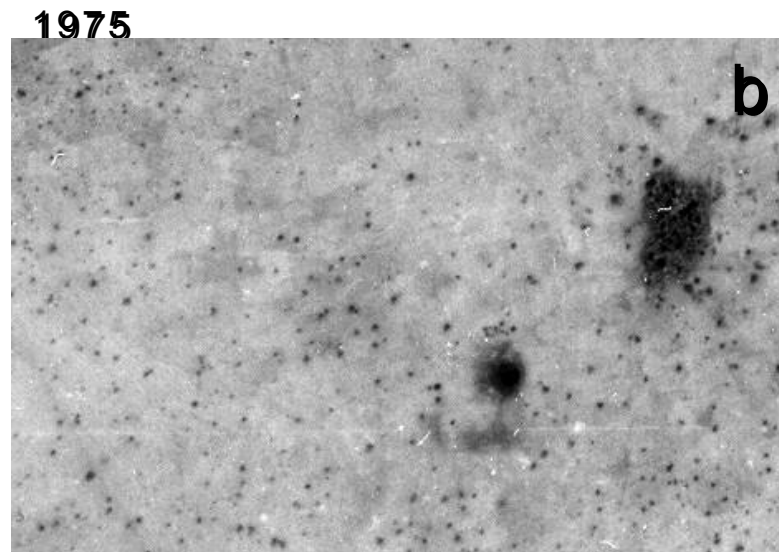


Source: Google Earth, 2005

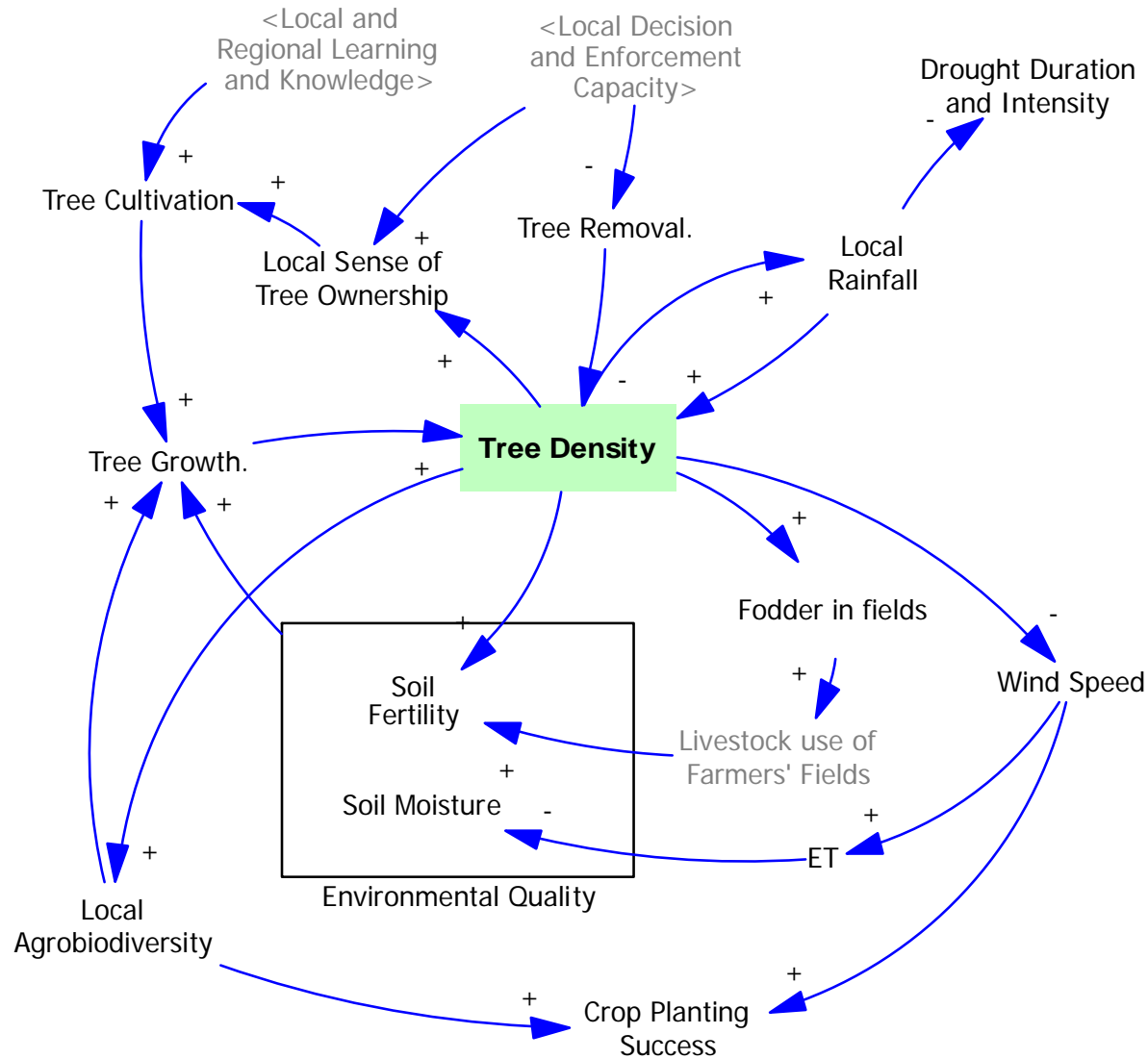
Reference Mode: Tree Cover Decline and then Recovery



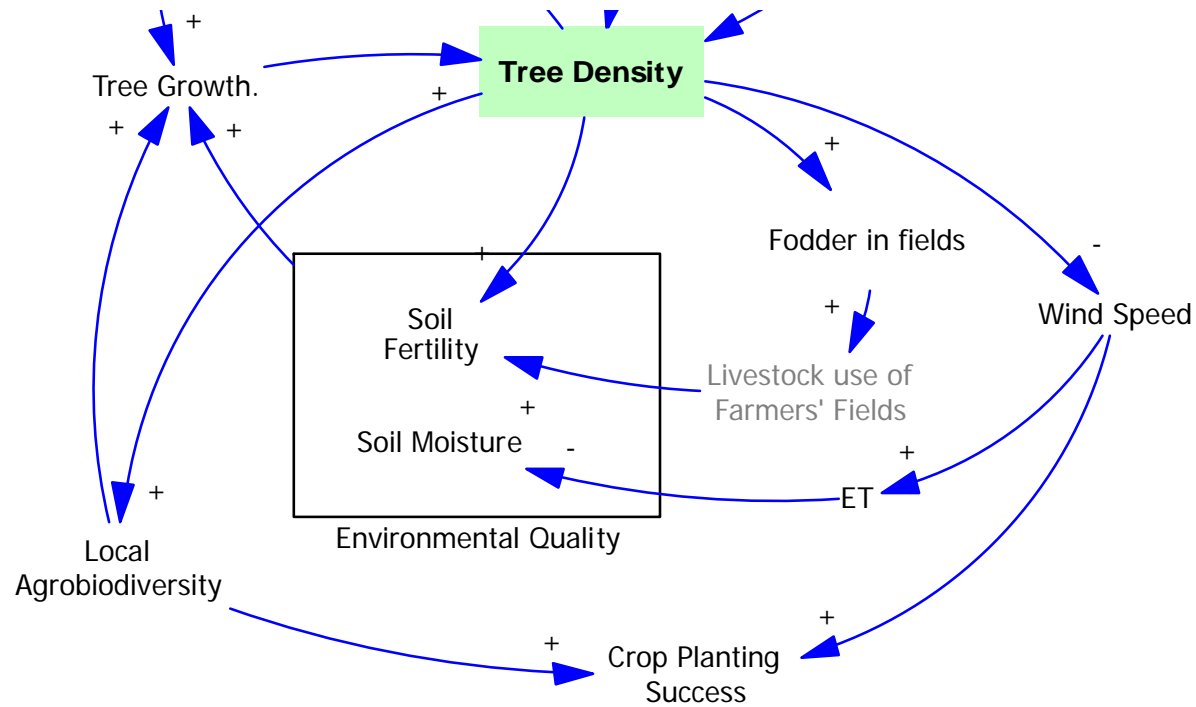
Tree Density : TreeDensityReferenceMode



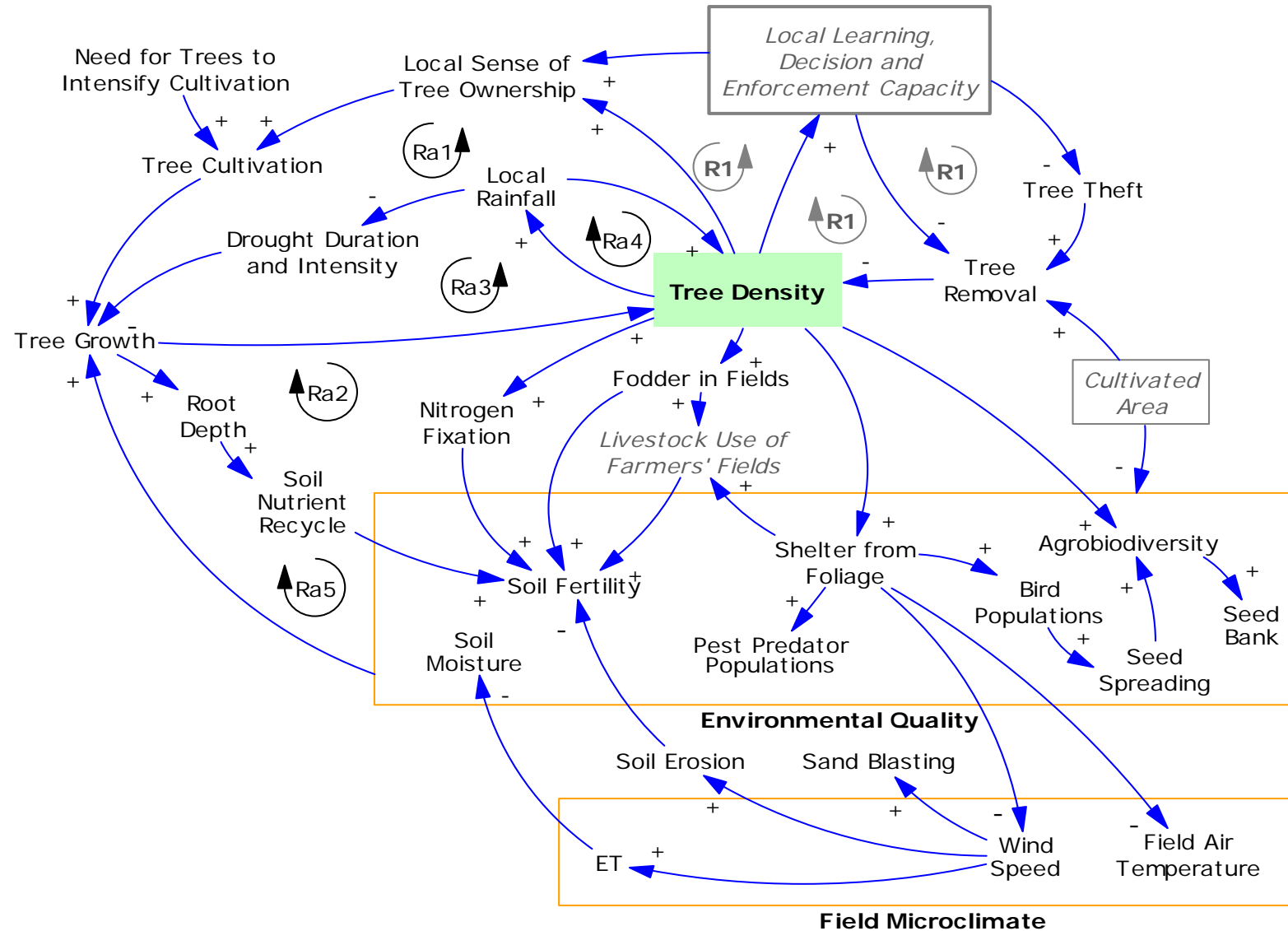
Tree Dynamics in the Fields



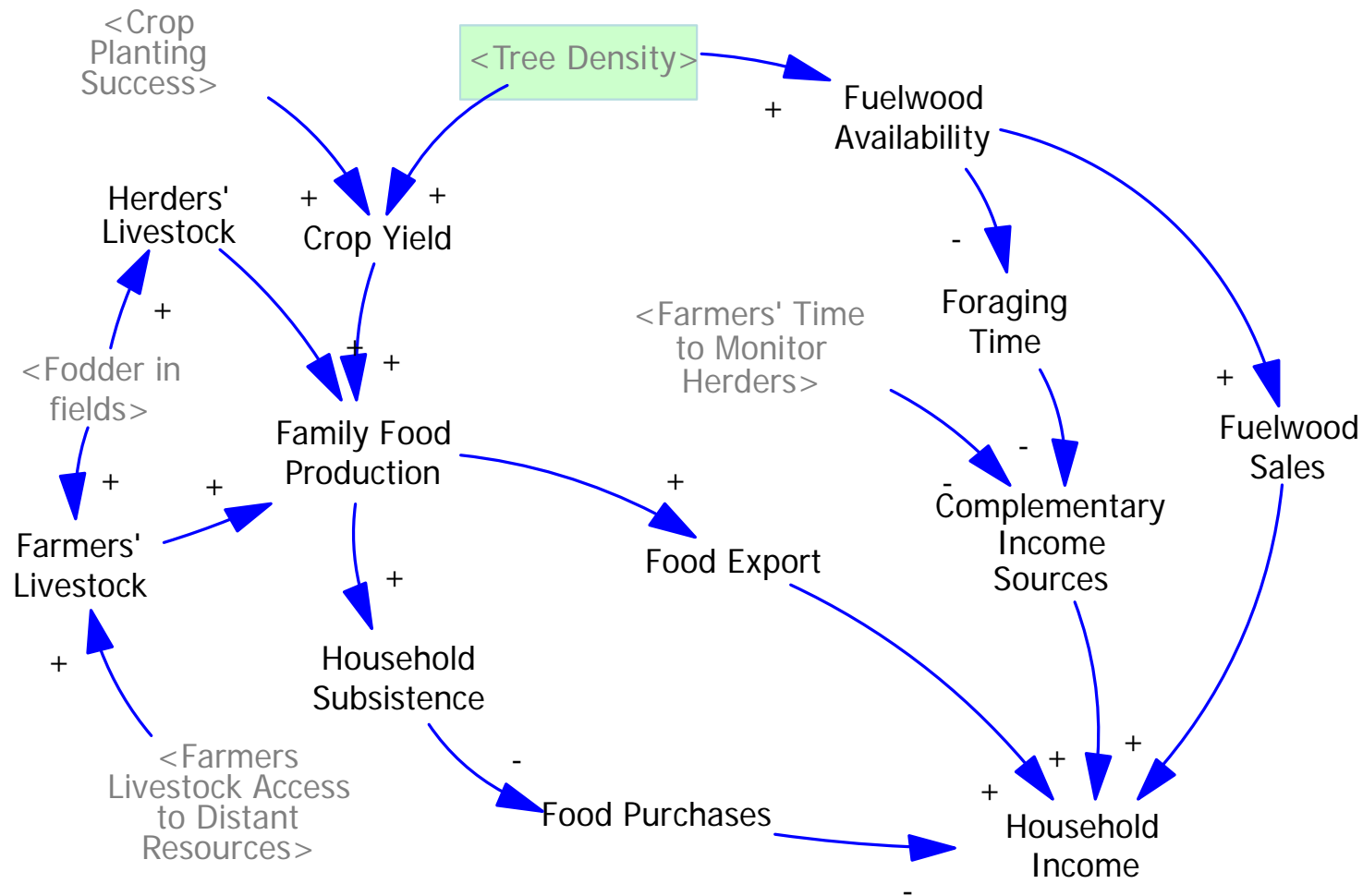
Trees in Farmers' Fields

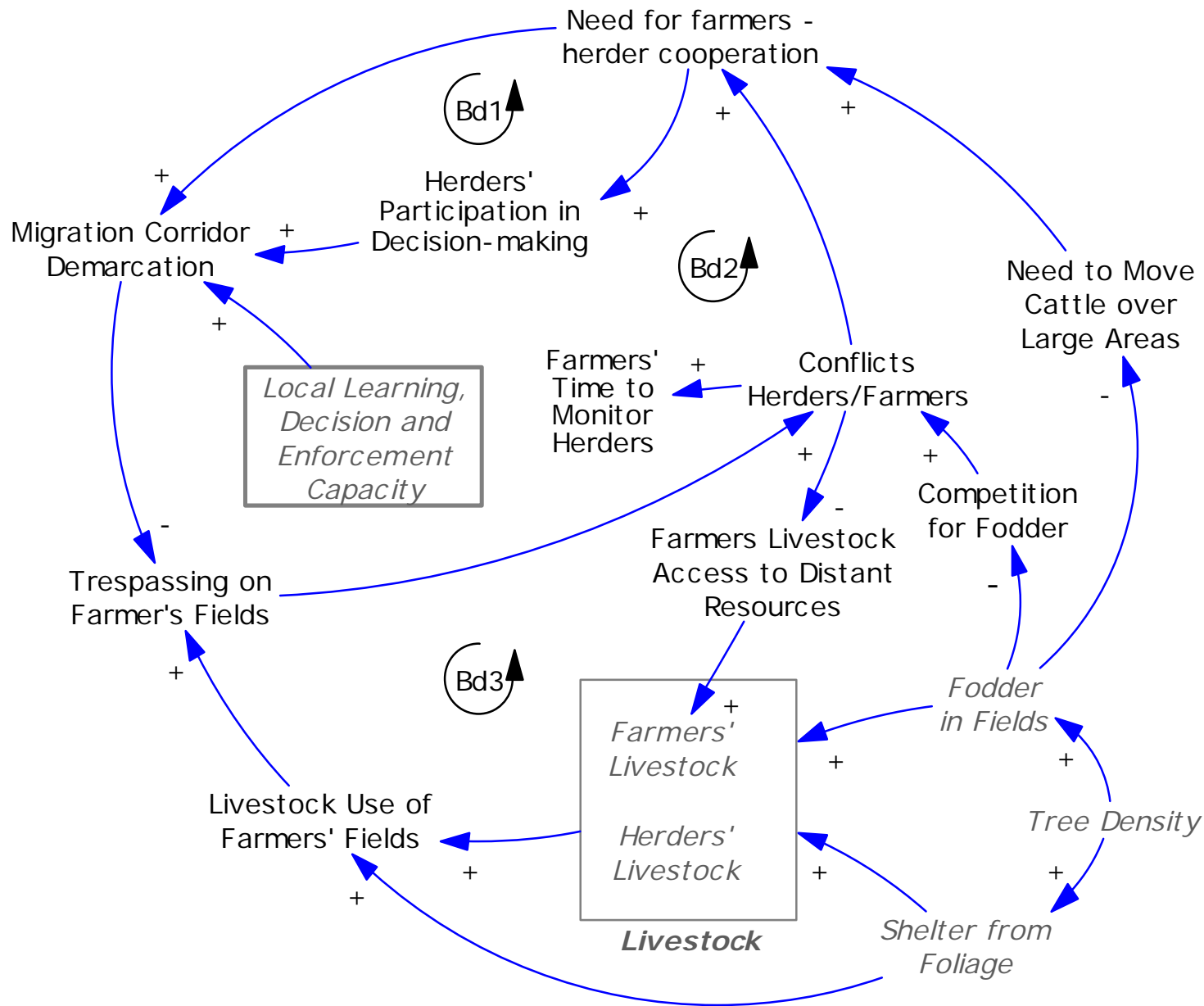


Trees in Farmers' Fields



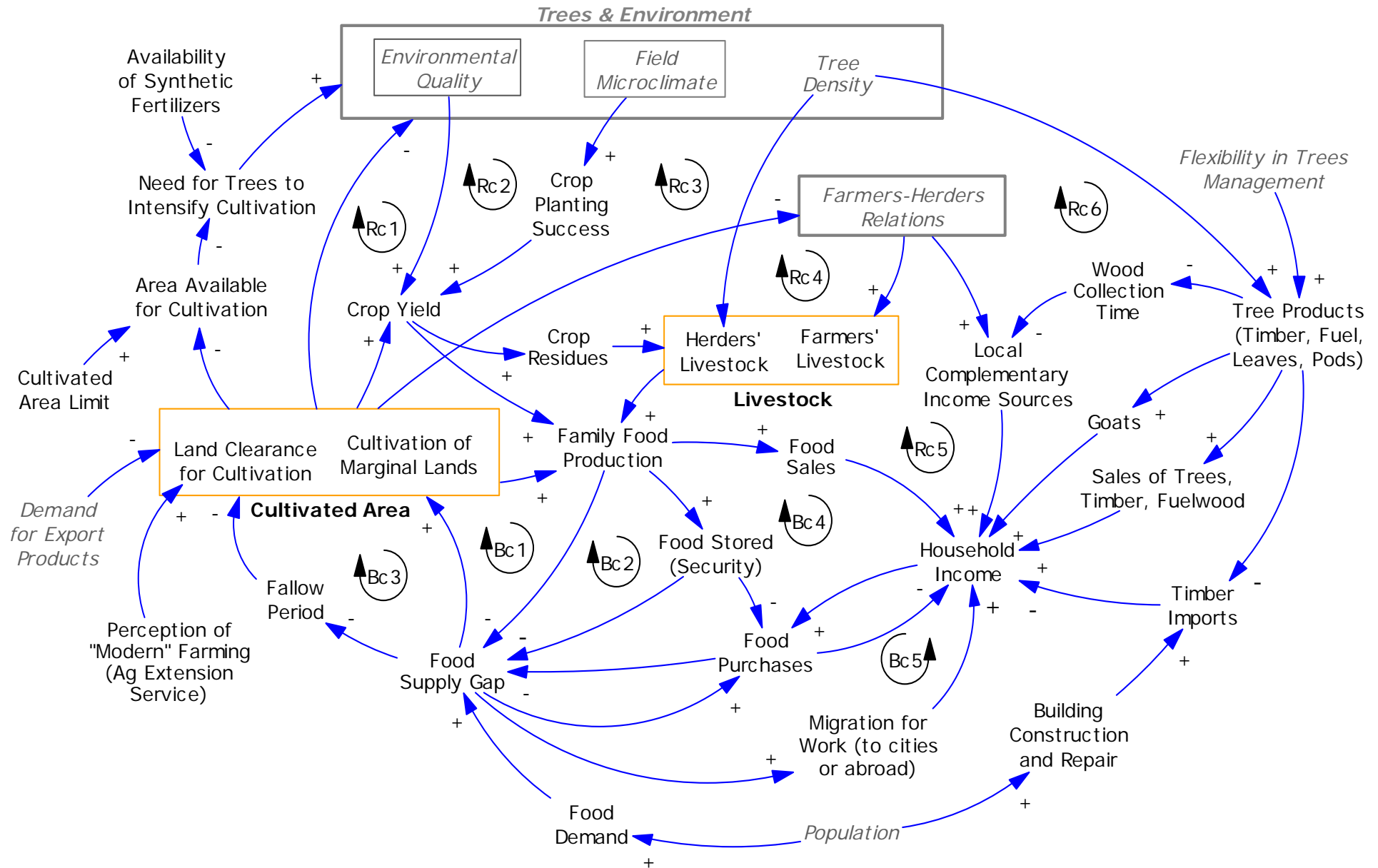
Household Economy





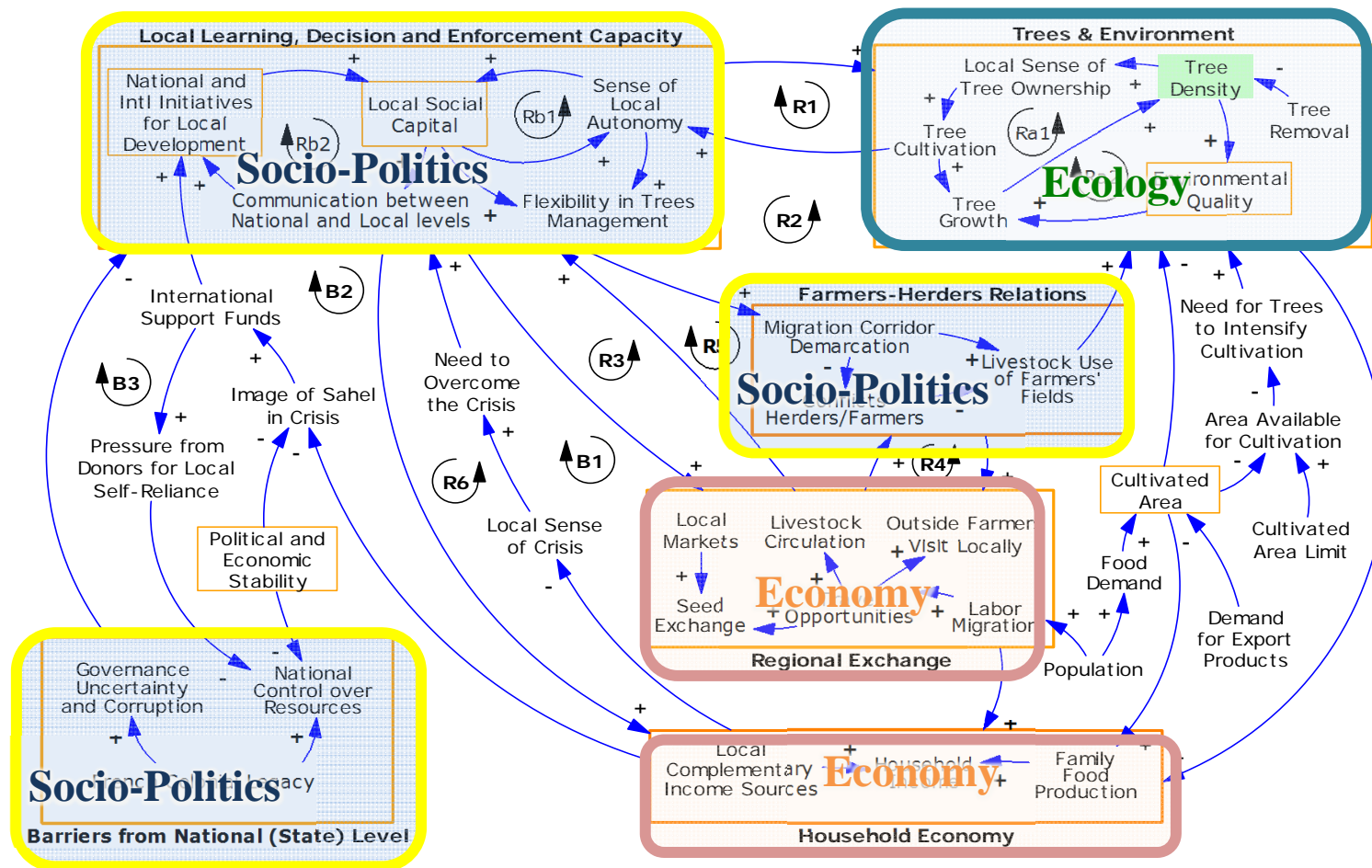
Farmer – Herder Relations

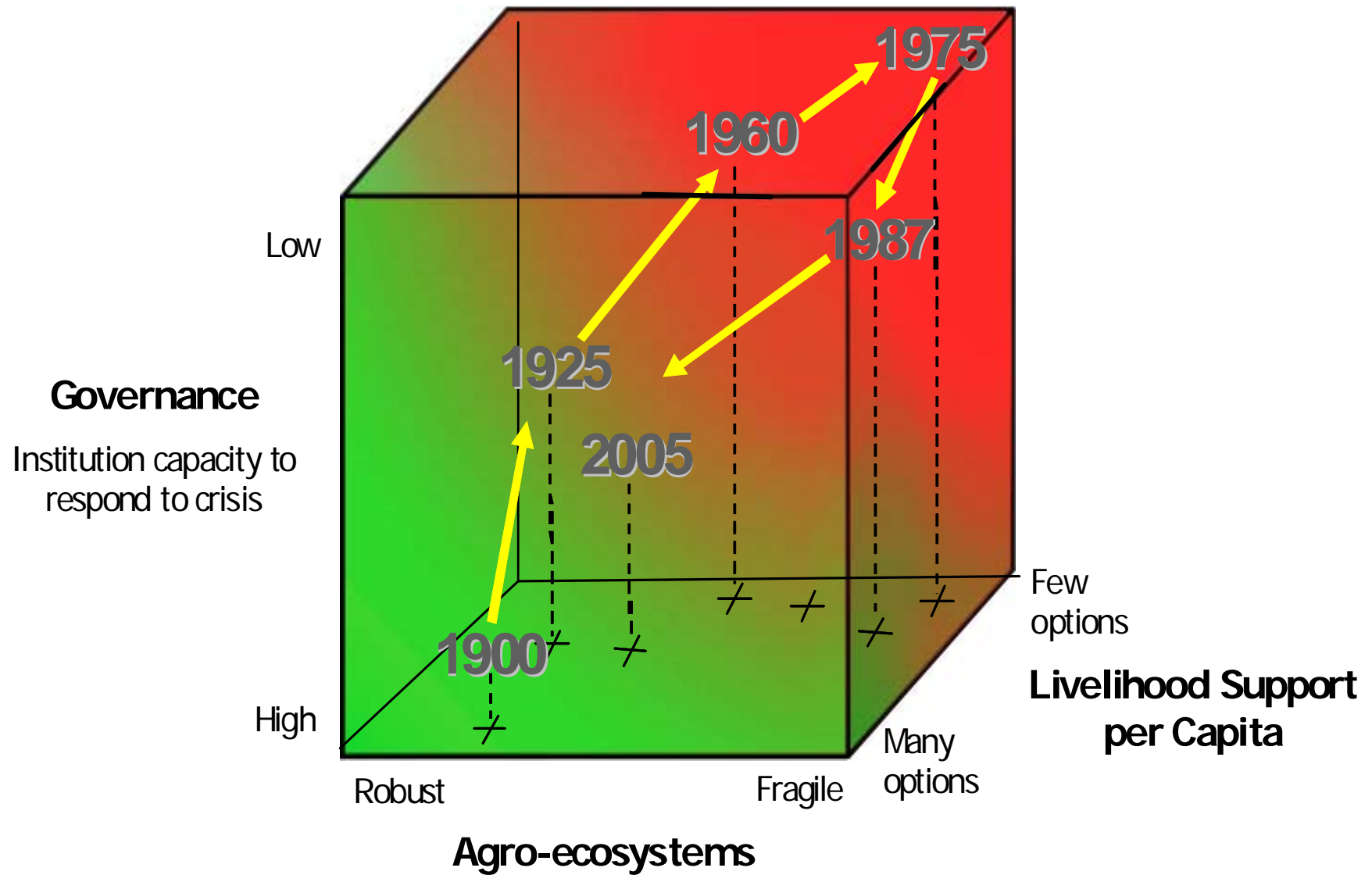
Community Economy



Not one perfect model!

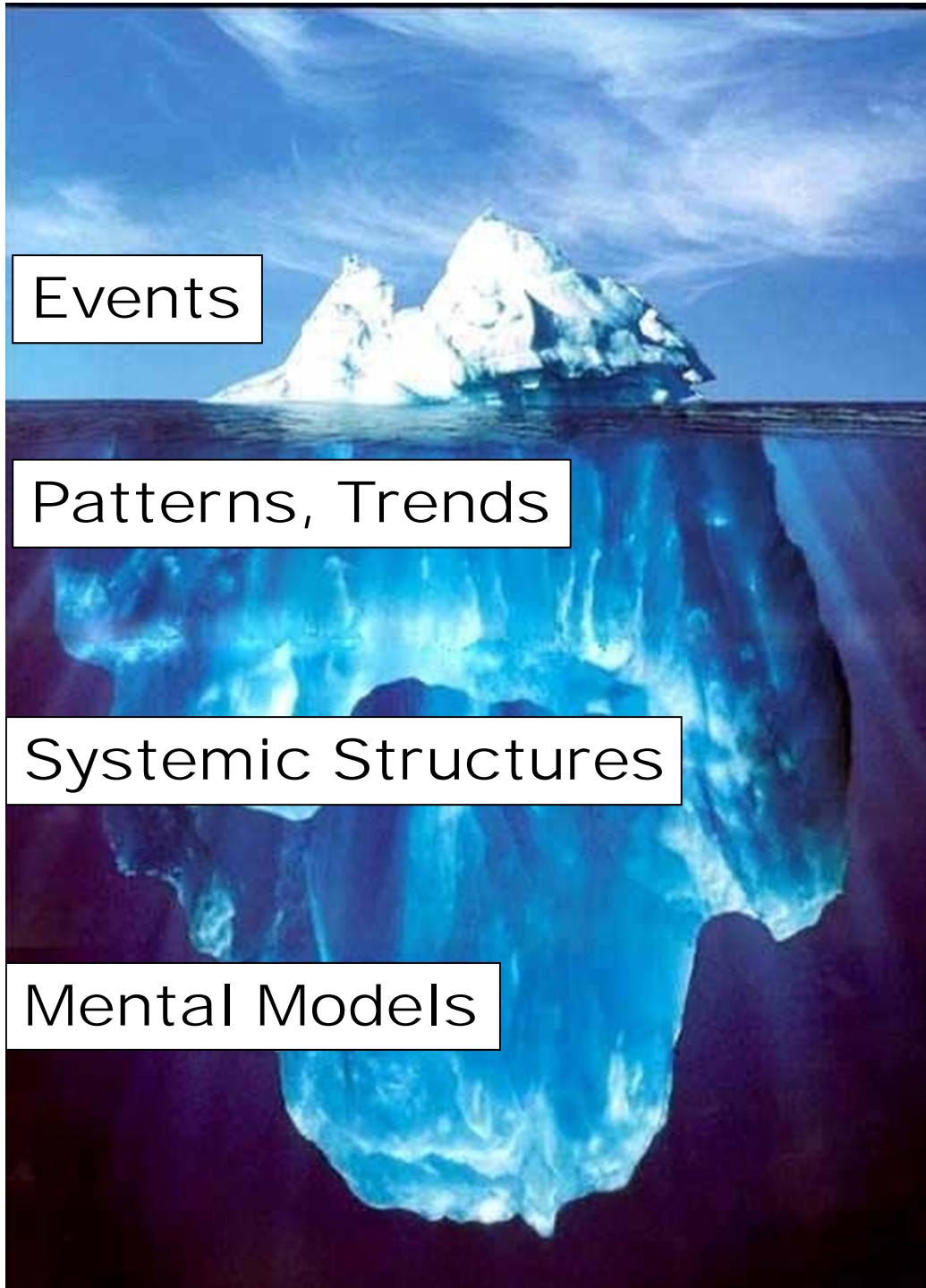
A family of models tells a wider story





Dynamics of Resilience and Vulnerability

For farmers and pastoralists in Maradi/Zinder regions of Niger (1900-2000)



Events

Patterns, Trends

Systemic Structures

Mental Models

What just happened?

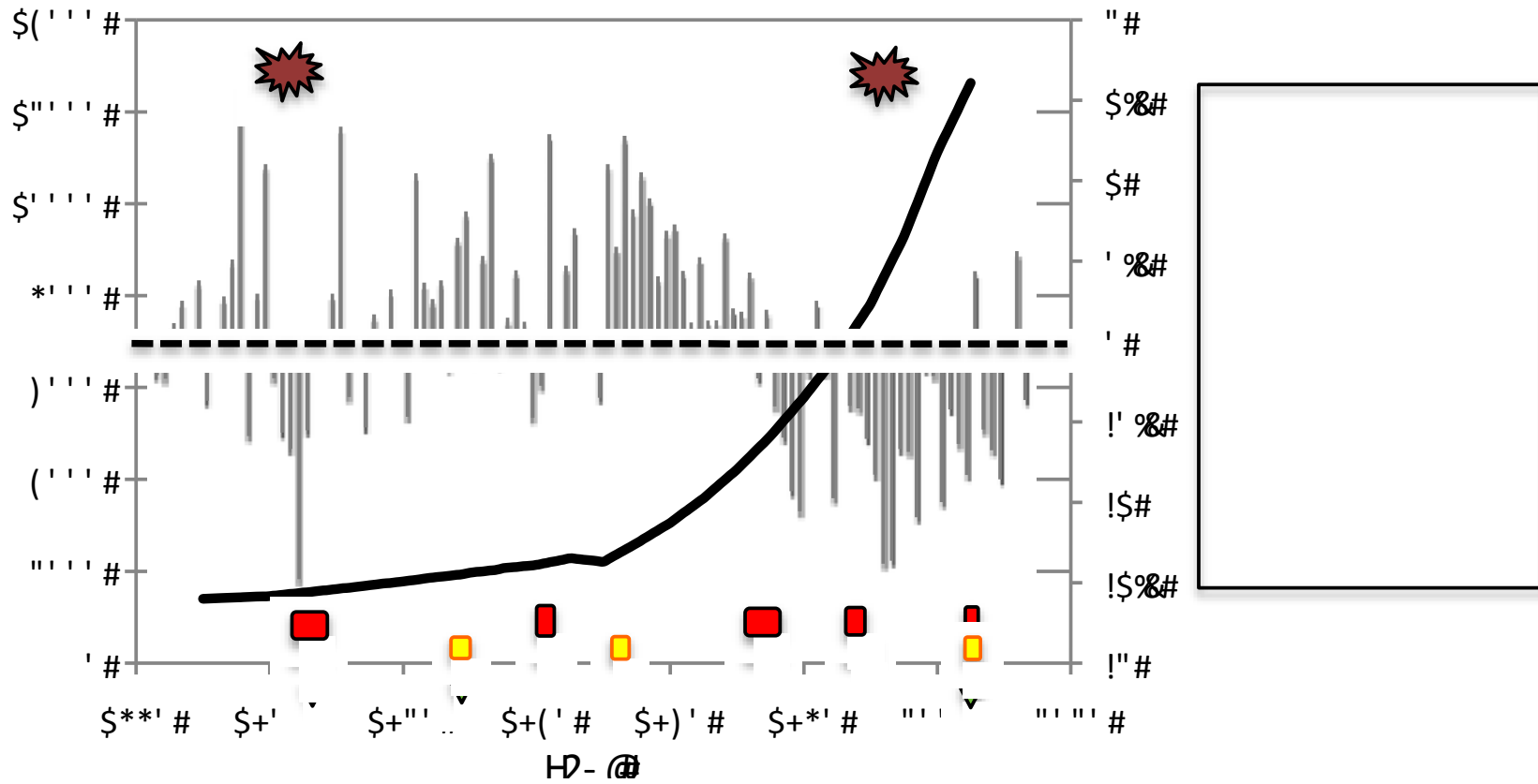
What's been happening?
Have we been here or some place similar before?

What are the forces at play contributing to these patterns?

What about our thinking allows this situation to persist?

Ways of explaining reality

Niger's Rising Challenge





Merci pour votre attention.

Thank you for your attention.

SusFish Burkina Project Organization

WP 1 – Project Coordination and Dissemination (BOKU and GDFR)

WP 6 – Education and Research (North and South Partners)

