Building Resilience for Adaptation to CC in Agriculture

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FAO

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Drivers of Change

Affecting biological processes

Pollution/Water quality

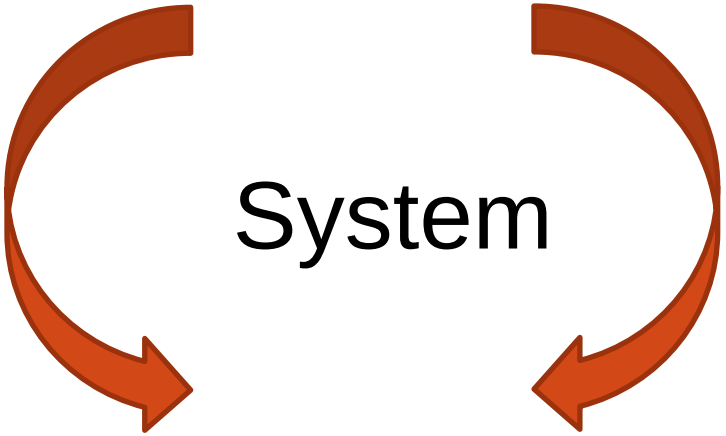
Climate

Acidification

Overfishing

Altered habitats

Etc…



Affecting human choices

Governance and politics

Legal systems

Technological change

Markets

Capital/labor flows

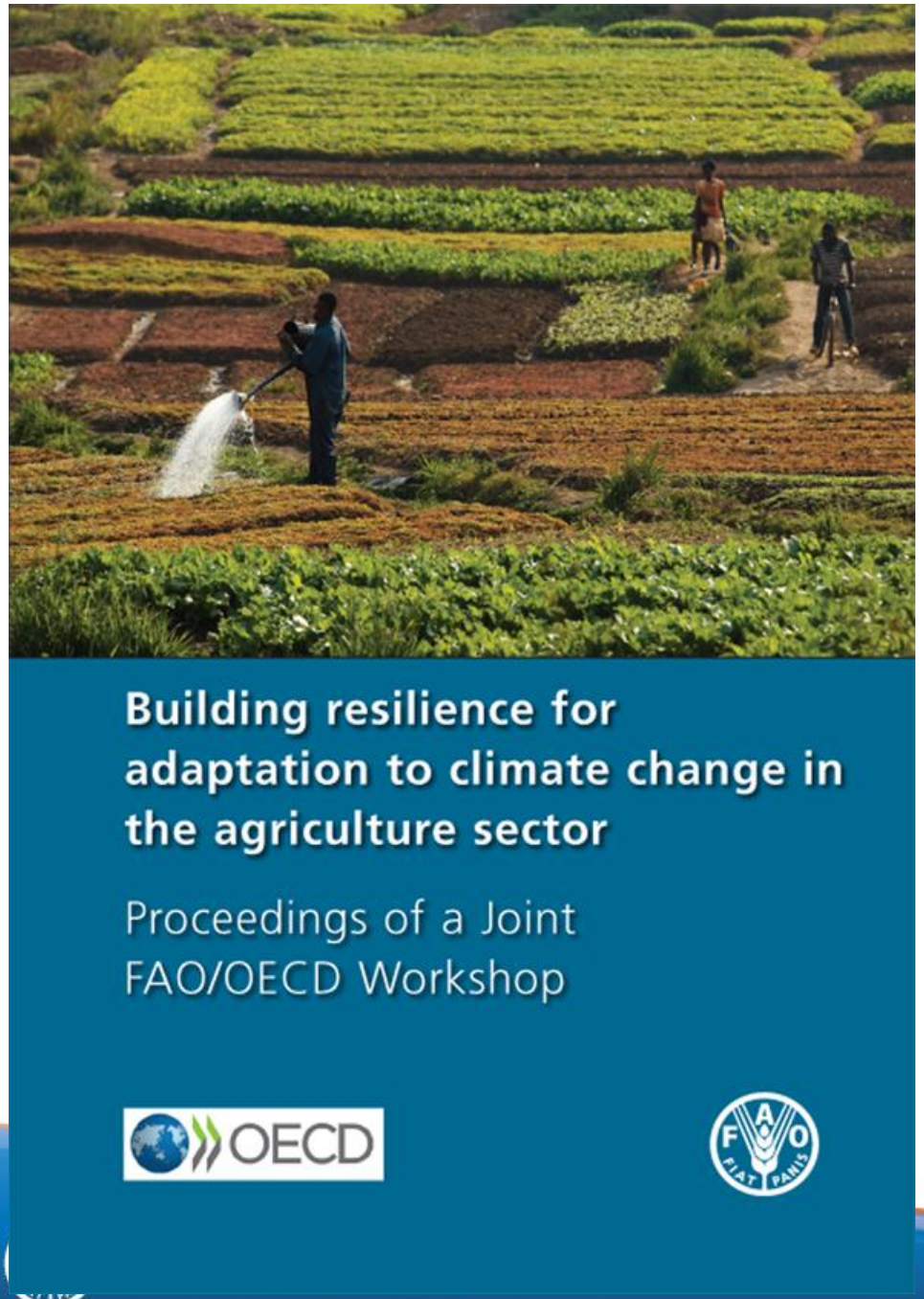
Demographics

Culture

Etc…

What CC changes?

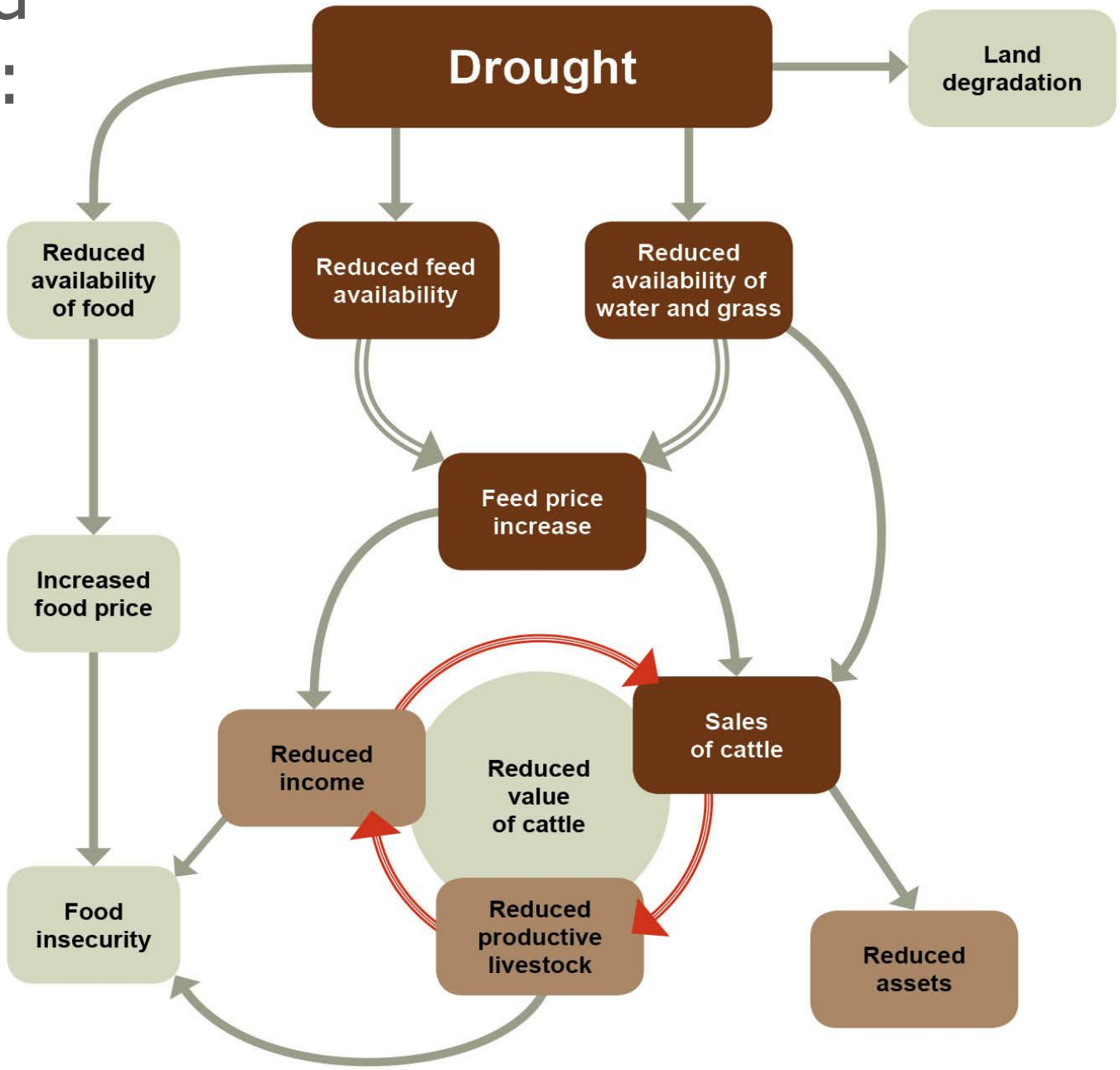
- New risks and opportunities
- More variability
- Changes existing risks
- More uncertainty



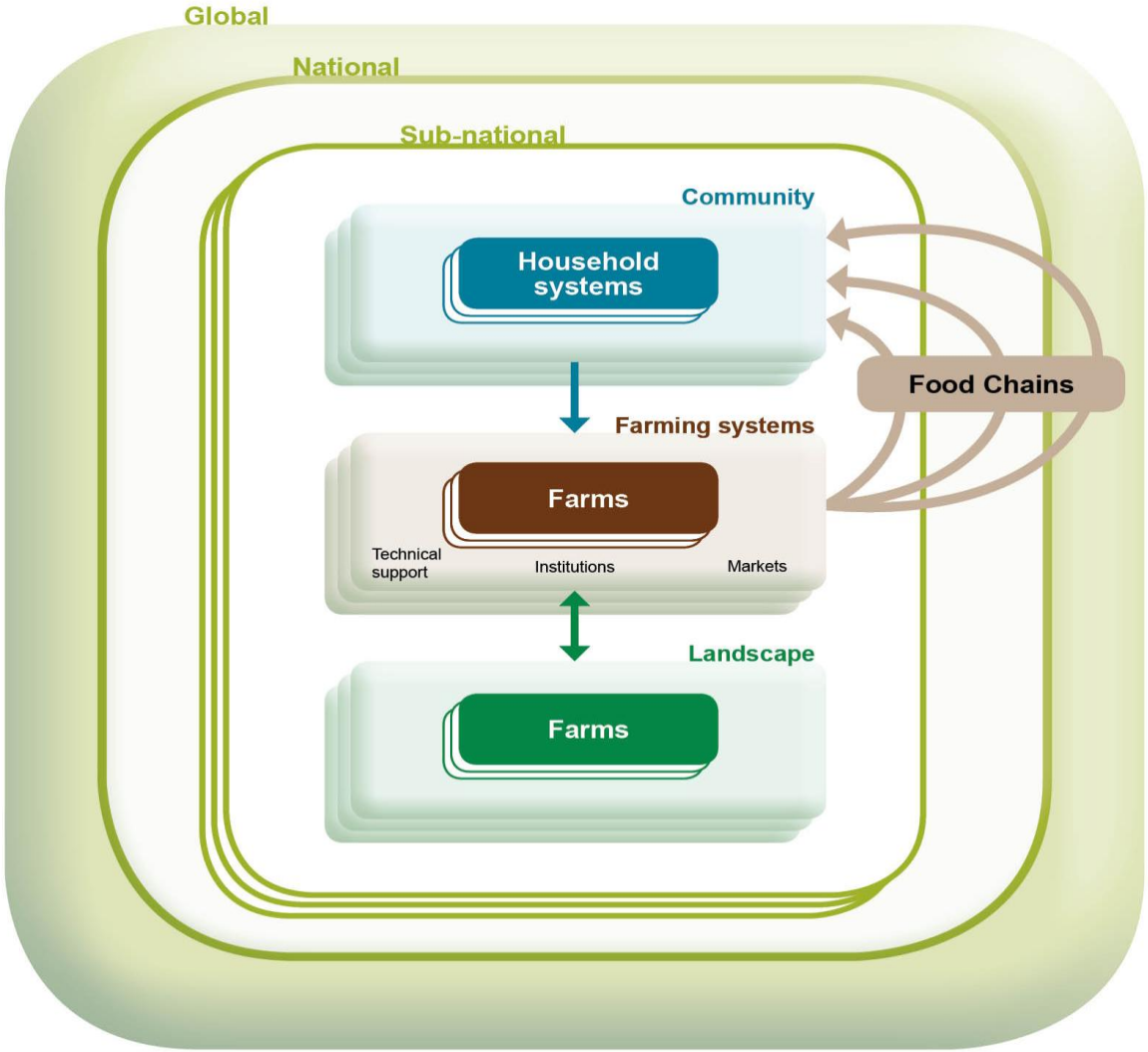
- Concepts
- Specific risks and risks management strategies
- Case studies
- National policies
- Different perspectives:
  Biophysical, Economic, social
- Different scales

Risks and Systems:

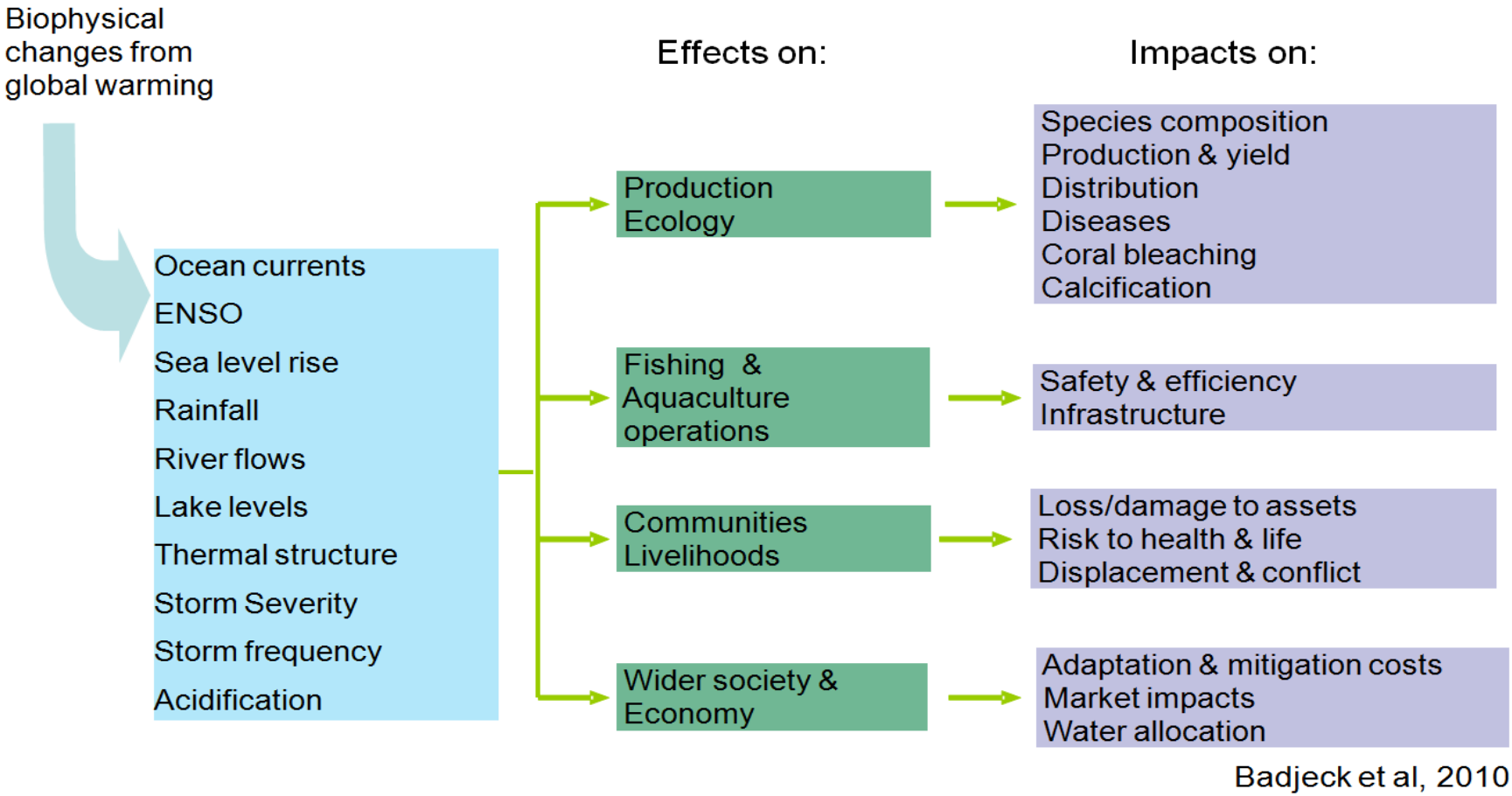
Impacts of a drought on livestock grazing systems



Systems at different scales

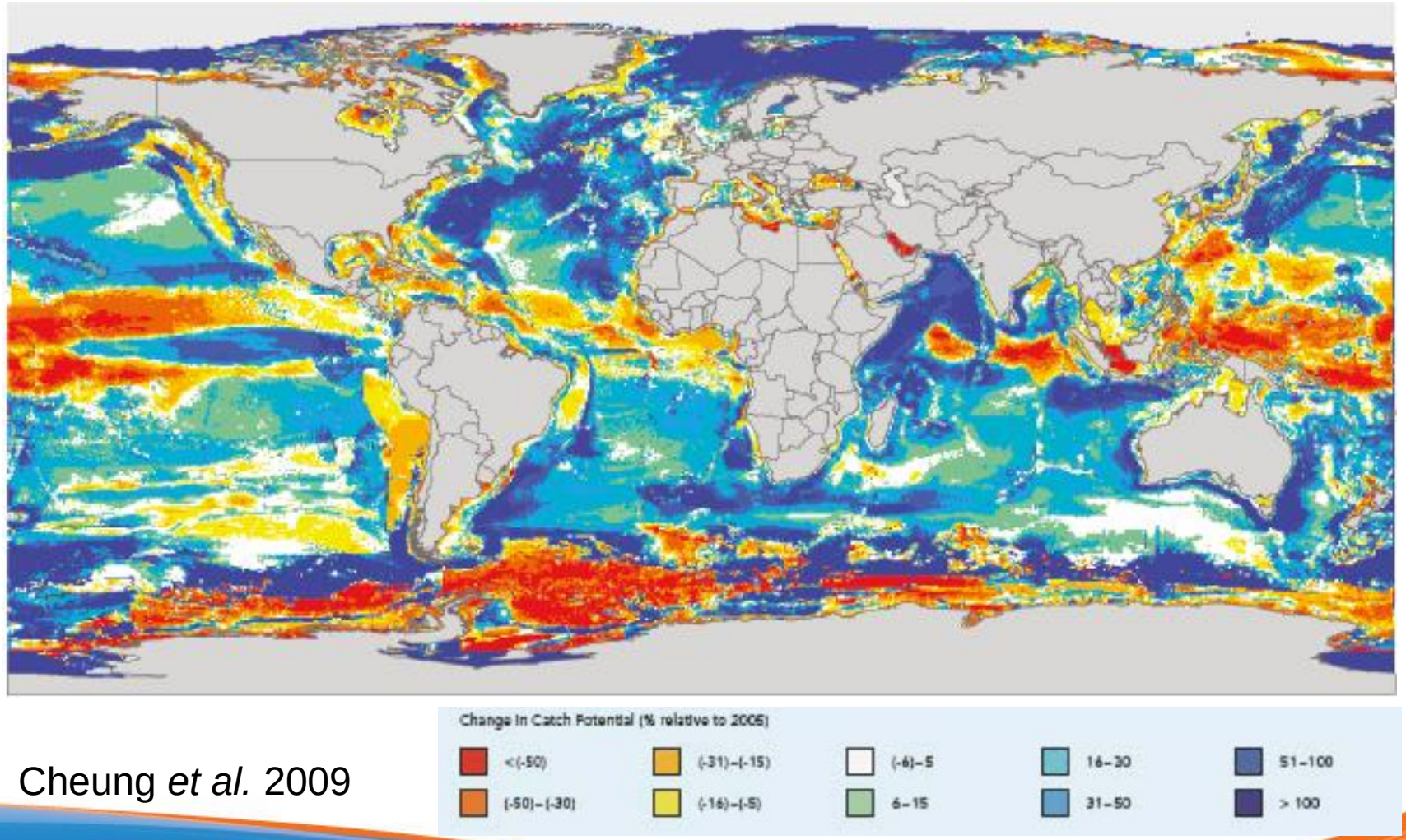


Climate change impacts on fisheries and aquaculture



Badjeck et al, 2010

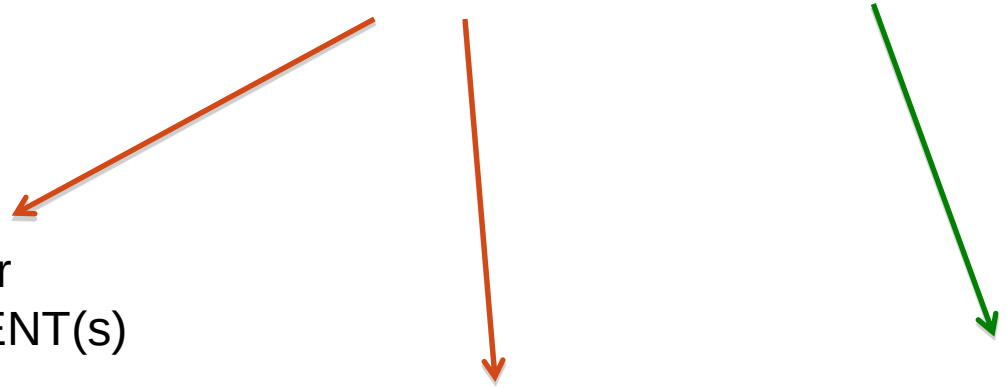
Predicted effects on fisheries' catch potential



Cheung *et al.* 2009

Vulnerabilities and vulnerability

Vulnerability of "**what**" to "**what**":



SYSTEM or COMPONENT(s)

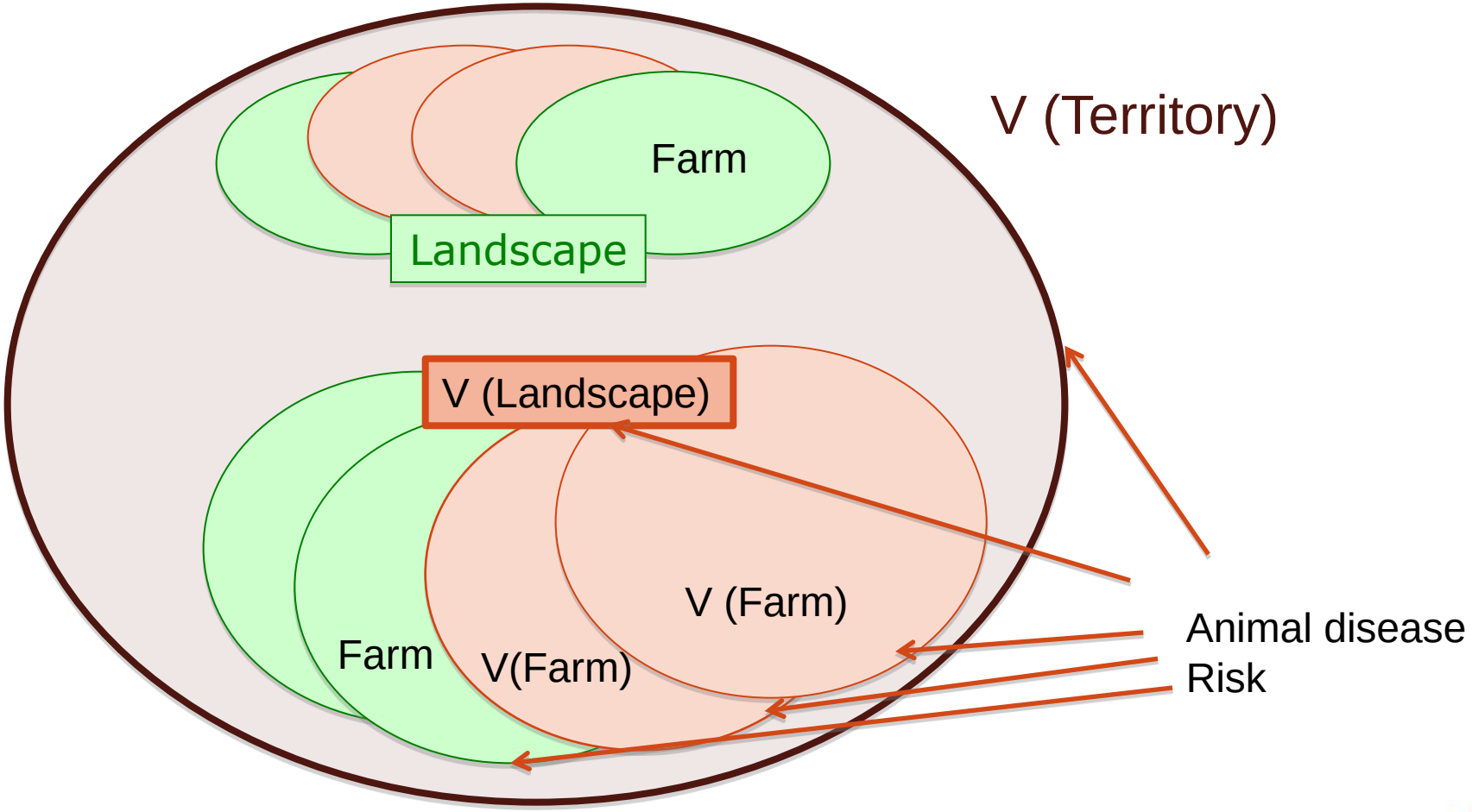
which "bear" the vulnerability

DOMAIN(s)

Variable/quality/dimension(s) which characterize the entry of the system in an affected state

RISK or SET of RISKS

Vulnerability at scales



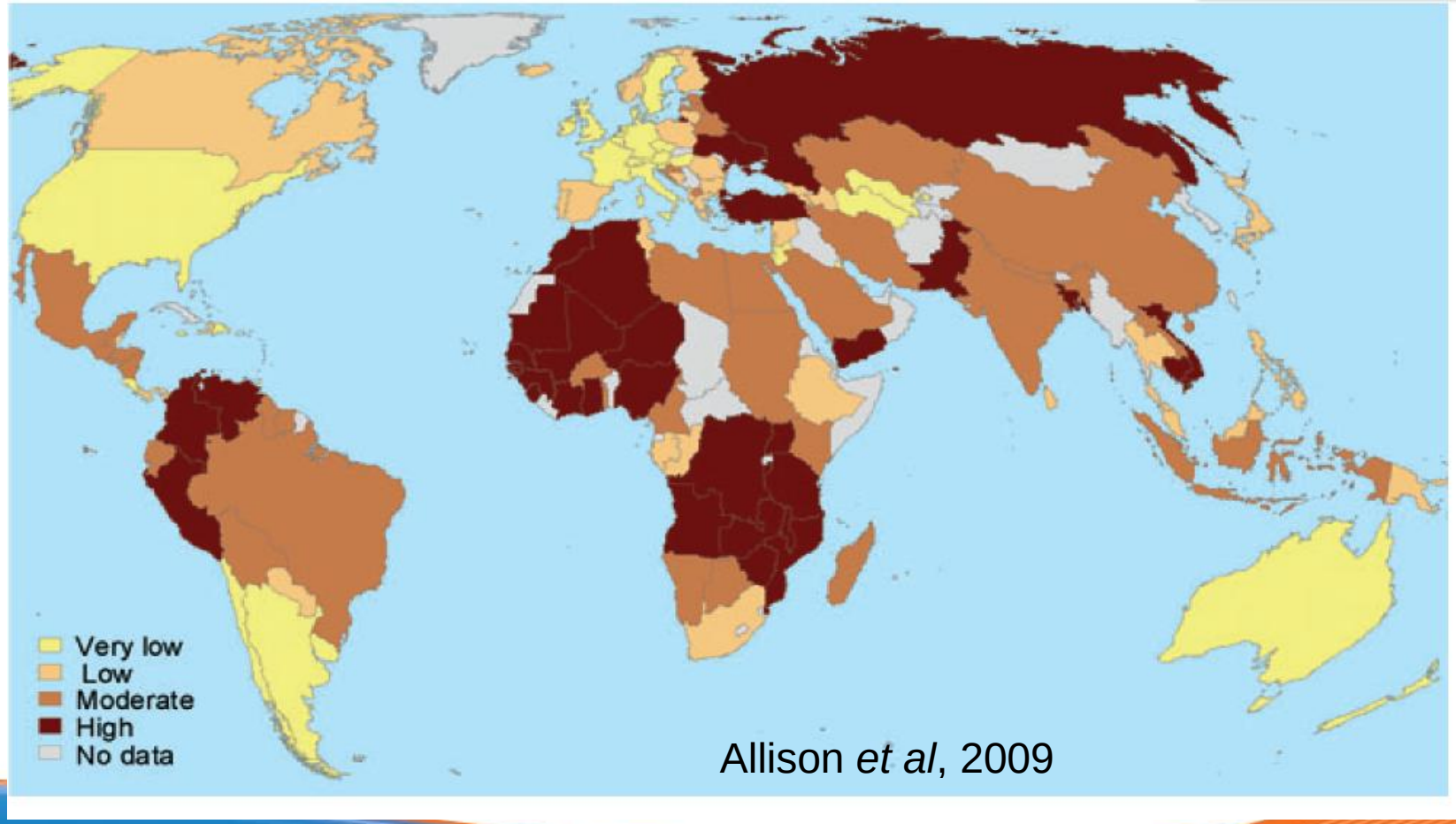
Vulnerability at scales
Compounding effects

From one level to another, vulnerabilities can either :

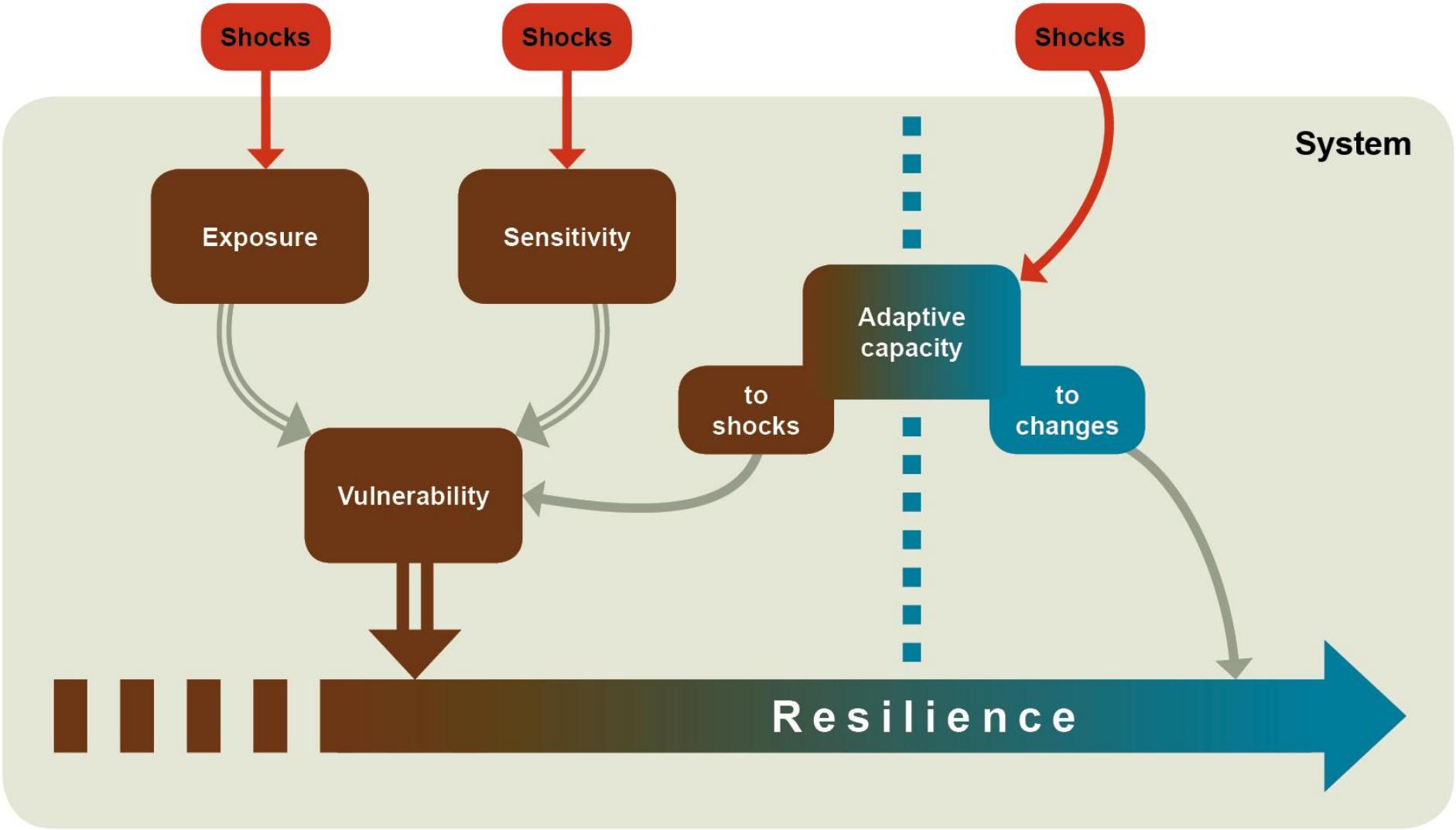
- Add themselves (+)
- Compensate each other (- ÷ √)
- Amplify each other (×)

Understanding vulnerabilities: applied fisheries example

Global mapping of national economies' vulnerability to climate change impacts on fisheries



Resilience


Shocks
Shocks
Shocks
System
Exposure
Sensitivity
Adaptive capacity
to shocks
to changes
Vulnerability
Resilience

Preparing and responding to the impacts: adaptation to climate change through broader vulnerability reduction

- Ecological, Economic and Social Resilience
  - implementation of systems approaches to agriculture, forestry, fisheries and aquaculture
  - livelihood diversification, flexible access rights, public and private insurance
- Technological innovation (seeds, species, IT, etc)
- Planned adaptation –policy coherence across sectors (e.g water, agriculture, forestry, fisheries, coastal zone management)
- Disaster preparedness and response

Key features of the systems approach: Basic Objectives

- Maintaining ecosystem integrity / ecological well being
- Improving human well-being and equity
- Promoting/enabling good governance

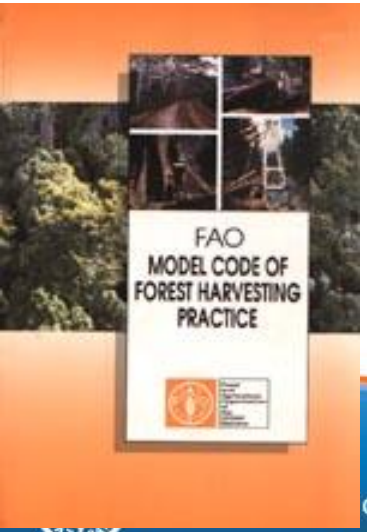
Comprehensive strategies to build resilience in a context of climate change

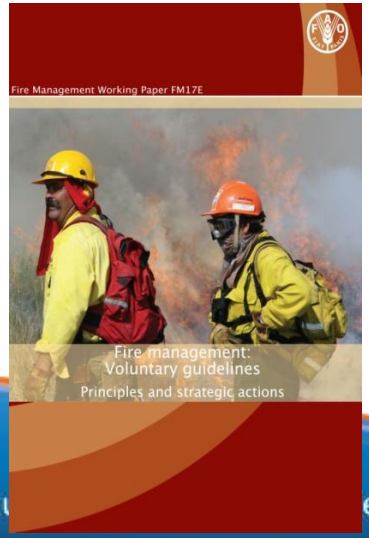
- Identify/understand all the risks, vulnerabilities, systems, dimensions, tools and their targets, and how CC act on them, is necessary prior to integration in a comprehensive approach towards resilience
- Reduce, or take account of amplification effects between risks
- Organize compensation

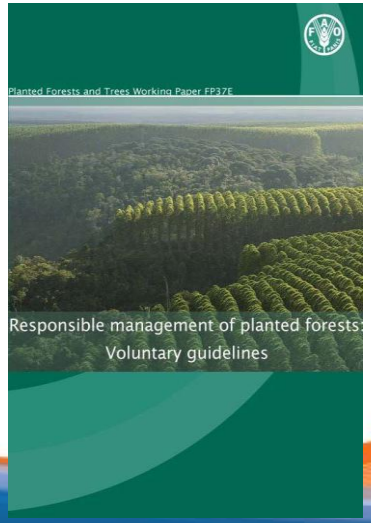
Building resilience in/through forestry

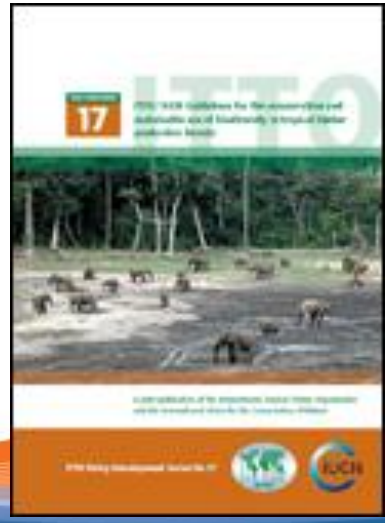
- **Maximize resilience of forest ecosystems**
- **Use forests and trees to increase human resilience**
- **Build resilient landscapes**
- **Adopt forest policies and build institutions conducive to resilience**

Tools to profile and manage risks









Building adaptive capacity to changes: address uncertainty

Diversification

Animal genetics

Genetic resources

Integrated watershed management

Jhikhu Khola, Nepal
Forests integrated in farming systems and in the landscape

Bodomo watershed, Faizabad District, Tajikistan.
Land use plan developed through a participatory process

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Dryland agroforestry systems

Guinea. Mosaic of crop fields, pastures and houses with boundary trees and wind breaks

Mali. Parkland agroforestry systems. Acacia in sorghum fields, livestock in fields after harvest

FAO Forestry

Policies & institutions supporting resilience

- **Coordinated action and policies at national level**
- **Strong local institutions**
- **Capabilities for monitoring**
- **Support adaptive research**