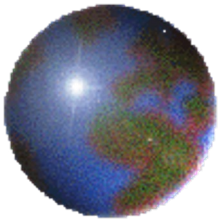

NAVIGATING THE COMPLEXITY ACROSS THE PEACE-SUSTAINABILITY-CLIMATE SECURITY NEXUS

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"Thus, the task is not so much to see what no one yet has seen, but to think what nobody yet has thought about that which everybody sees" (Arthur Schopenhauer).

A VUCA world

Volatile – Dynamic, fast-paced, perhaps unstable, but not necessarily hard to understand.

Uncertain – Cause and effect are known but key information is lacking; the outcome is uncertain.

Complex – Many interconnected processes and variables. Some information is available but the volume/nature of it can be overwhelming to process.

Ambiguous – Causal relationships are completely unclear. No precedents exist; "unknown unknowns."

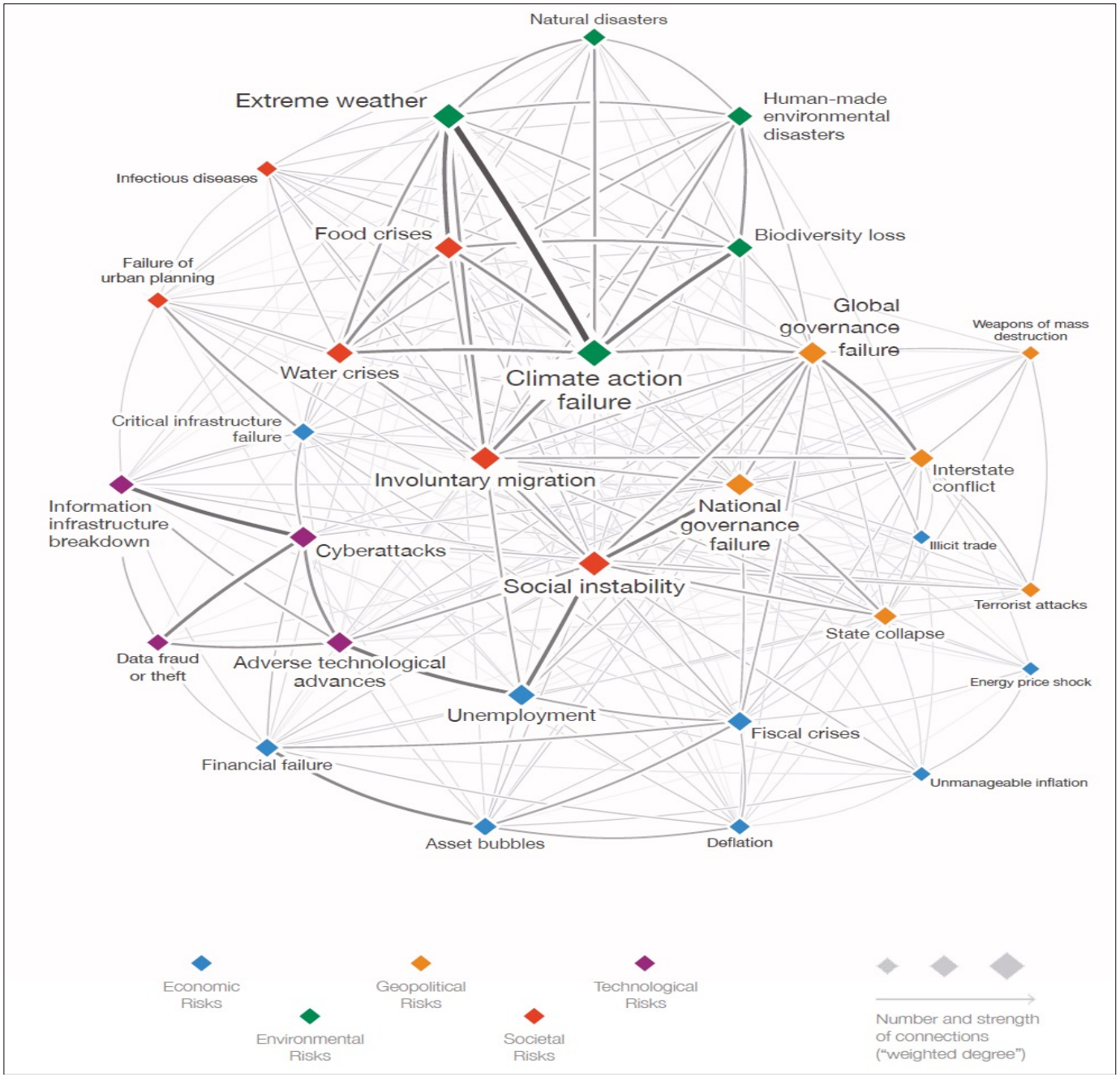
How can *all* humans have fulfilling lives, meet their basic needs, and live with dignity and at peace?

World Issues in the 21st Century

- Climate change and security risks
- Rapid urbanization;
- Population growth, migration, and resettlement;
- Water, energy, food, and land resources security;
- Access to education, shelter, healthcare, information and communication technology, and employment;
- Environmental damage and biodiversity loss;
- Natural and human-induced risks and emergencies;
- Peacebuilding and violent conflict prevention and recovery;
- Social equality and inclusive growth; and
- National and global security.

Short Term (2 years)	Long Term (10 years)
Cost-of-living crisis	Failure to mitigate climate change
Natural disasters and extreme weather events	Failure to mitigate climate adaptation
Geoeconomic confrontation	Natural disasters and extreme weather events
Failure to mitigate climate change	Biodiversity loss and ecosystem collapse
Erosion of social cohesion & societal polarization	Large-scale involuntary migration
Large-scale environmental damage incidents	Natural resource crises
Failure to mitigate climate adaptation	Erosion of social cohesion & societal polarization
Widespread cybercrime and cyber insecurity	Widespread cybercrime and cyber insecurity
Natural resource crises	Geoeconomic confrontation
Large-scale involuntary migration	Large-scale environmental damage incidents

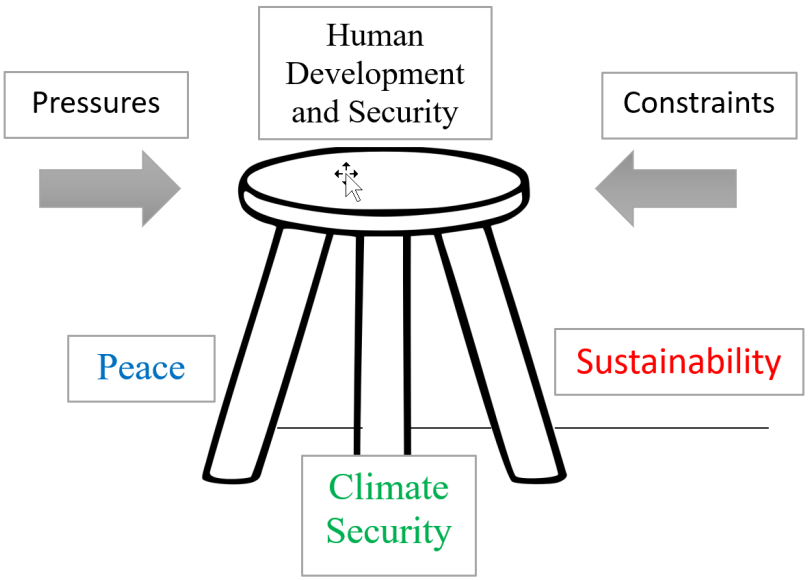
Top ten global risks ranked by severity. World Economic Forum (2023)


Natural disasters
Extreme weather
Human-made environmental disasters
Infectious diseases
Food crises
Biodiversity loss
Failure of urban planning
Global governance failure
Weapons of mass destruction
Water crises
Climate action failure
Critical infrastructure failure
Involuntary migration
Interstate conflict
Information infrastructure breakdown
National governance failure
Illicit trade
Cyberattacks
Social instability
Terrorist attacks
State collapse
Data fraud or theft
Adverse technological advances
Energy price shock
Unemployment
Fiscal crises
Financial failure
Unmanageable inflation
Asset bubbles
Deflation
Economic Risks
Geopolitical Risks
Technological Risks
Environmental Risks
Societal Risks
Number and strength of connections ("weighted degree")

WEF, 2020

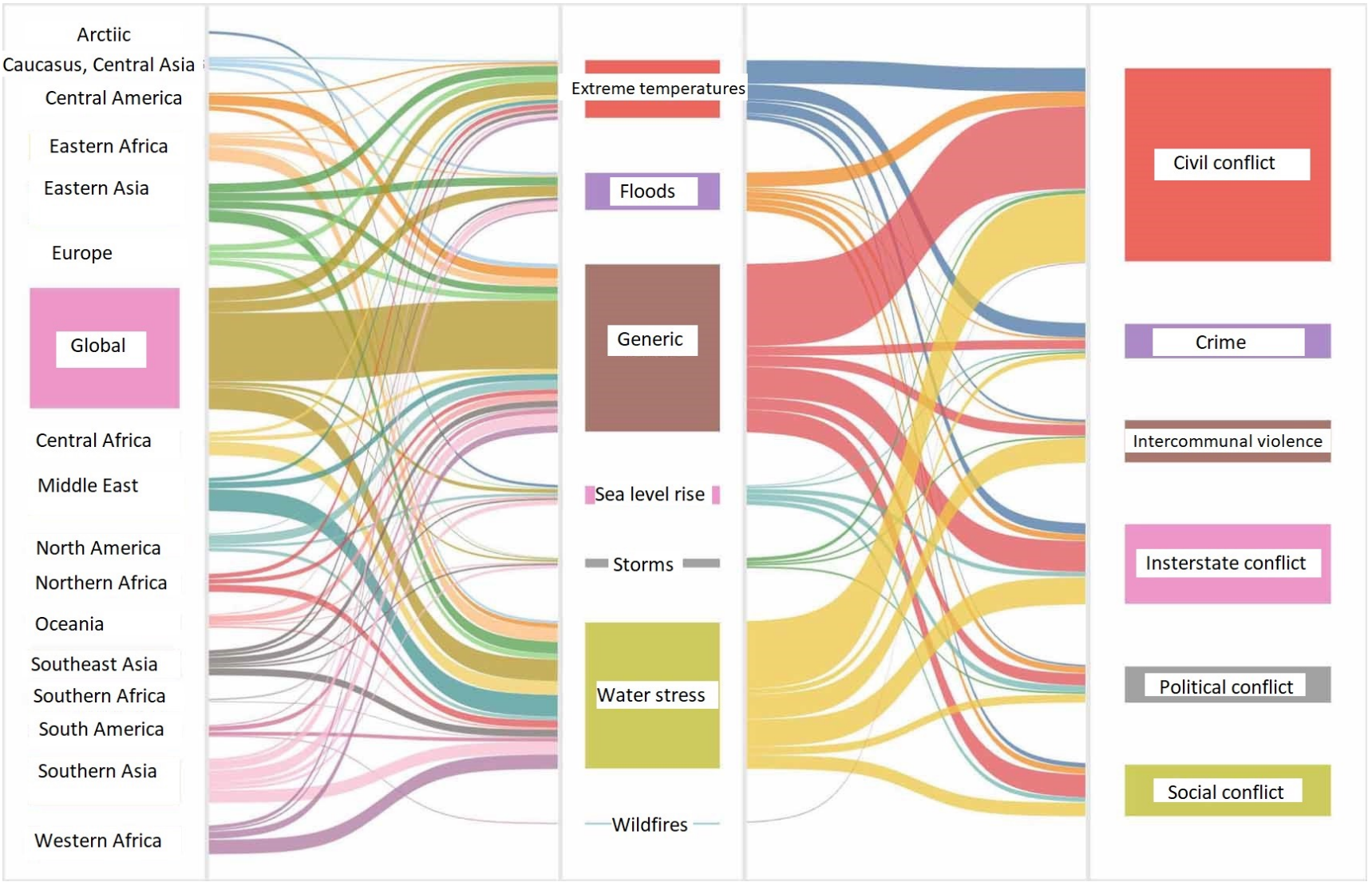

A
B
UM...
VIRPI/BUSINESSILLUSTRATOR.COM

Three interacting states



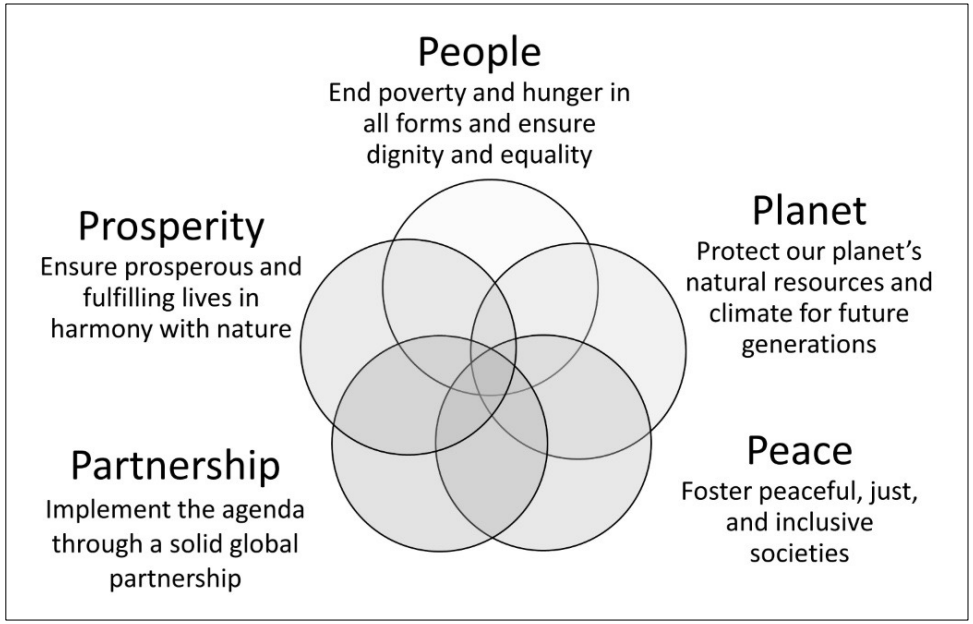
It is hard to envision:

- a sustainable community that is not peaceful and climate secured;
- a peaceful community that has not endorsed sustainable practices and does not support climate adaption and mitigation; and
- a climate-secured community that has not endorsed sustainable practices and is geopolitically unstable.



Pathways between climate stressors and conflict type by region (Sharifi et al., 2021).

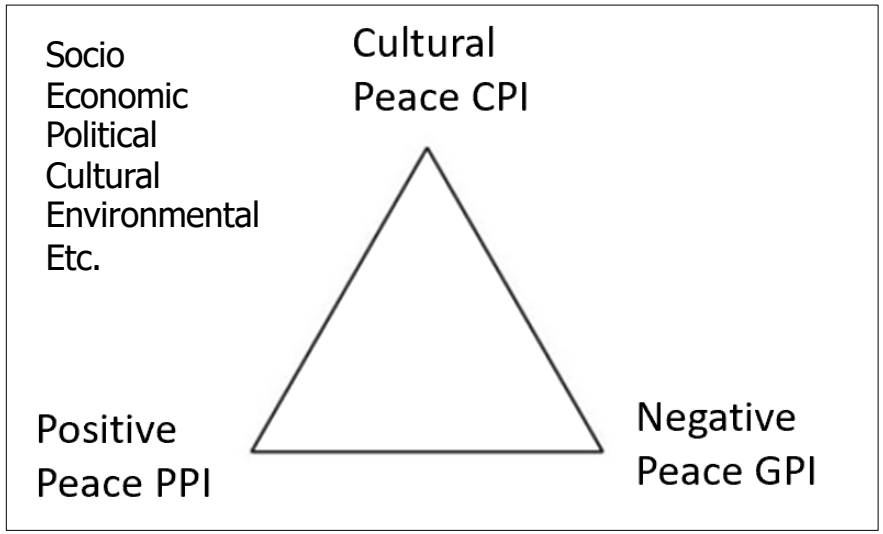
Sustainability



"A **dynamic equilibrium** in the processes of interaction between a population and the carrying capacity of an environment such that the population develops to express its full potential without adversely and irreversibly affecting the carrying capacity of the environment upon which it depends. "

(Ben-Eli, 2018)

Peace



J. Galtung

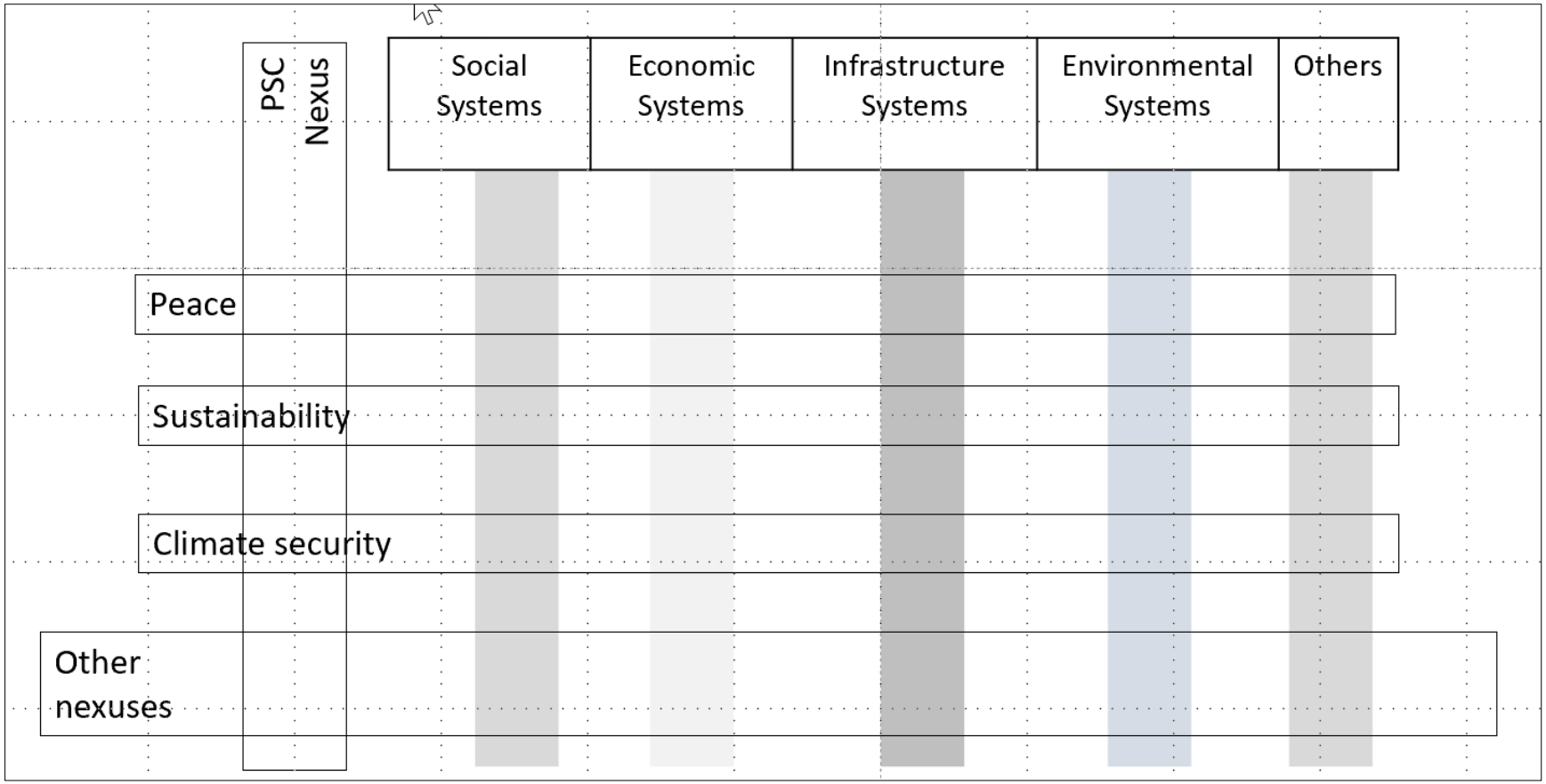
"An enabling violent-free state of **dynamic equilibrium** emerging from the right relationships among different populations and their interaction with the various systems in the landscape upon which they depend."

Climate security

- "The security to risks induced, directly or indirectly, by changes in climate patterns" (Wikipedia).
- Awareness, adaptation, mitigation

- "A secure and resilient **state of dynamic equilibrium** emerging from the right interactions between populations and the systems they depend on, and where proper practices are used to help prevent, reduce, mitigate, cope, or adapt to the risks and threats related directly and indirectly to the impacts of climate change and related environmental degradation, as well as subsequent policies."

Silo approach vs. systems approach to peace-sustainability-climate security



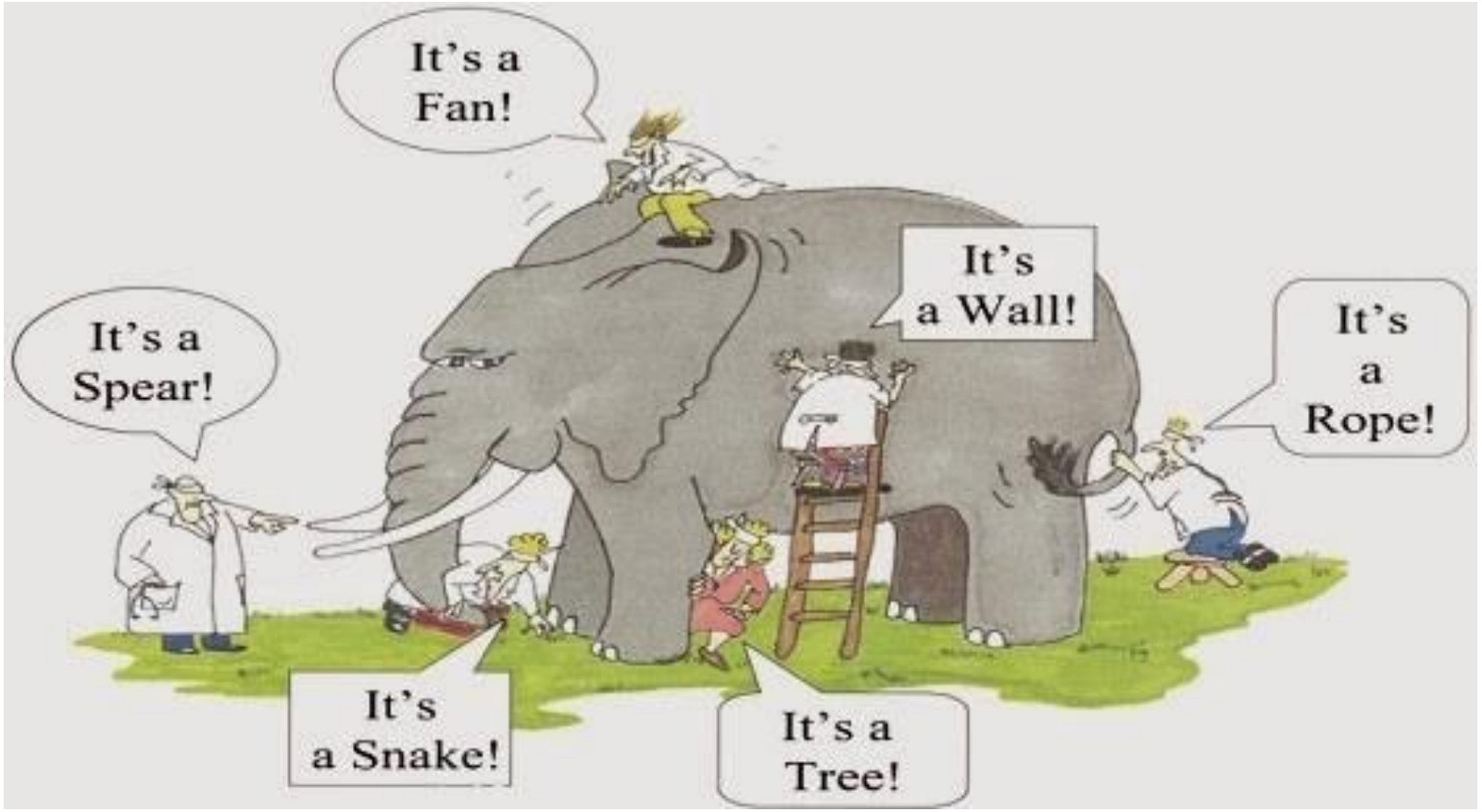
Nexus

"That which ties or processes linking things together"

Double, triple, and quadruple nexuses:

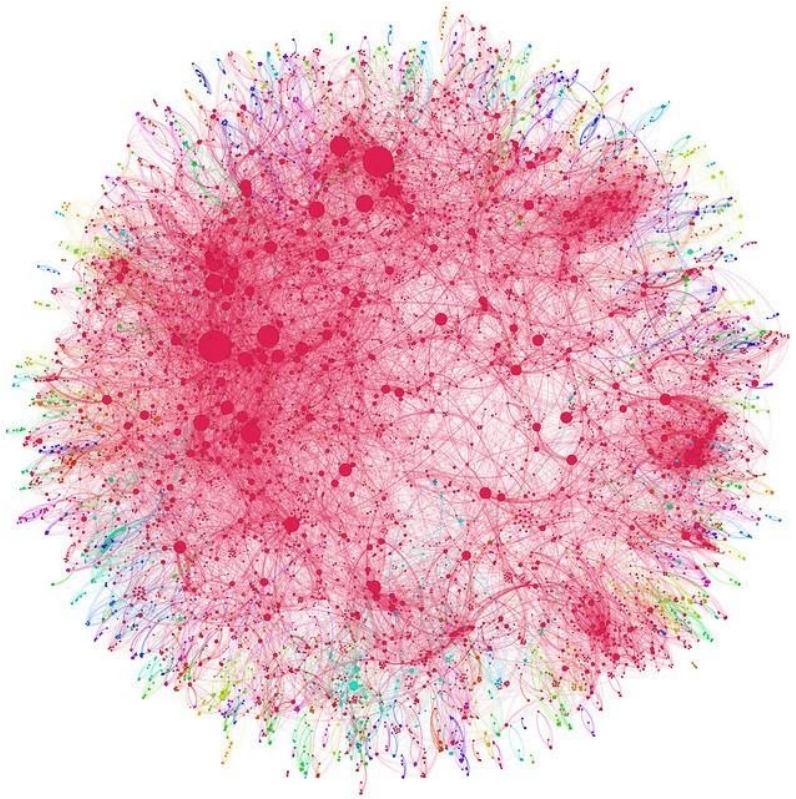
- Water-Energy-Land-Food nexus
- the Humanitarian Aid-Development-Peace nexus;
- the Food-Nutrition security nexus;
- the Food-Health-Care-Nutrition nexus;
- the Climate-Fragility-Peace nexus
- The Peace-Sustainability-Climate security nexus…

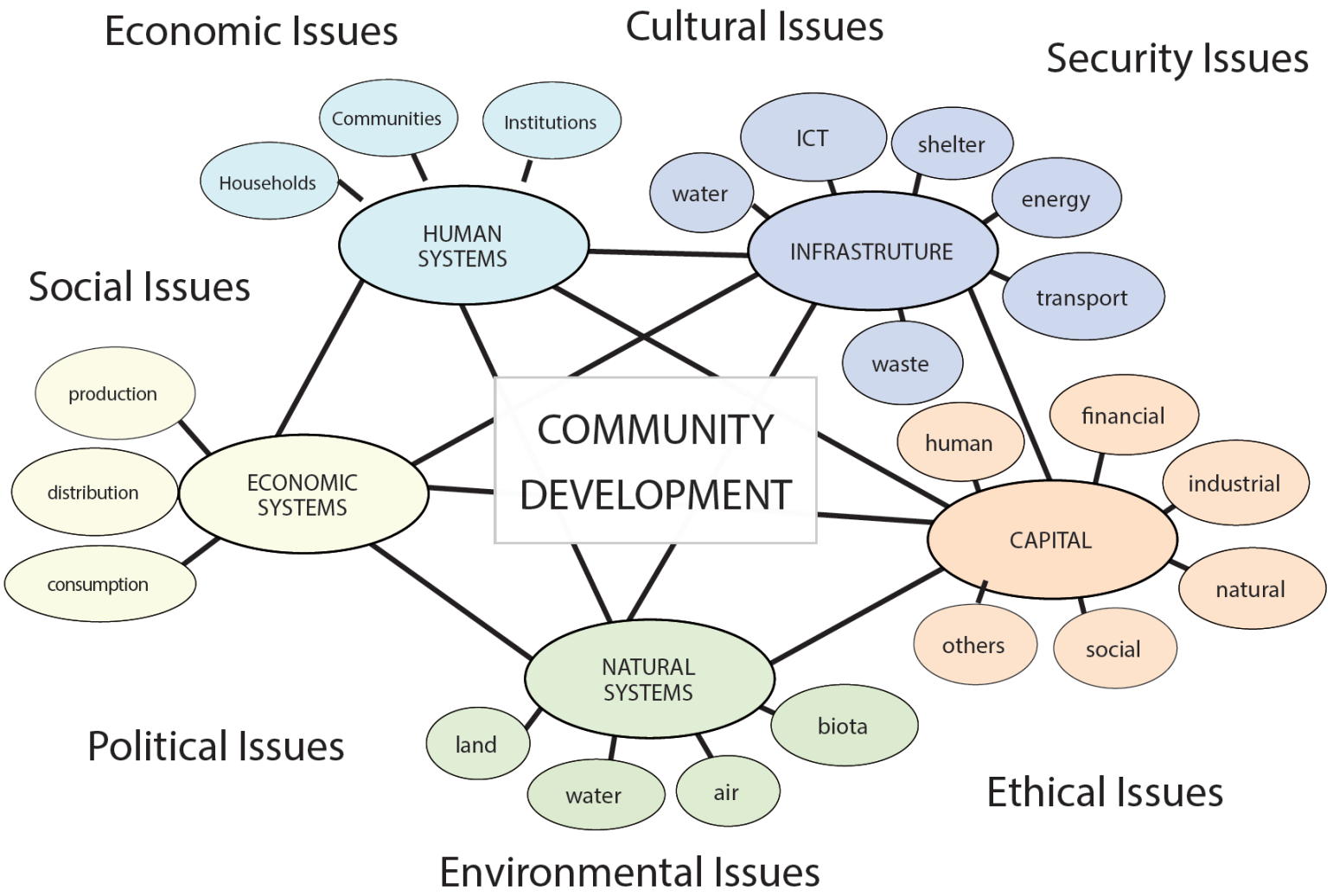
Dealing with complexity: Six blind people and an elephant

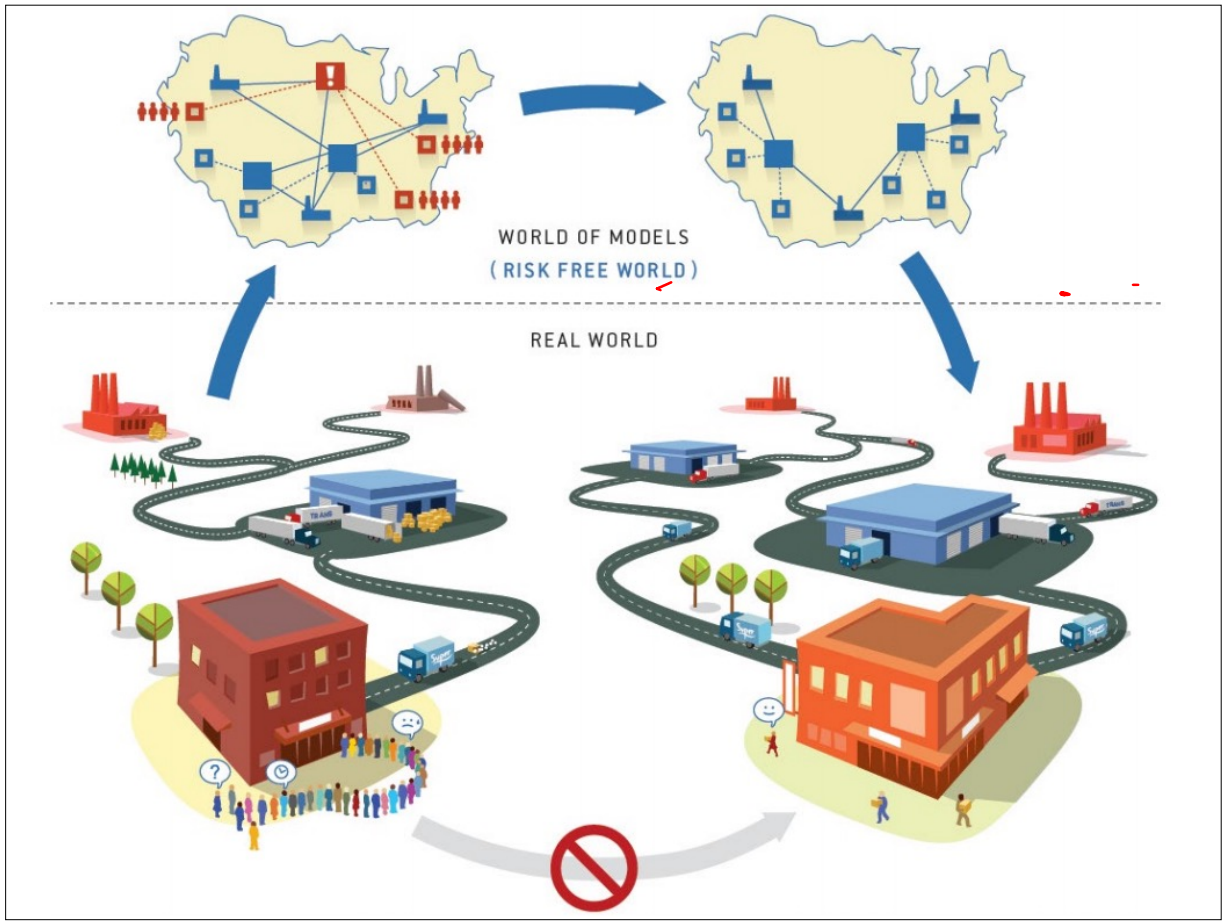


A systems approach to the nexus requires

- Adopting a systems mindset
- Acquiring systems thinking habits
- Using systems tools (hard and soft)




Economic Issues
Cultural Issues
Security Issues
Communities
Institutions
Households
HUMAN SYSTEMS
ICT
shelter
water
energy
INFRASTRUTURE
transport
waste
Social Issues
production
distribution
consumption
ECONOMIC SYSTEMS
COMMUNITY DEVELOPMENT
human
financial
industrial
CAPITAL
natural
others
social
NATURAL SYSTEMS
land
biota
water
air
Political Issues
Ethical Issues
Environmental Issues



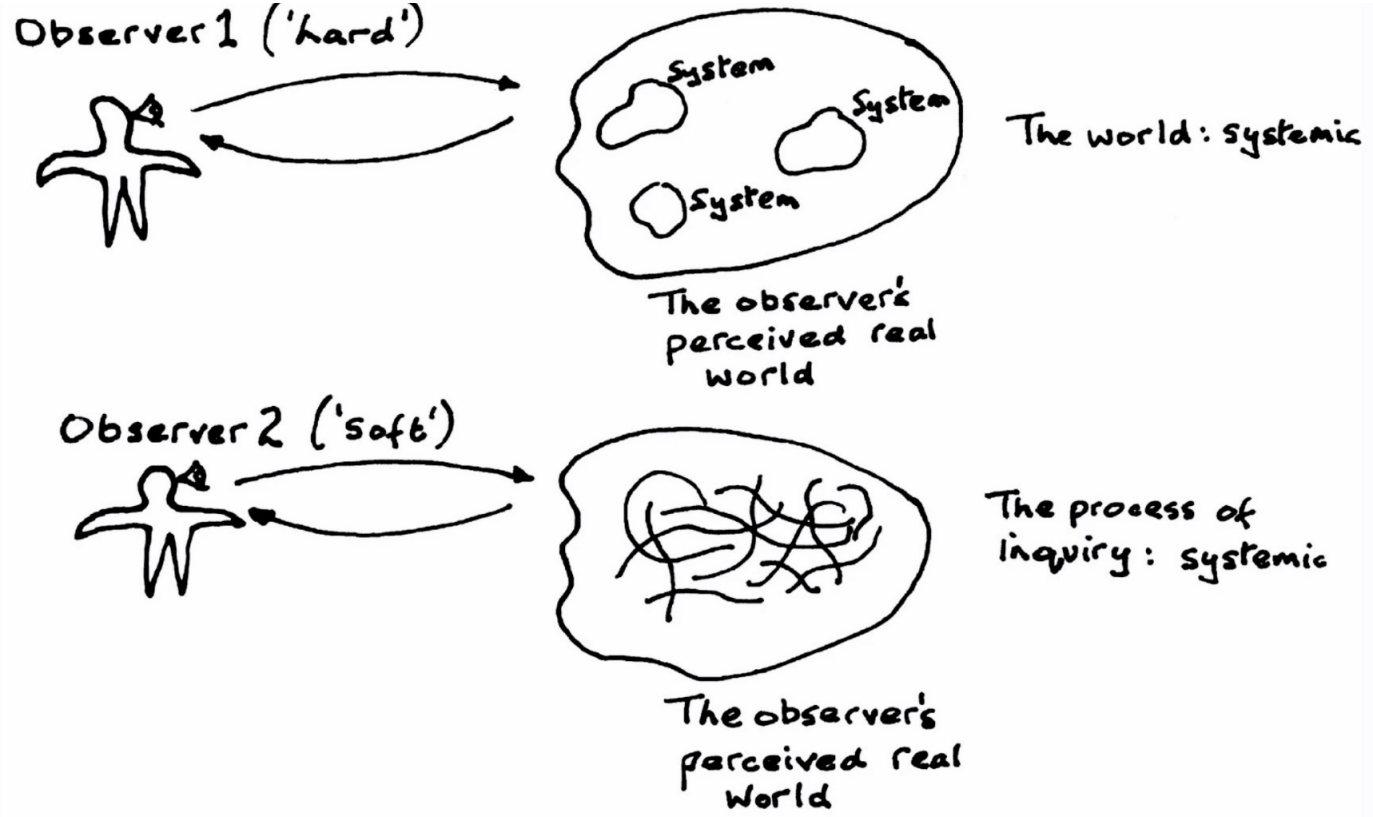
Borshchev, A. (2013). *The big book of simulation modeling*

A soft system perspective

A hard system perspective

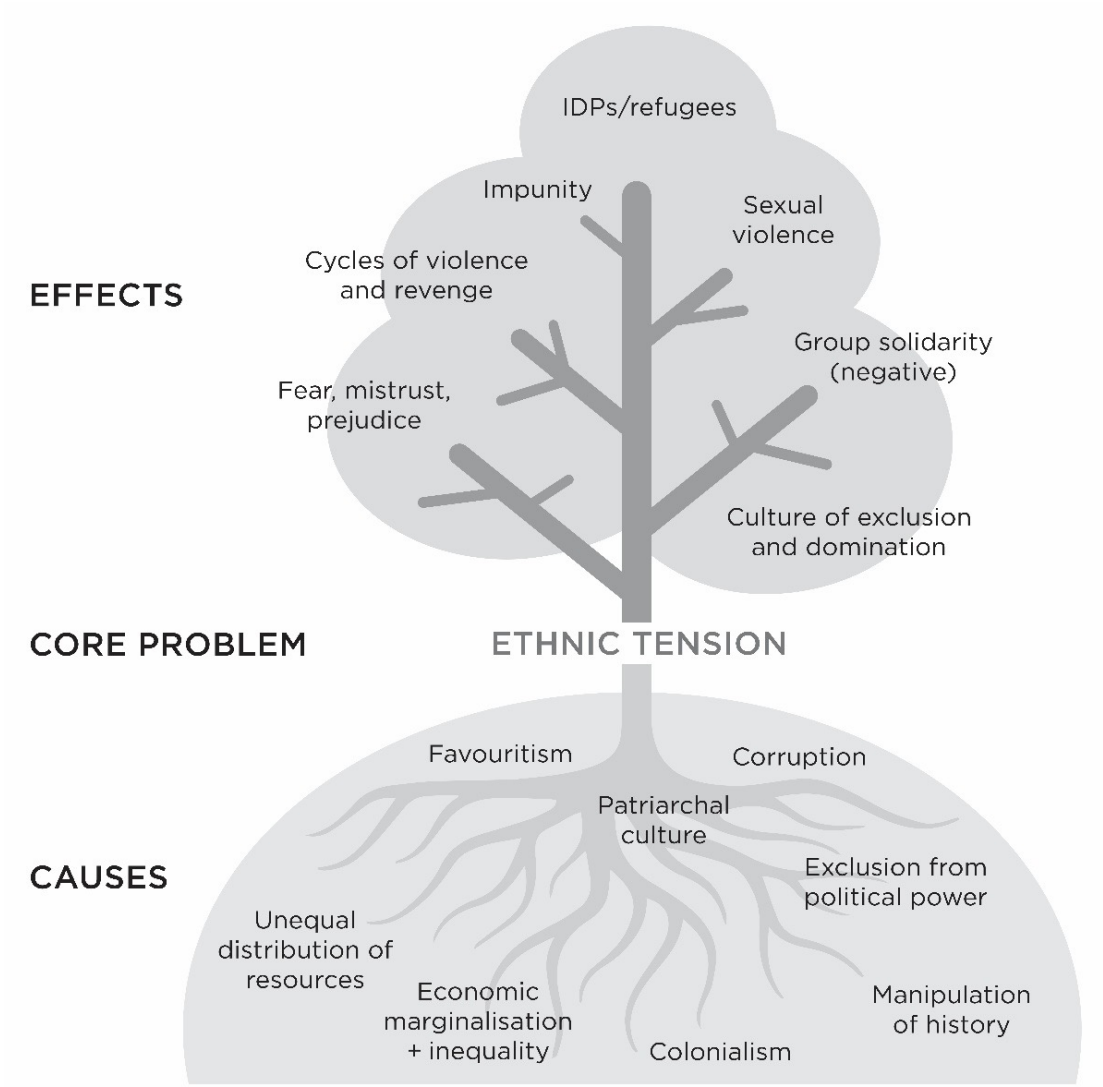
Checkland and Poulter (2006)

"Essentially all models are wrong, but some are useful" and "the approximate nature of the model must always be borne in mind" (Box and Draper, 1987).

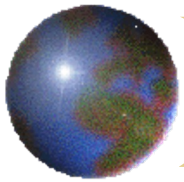


Observer 1 'I spy systems which I can engineer.'

Observer 2 'I spy complexity and confusion; but I can organize exploration of it as a learning system.'



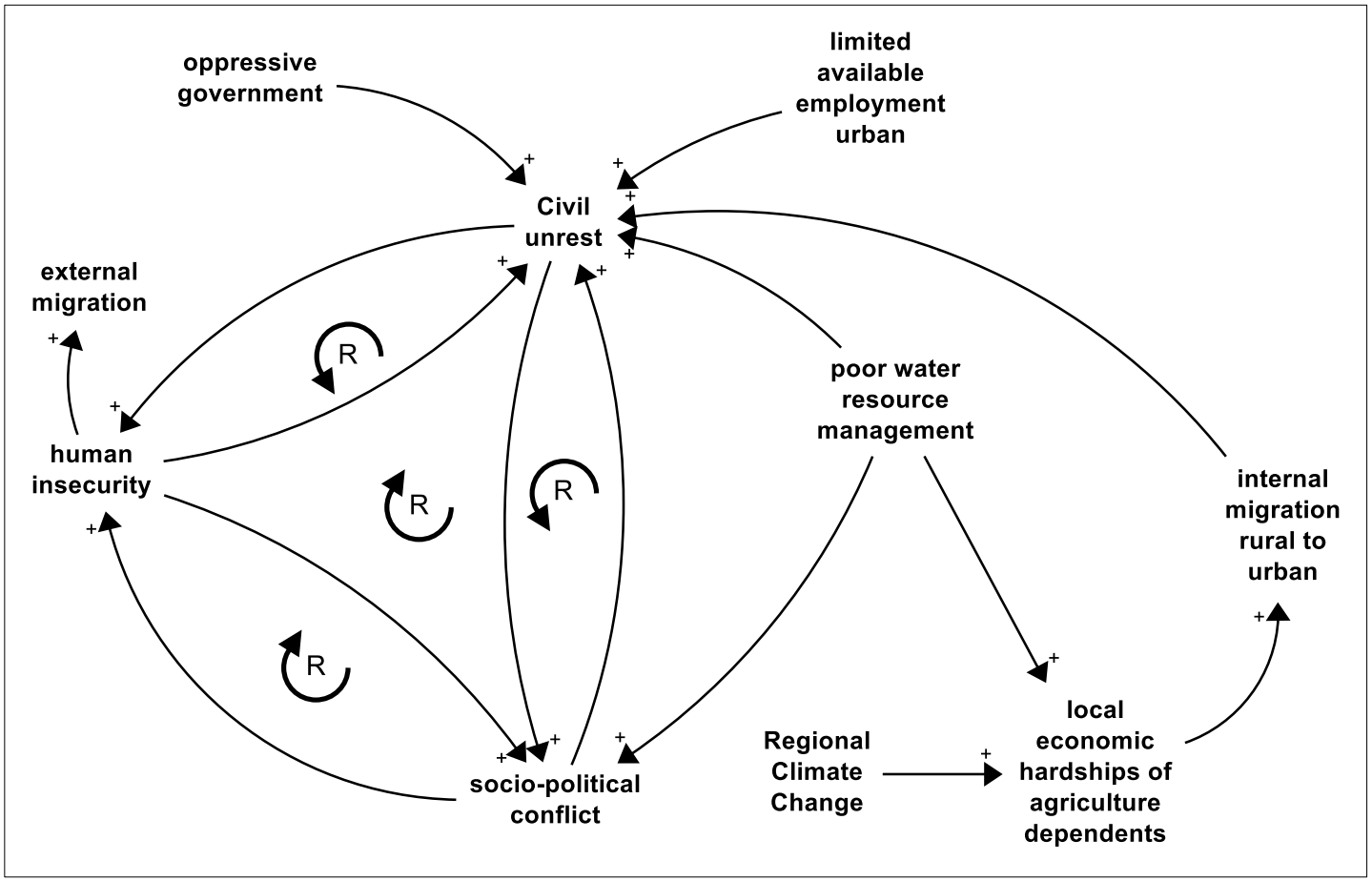
Problem vs solution trees – CDA Collaborative 2012

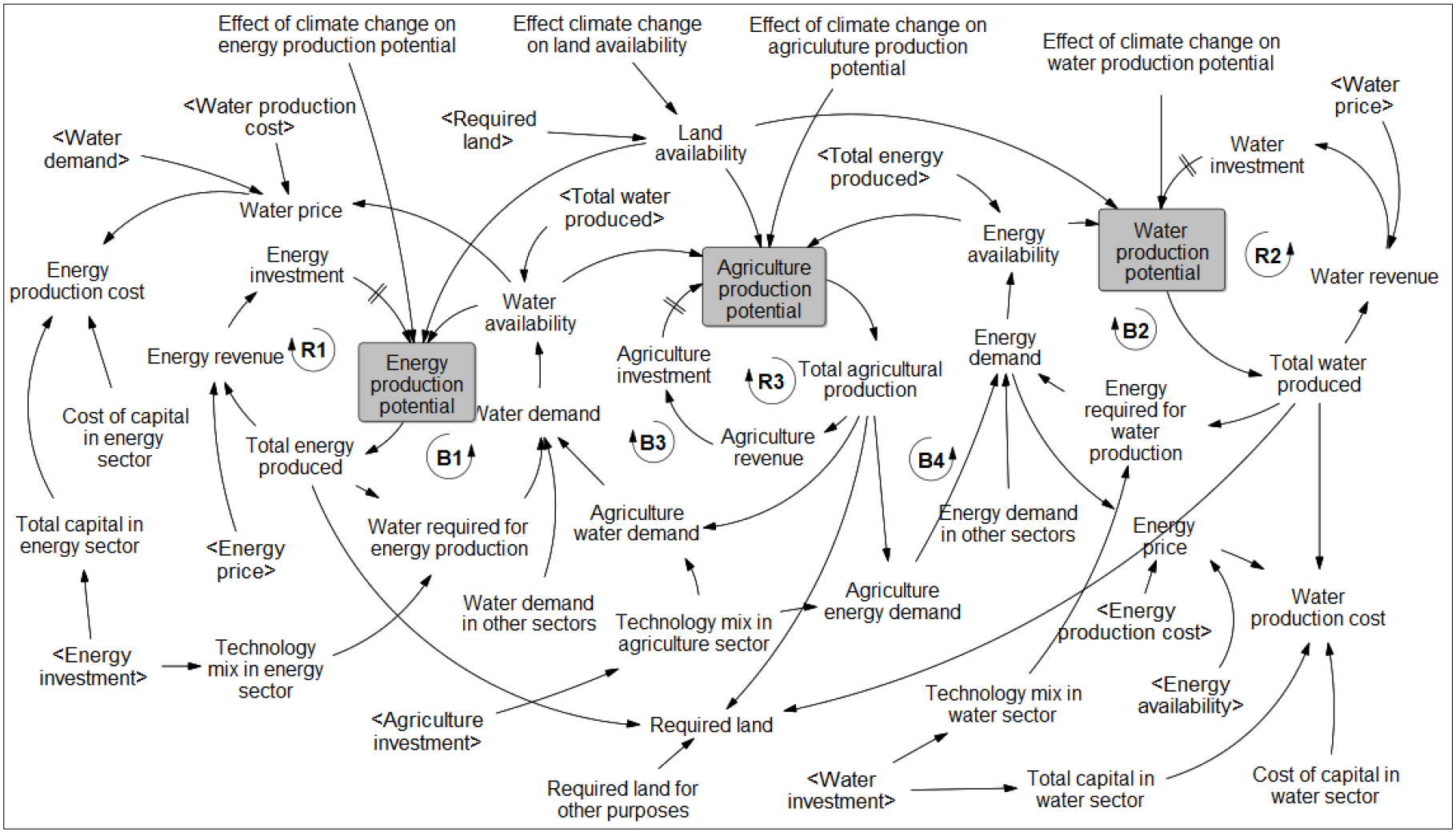


System Dynamics

- Captures both qualitatively and quantitatively how systems continuously change over time due to possible changes in and relationships among components and changes in the overall direction of systems;
- Accounts for systems non-linearities, feedback mechanisms, and delays
- Illustrates that as the structure of a system changes, so does its behavior and vice-versa.

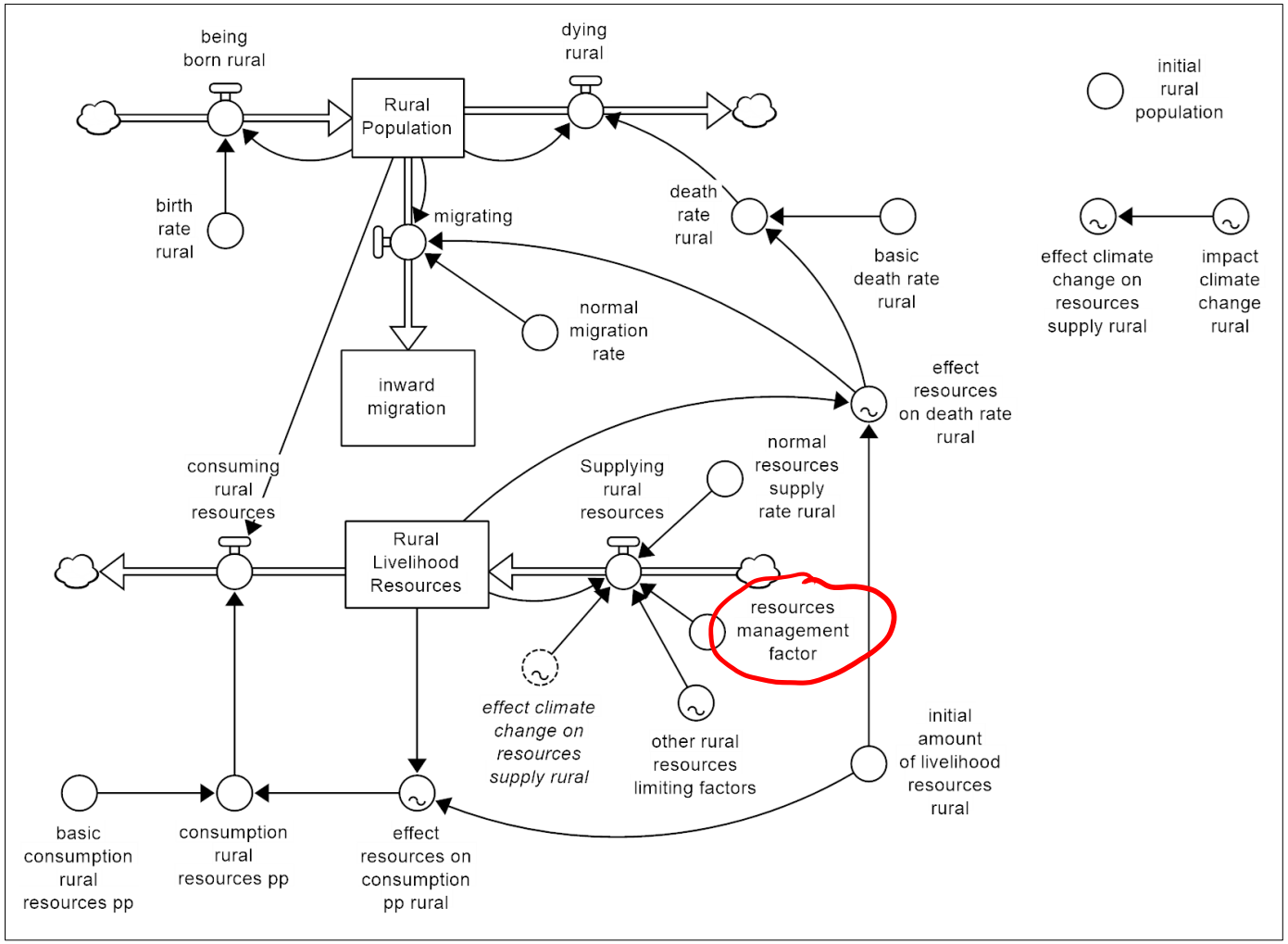
Syrian Conflict 2010-Present

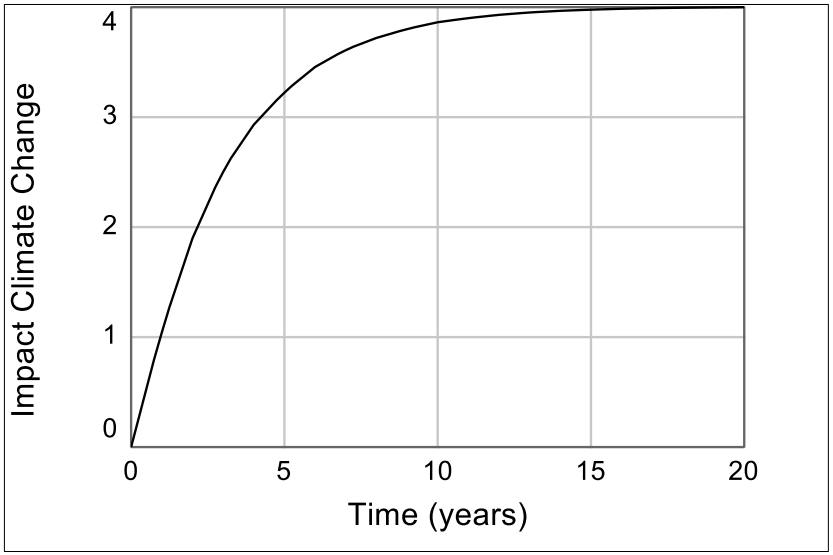


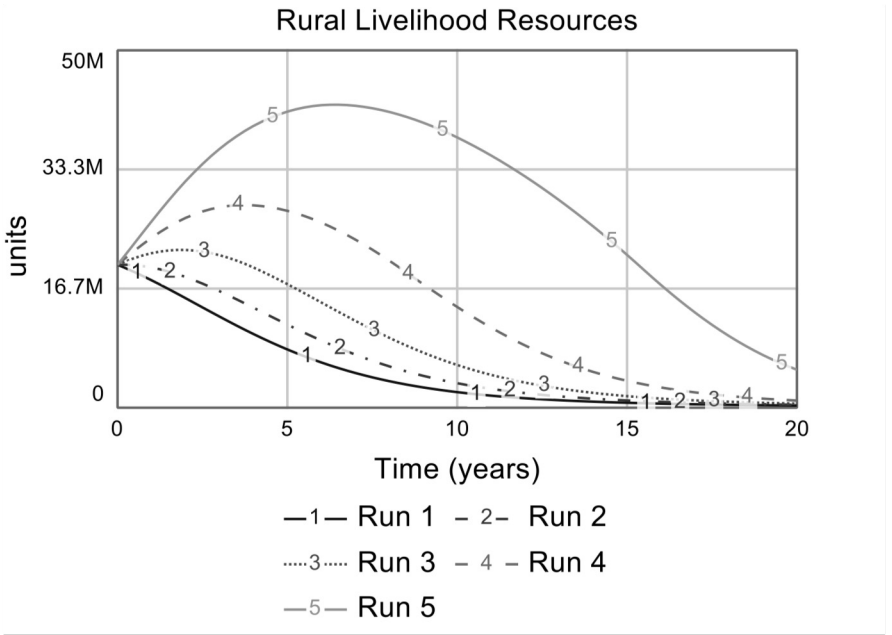


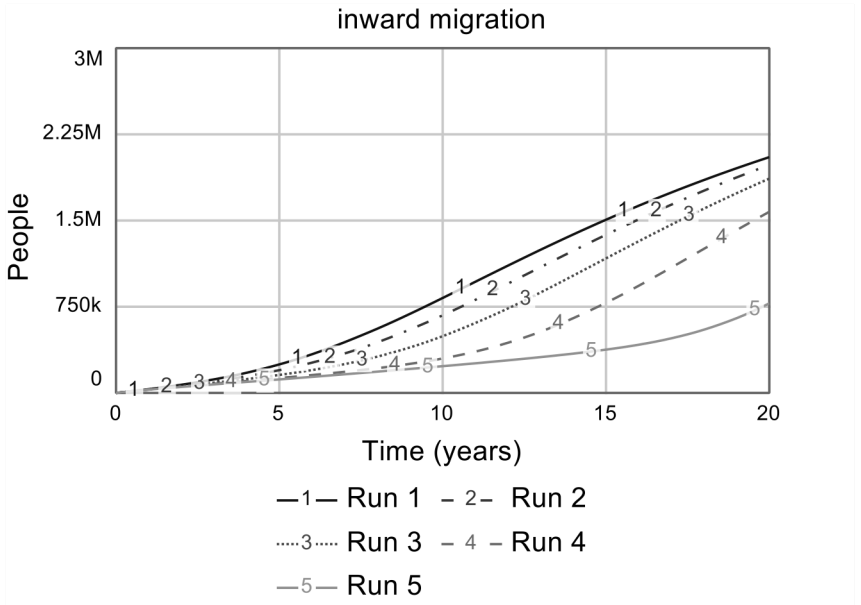
From Sohofi et al., 2016

Modeling Migration within Syria





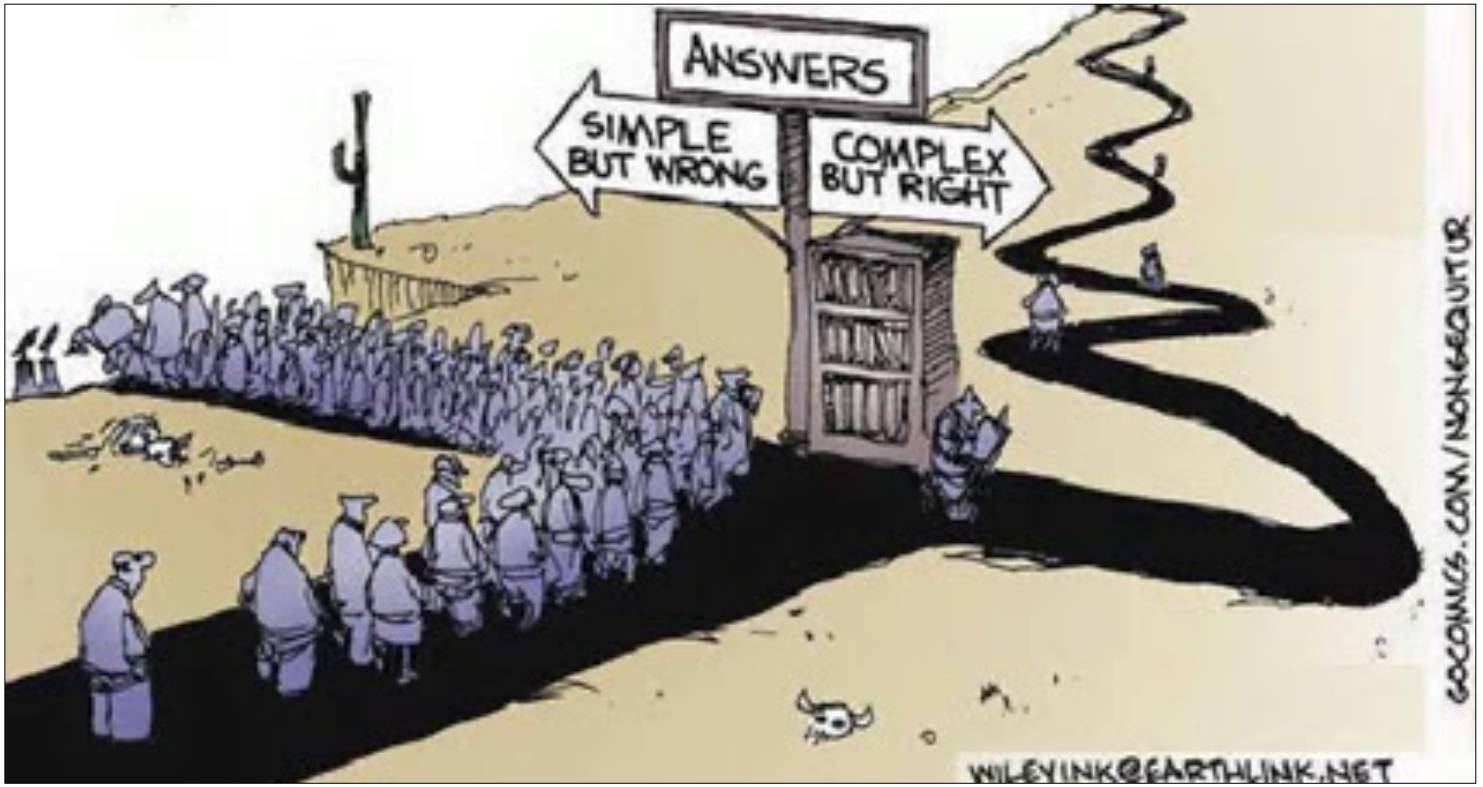




Effect of resource management on rural livelihood resources and inward migration

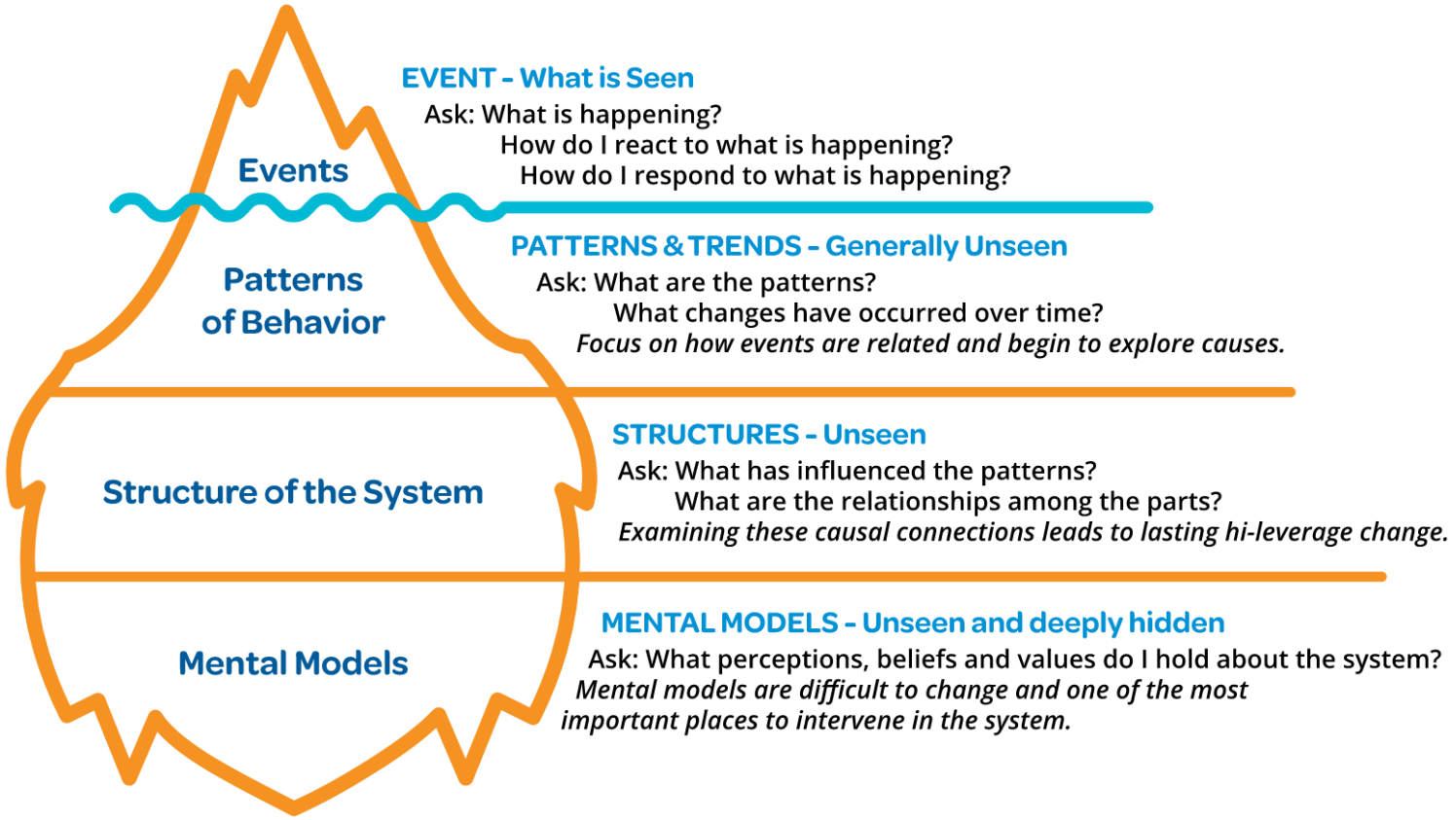
Practical Systemic Questions

- Nexus sectors interactions at different physical and temporal scales?
- Factors supporting or impeding community resilience to adverse events and crises?
- Appropriate indicators and performance metrics?
- Criteria/measures to make appropriate decisions when intervening in different sectors?
- Qualitative/quantitative data to best capture the two- or three-way interactions between nexus components and the various community systems with which the nexus interacts?
- Nexus databases needed?
- Context and scale in modeling the nexus and making decisions about interventions across the nexus?
- Balancing objective (rational) and subjective (intuitive) decision-making when deciding on interventions across the nexus?
- Defining success in integrating the nexus sectors at the community level (synergies and tradeoffs)?



"For every complex problem, there is an answer that is clear, simple, and wrong."
(H.L. Mencken, n.d.)

Changing the mindset



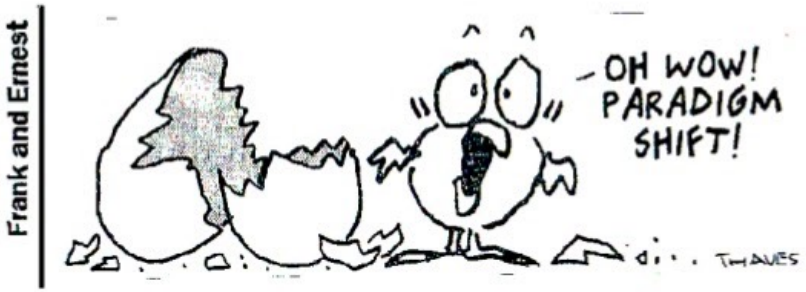
Tools of Systems Thinking Courses - Thinking Tools Studio (waterscenterst.org)

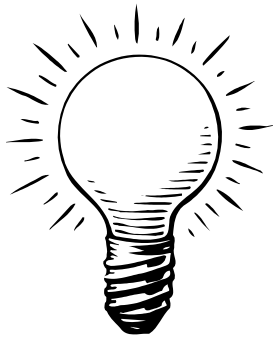
What is a *Paradigm Shift?*

OFX. Academy

"The significant problems we face today cannot be solved at the same level of thinking we were at when we created them."

Albert Einstein





Contact: amadei@colorado.edu

"A new 'uncertainty complex' is emerging, never before seen in human history. Constituting it are three volatile and interacting strands: the destabilizing planetary pressures and inequalities of the Anthropocene, the pursuit of sweeping societal transformations to ease those pressures and the widespread and intensifying polarization."

2021/2022 Human Development Report