WB/FAO Expert Meeting : **Investing in Agriculture and Natural Resources Management in the context of Climate Change in East Asia and the Pacific**, 14-16 May Bangkok

Resilience for adaptation to climate change

Alexandre Meybeck,
Vincent Gitz, FAO

Outline

- **Systems**
- **Risks** in a context of climate change
- **Vulnerabilities**
- **Resilience**
- **Lessons for strategies** to build resilience for adaptation to climate change

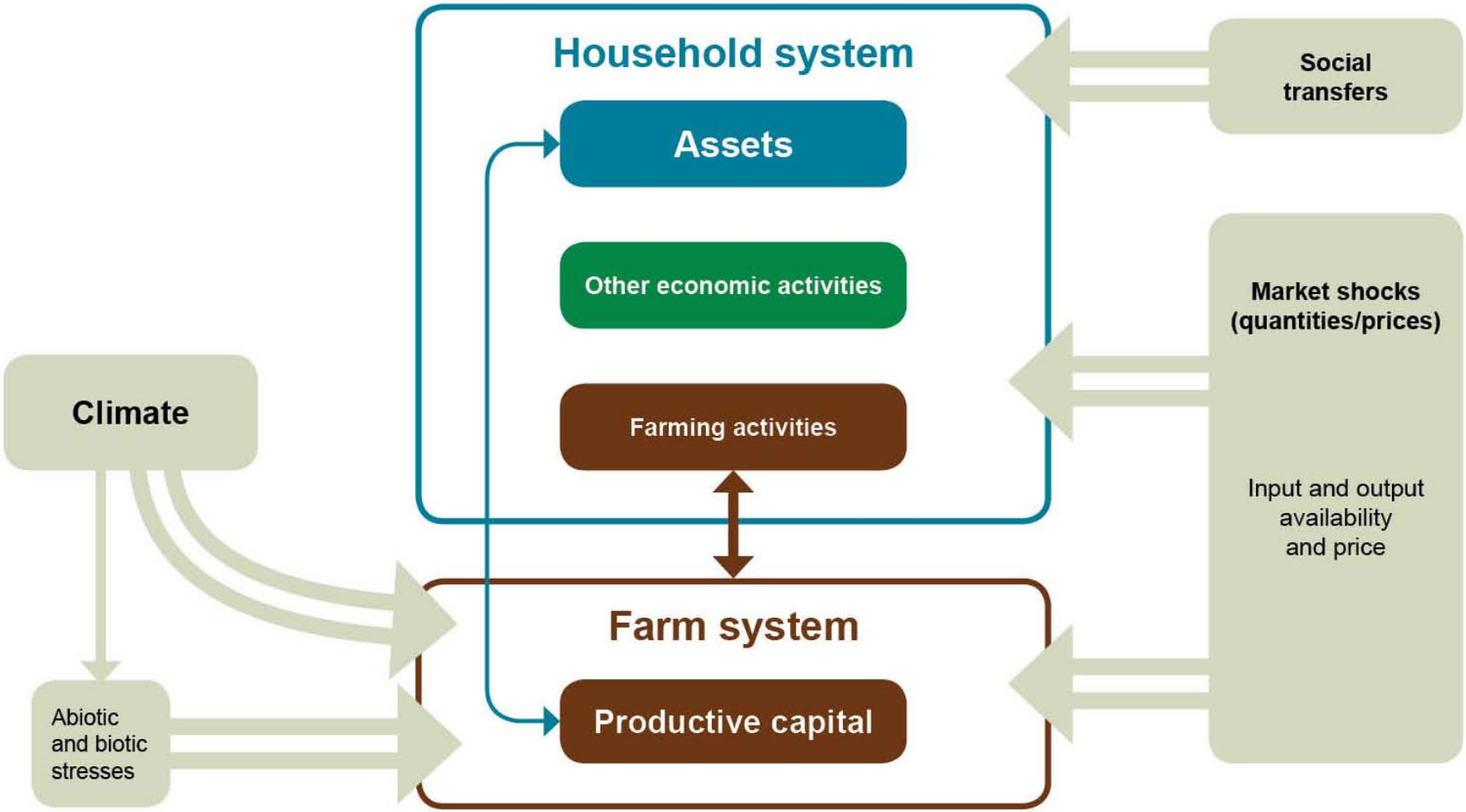
Systems

- Systems can be delineated according to **various perspectives, including expected functions:** environmental, economic or social, political and institutional.
- These **perspectives are linked**.
- Systems in different perspectives **share components.**
- Systems can be **embedded into one another**, meaning that one system can be a component of a major system.

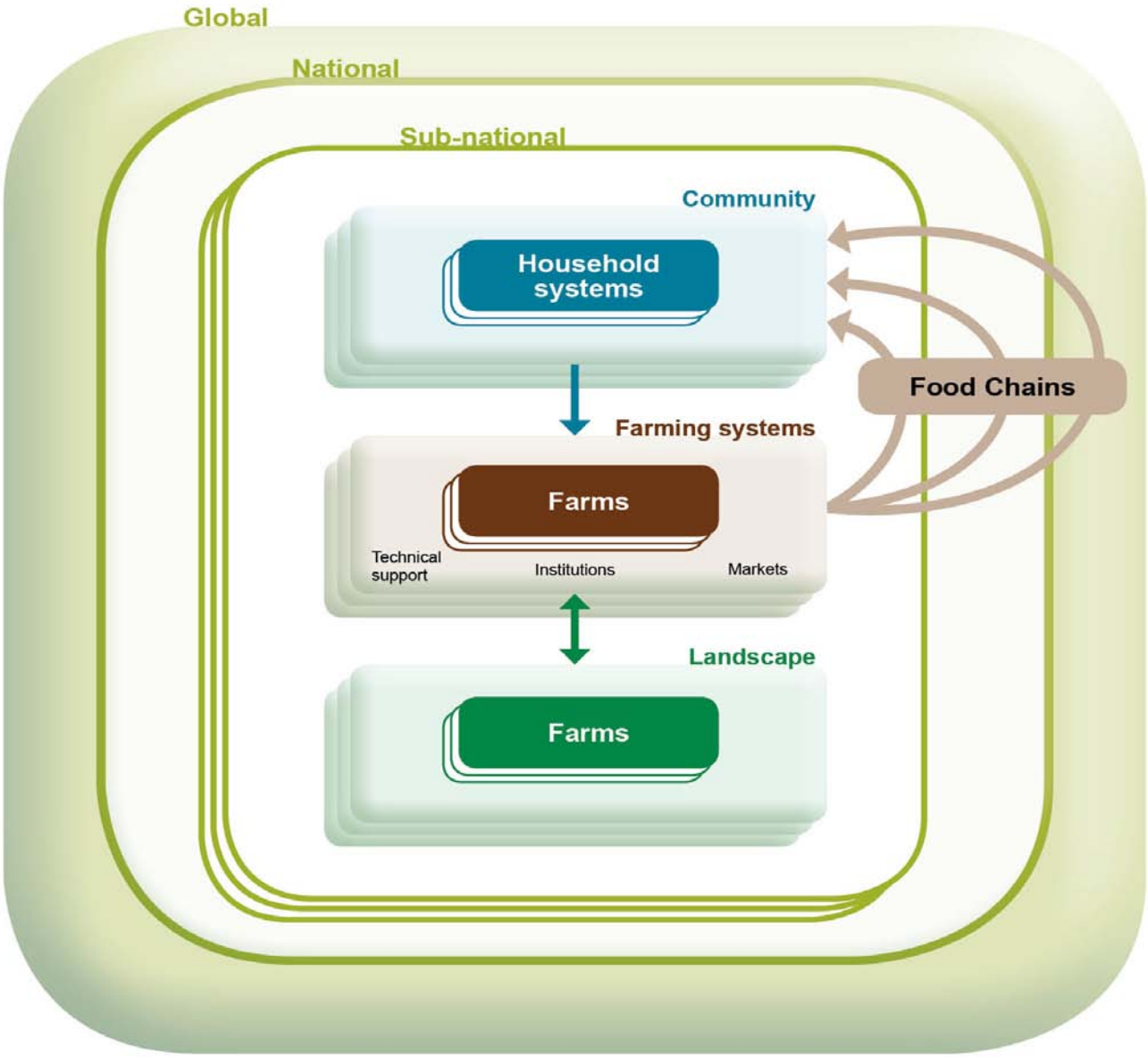
Systems in scales and domains

	1	2	3	4	5
Food production	Farms	Farming systems and Food chain(s)	National	Regional	Global
Food Security	Households	Communities	National	Regional	Global
Biophysical	Farms	Landscapes	National	Regional	Global

Household and farm systems linkages

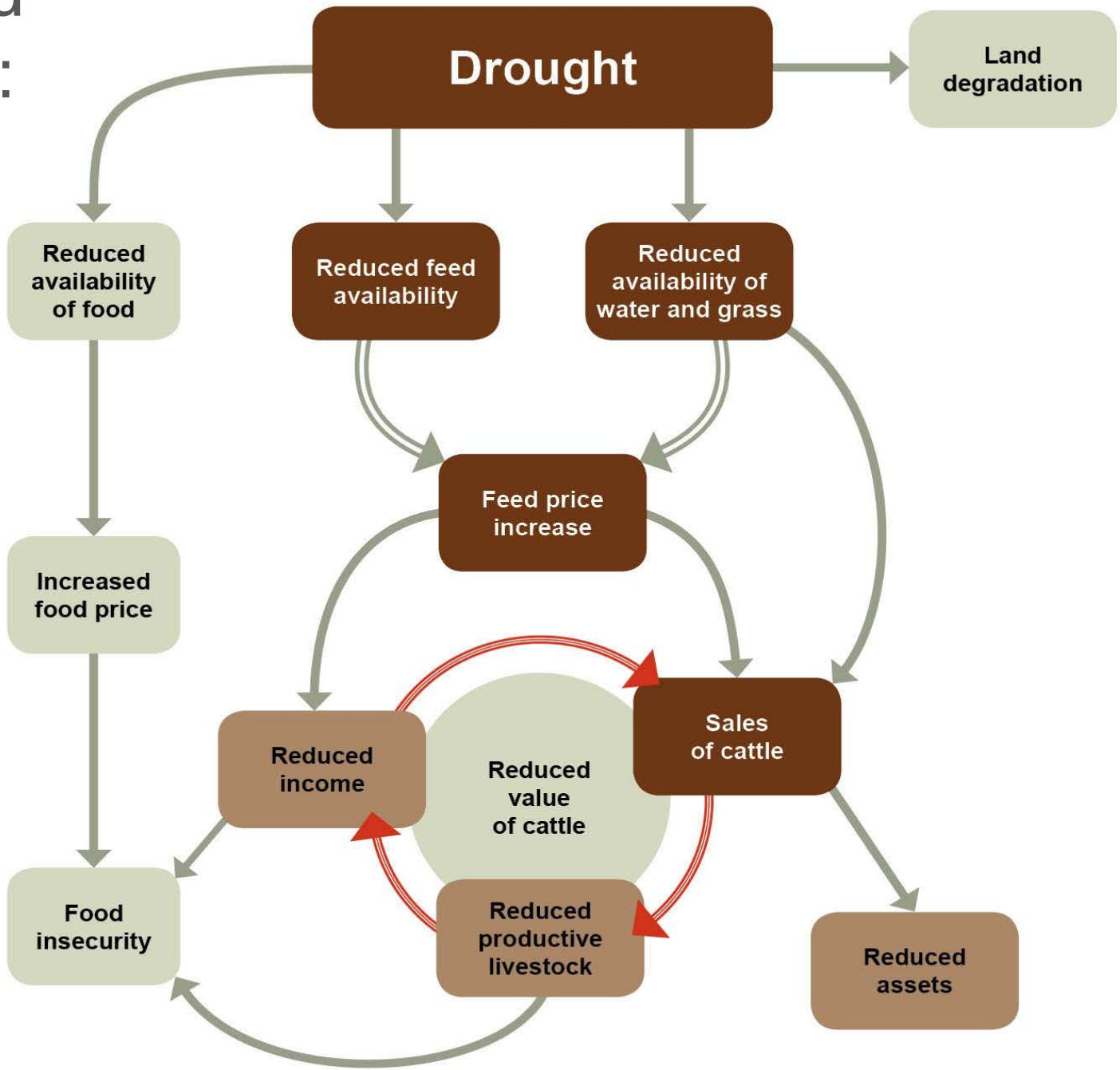


Systems at different scales

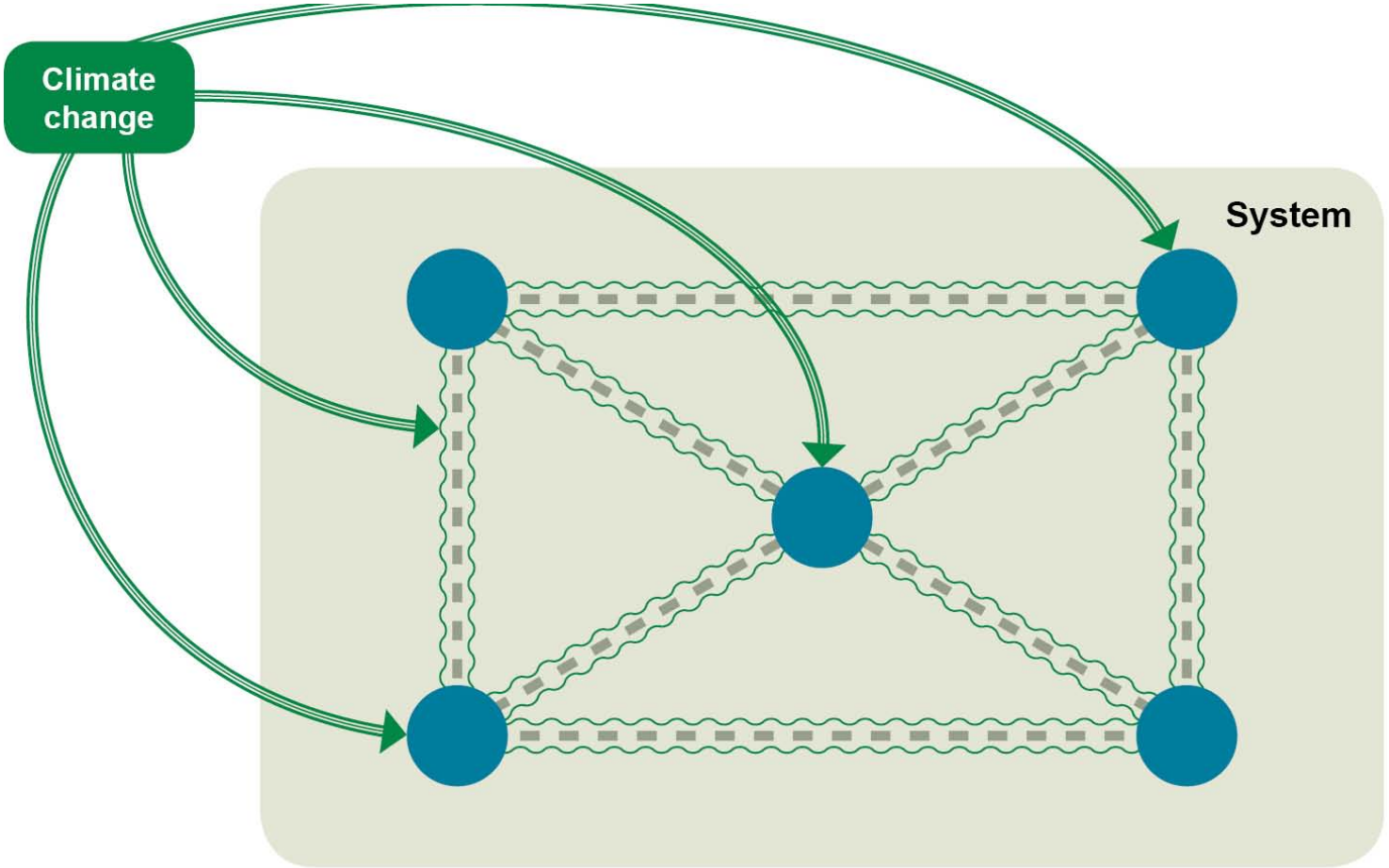


Risks and Systems:

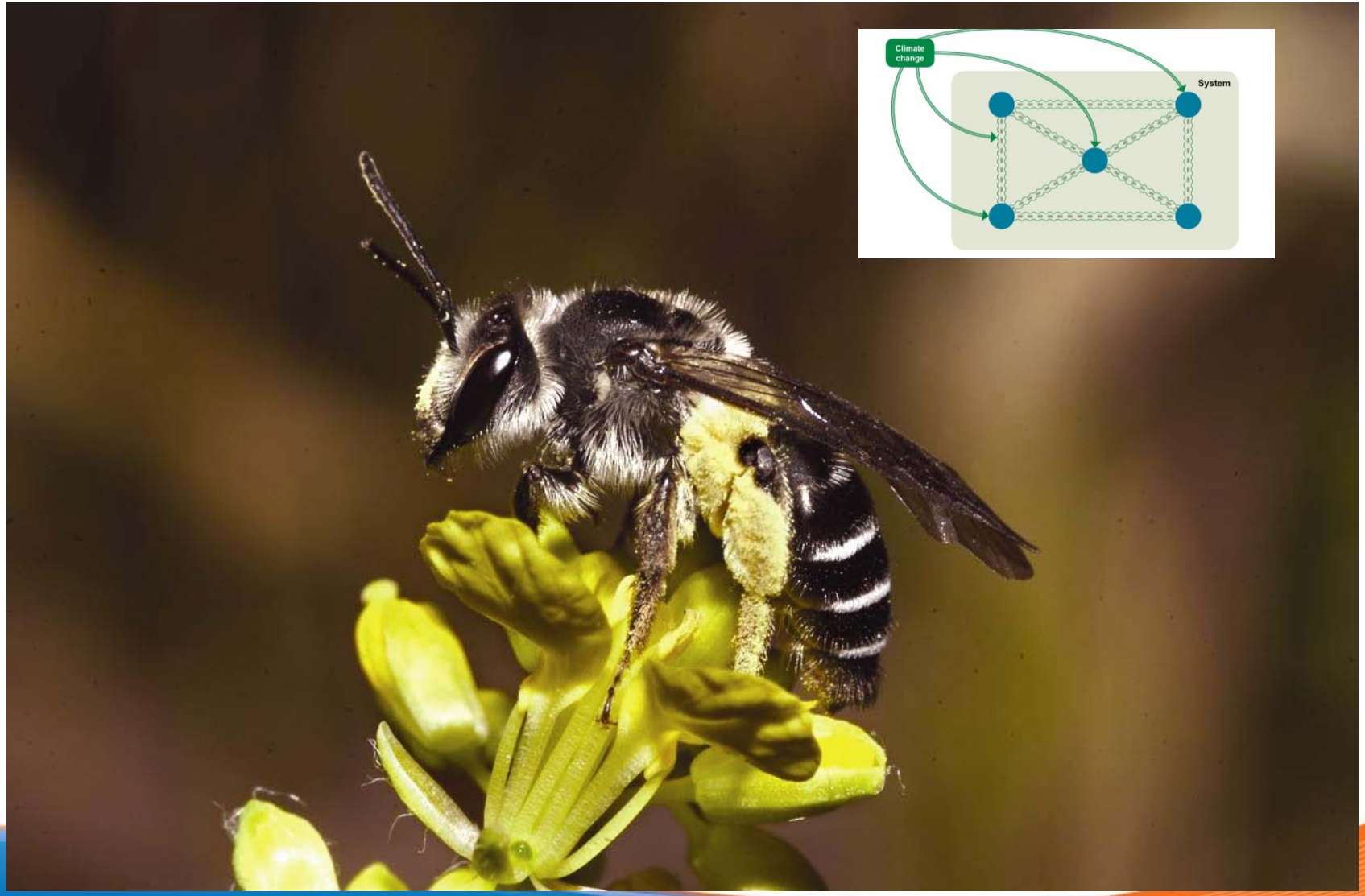
Impacts of a drought on livestock grazing systems



CC: Effects on a system

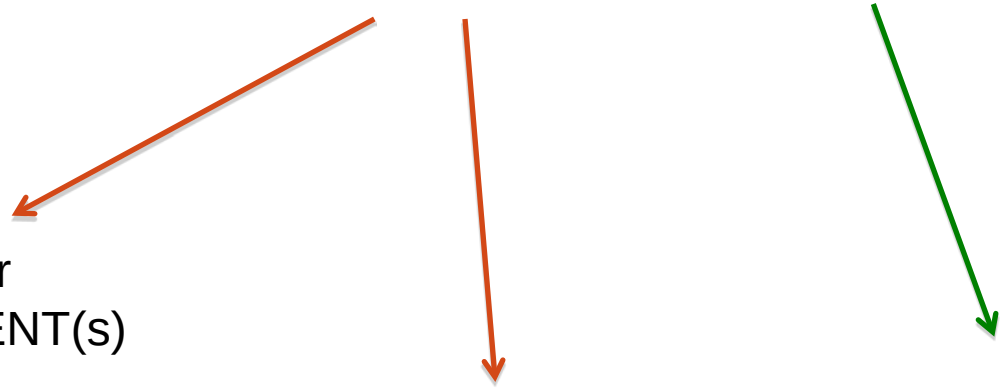


Impacts on ecosystems



Vulnerabilities and vulnerability

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



SYSTEM or COMPONENT(s)

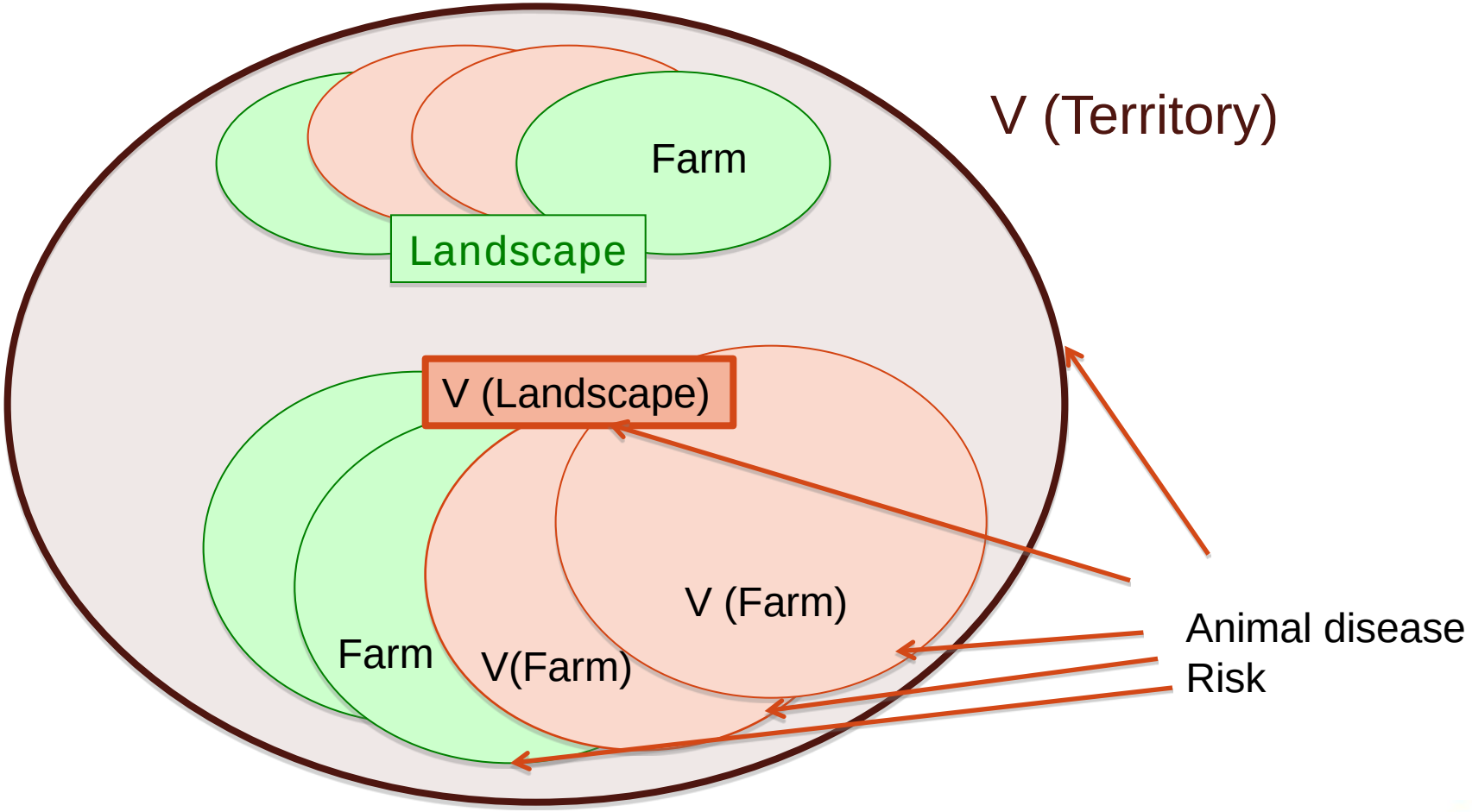
which "bear" the vulnerability

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

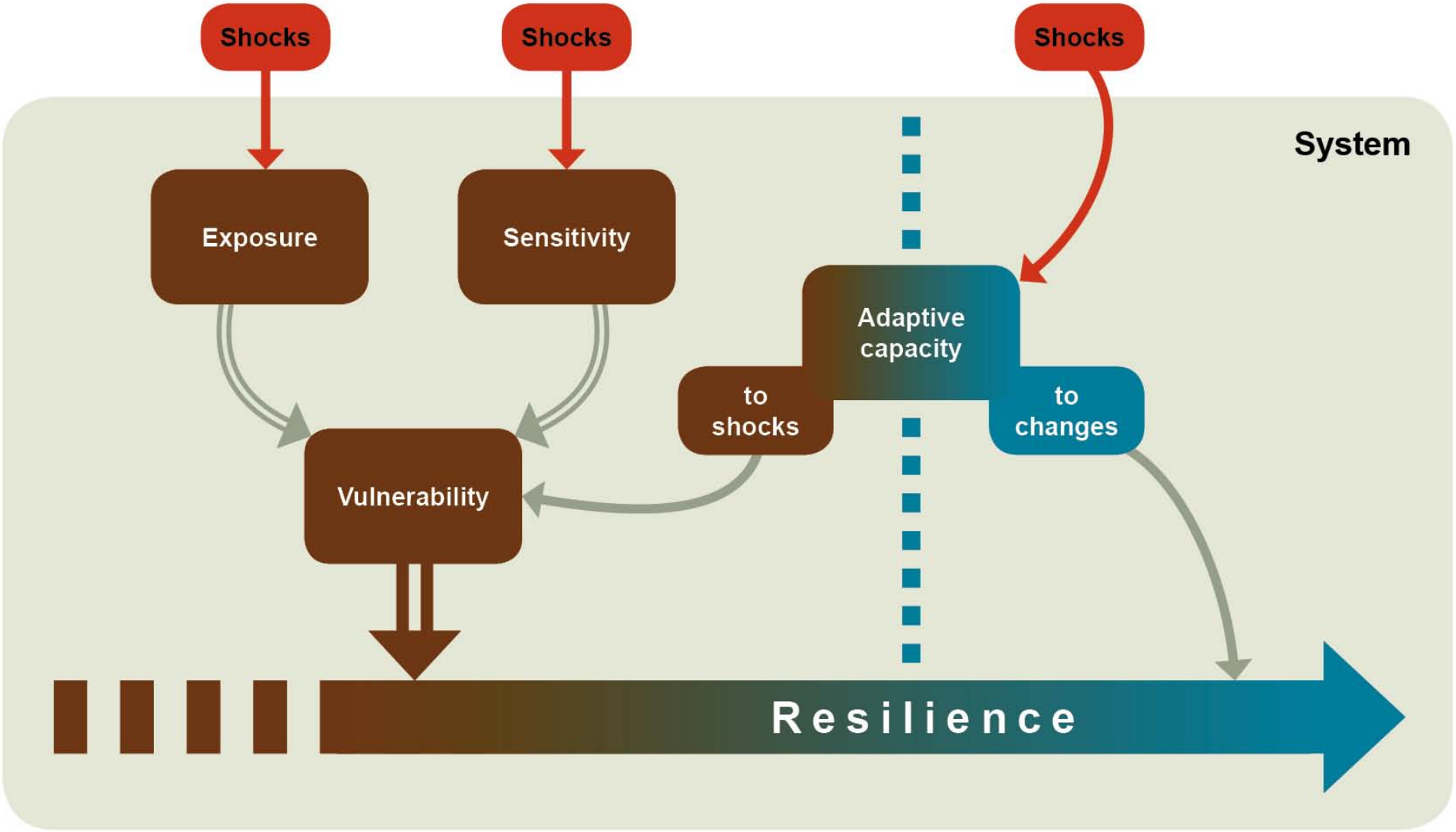


Vulnerability at scales
Compounding effects

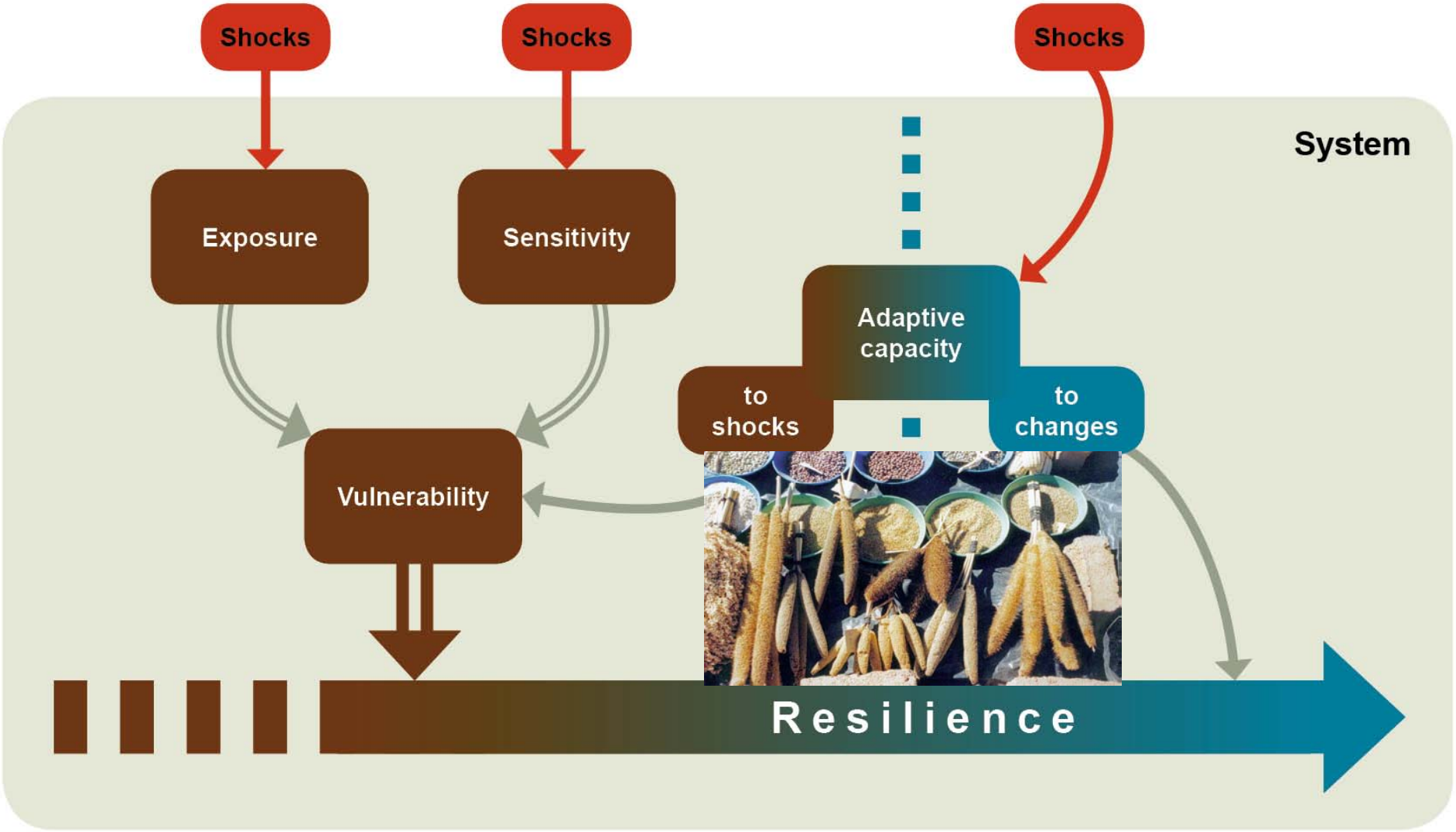
From one level to another, vulnerabilities can either :

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

Resilience


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

Resilience: seed systems increase adaptive capacity

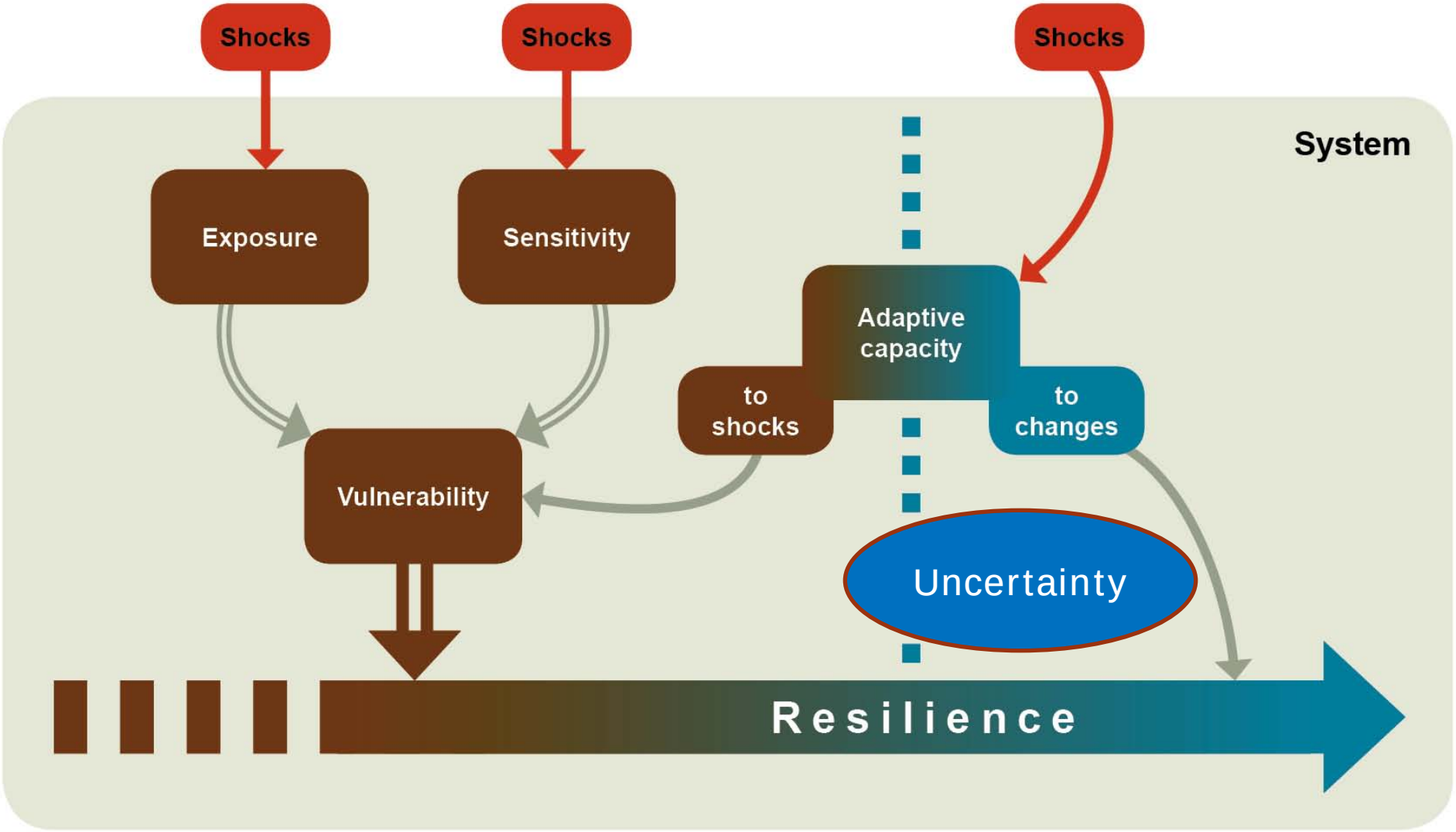


Building resilience: through time

- Build adaptive capacity not only to **existing risks** but also **to changes, in an evolving context.**
- Build adaptive capacity **at the same time as shocks occur**:
  - ex-ante
  - during the shock
  - ex-post

  strategies to build resilience

Resilience


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

Building adaptive capacity to changes: address uncertainty

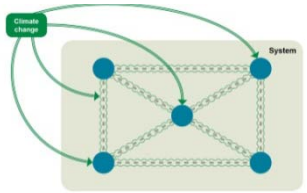
Diversification

Animal genetics

Genetic resources

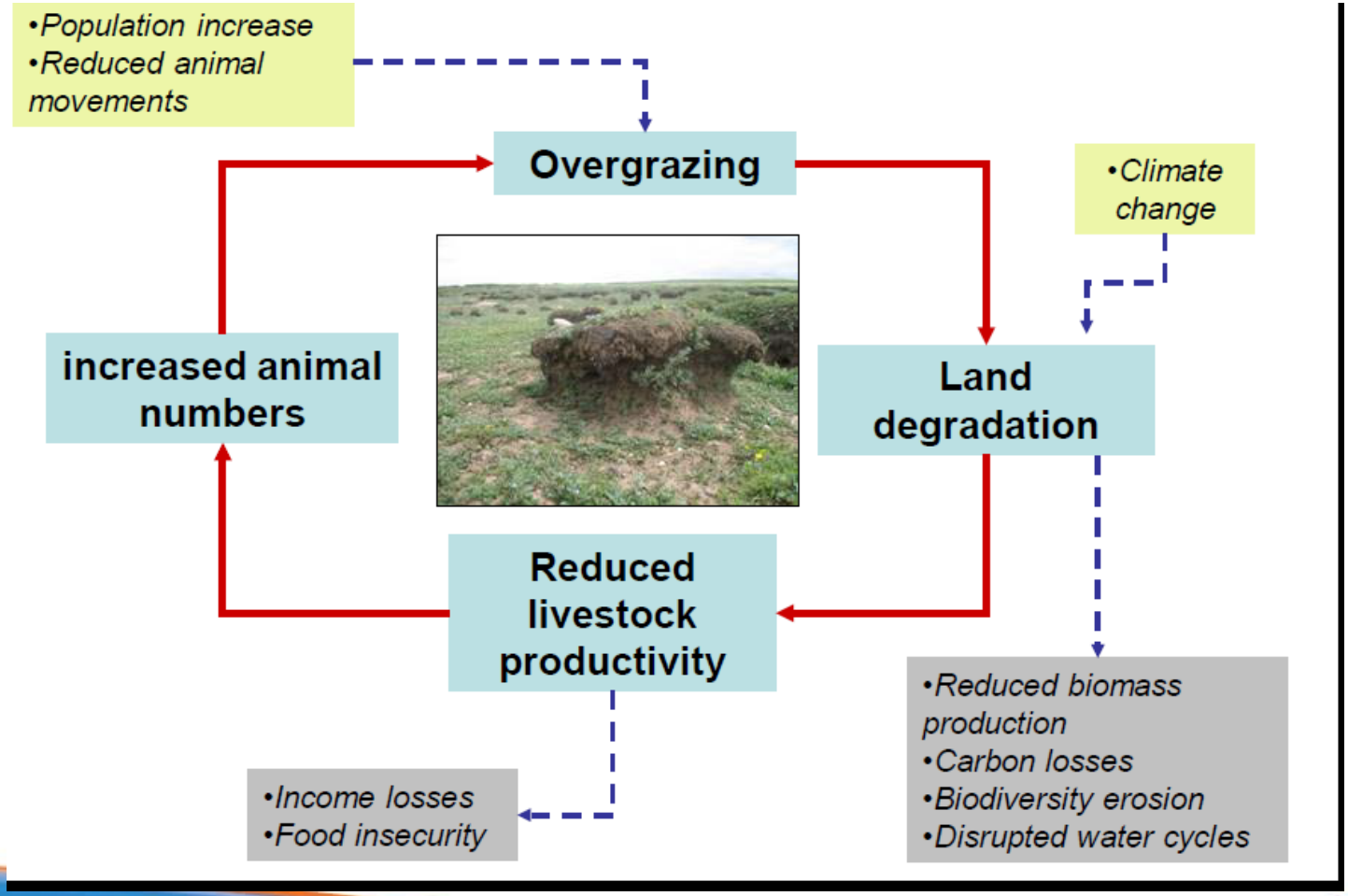
Comprehensive strategies to build resilience in a context of climate change

- Reduce, or take account of amplification effects between risks
- Organize compensation



➢ 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.

Degraded grazing systems



Three Rivers Project in Qinghai (China)

Household tailored measures to restore **grasslands**:

- Heavily degraded areas
- Moderately degraded grassland
- Lightly degraded grassland:
  - *Average de-stocking rate: 33%*

Improve **animal husbandry**

- Feeding
- Housing

Establish livestock product **market association**

Project benefits to farmers

Income benefits to herders

- higher value from livestock market (higher performance and better marketing)
- higher milk yield

Grassland rehabilitation

- controlled land degradation
- water cycles and biodiversity preserved

Even with less animals, herder can increase their income and improve the resilience of their grassland in the long run.

In Tuvalu, Pulaka is threatened by salinisation

Thank You

vincent.gitz@fao.org