

Climate Change 2014. Human Security, Water and Food Security

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Content

- 1. Some concepts of WG II**
- 2. Threats to water security**
- 3. Risks to food security**
- 4. Challenges to human security**
- 5. Adaptation and resilience building from bottom-up and top down**



1. Some concepts

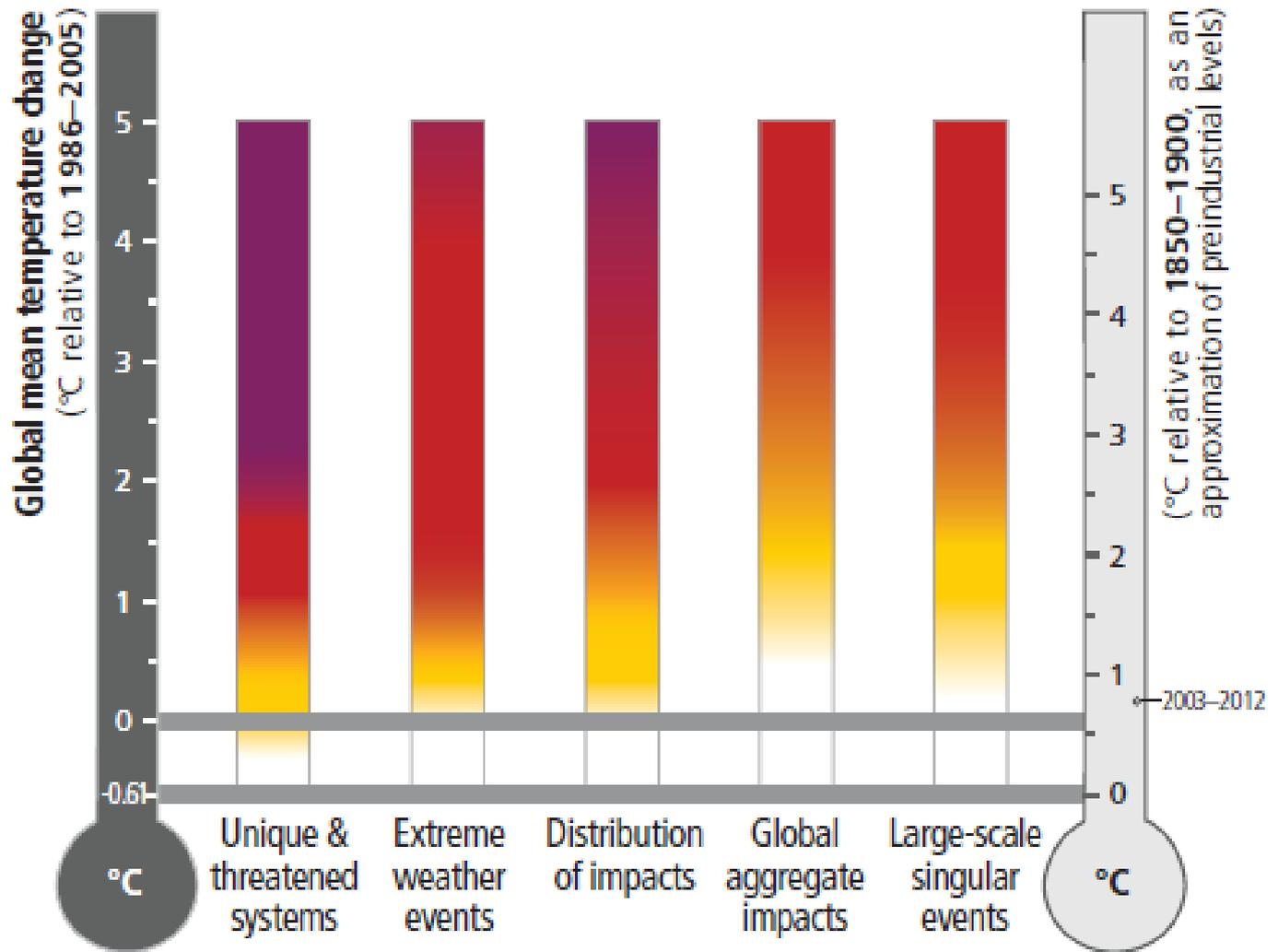
Climate change, hazard, exposure

- **Climate change:** a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods. Climate change is attributable to human activities altering the atmospheric composition, and climate variability attributable to natural causes.
- **Hazard:** The potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems, and environmental resources.
- **Exposure:** The presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected.

Vulnerability, impacts and risks

- **Vulnerability:** The propensity or predisposition to be adversely affected, including sensitivity or susceptibility to harm and lack of capacity to cope and adapt.
- **Impacts:** Effects on natural and human systems (effects on lives, livelihoods, health, ecosystems, economies, societies, cultures, services, and infrastructure due to hazardous climate events occurring within a specific time period and the vulnerability of an exposed society or system.
- **Risk** results from the interaction of vulnerability, exposure, and hazard of climate-change impacts.

Risks



Level of additional risk due to climate change

Undetectable

Moderate

High

Very high

Adaptation and resilience

- **Adaptation:** The process of adjustment to actual or expected climate and its effects, to moderate or avoid harm or exploit beneficial opportunities.
- **Resilience:** The capacity of social, economic, and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity, and structure, while also maintaining the capacity for adaptation, learning, and transformation.

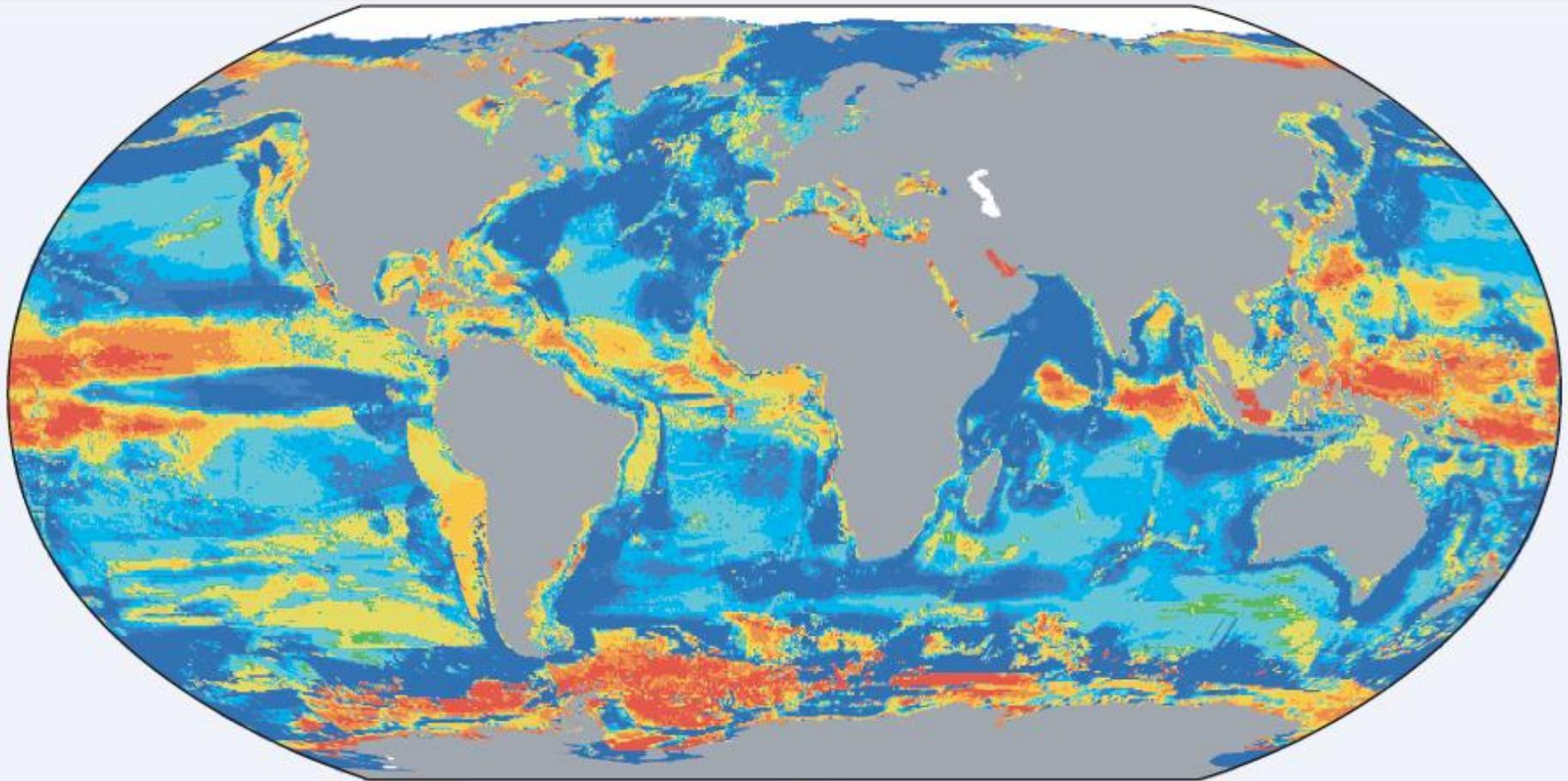
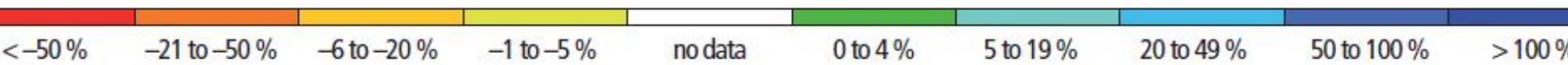
2. Threats to water security



Water security

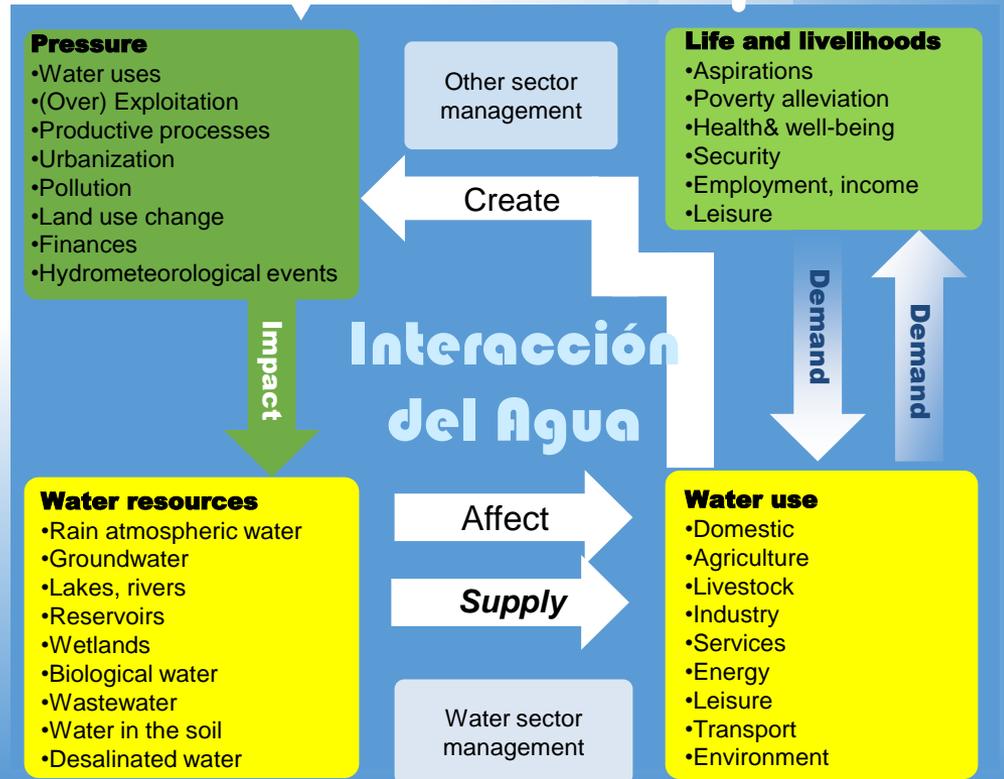
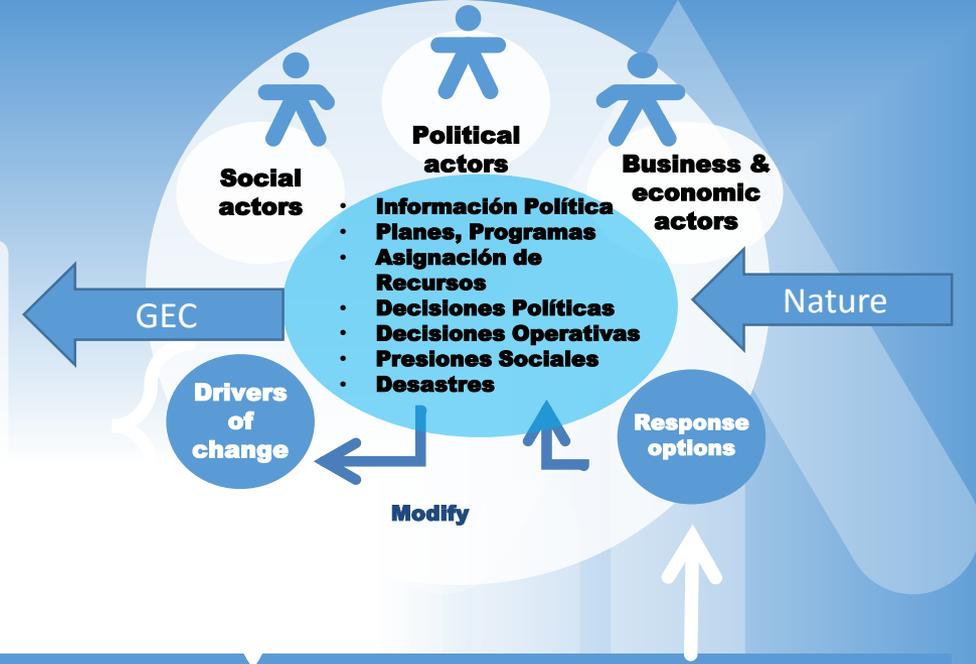
- In many regions, changing precipitation or melting snow and ice are altering hydrological systems, affecting water resources in terms of quantity and quality.
- Many terrestrial, freshwater, and marine species have shifted their geographic ranges, seasonal activities, migration patterns, abundances, and species interactions in response to ongoing climate change.
- At present the worldwide burden of human ill-health from climate change is relatively small compared with effects of other stressors and is not well quantified. However, there has been increased heat-related mortality and decreased cold-related mortality in some regions as a result of warming. Local changes in temperature and rainfall have altered the distribution of some waterborne illnesses and disease vectors.

Catch potential (2051-2060 compared 2001-2010)



Integrated water management

- CEG: Global Environmental Change:**
- Demographic
 - Urbanization
 - Food
 - Social organization
 - Economy and finance
 - Policy & law
 - Technology
 - Environment
 - Hydrometeorological events



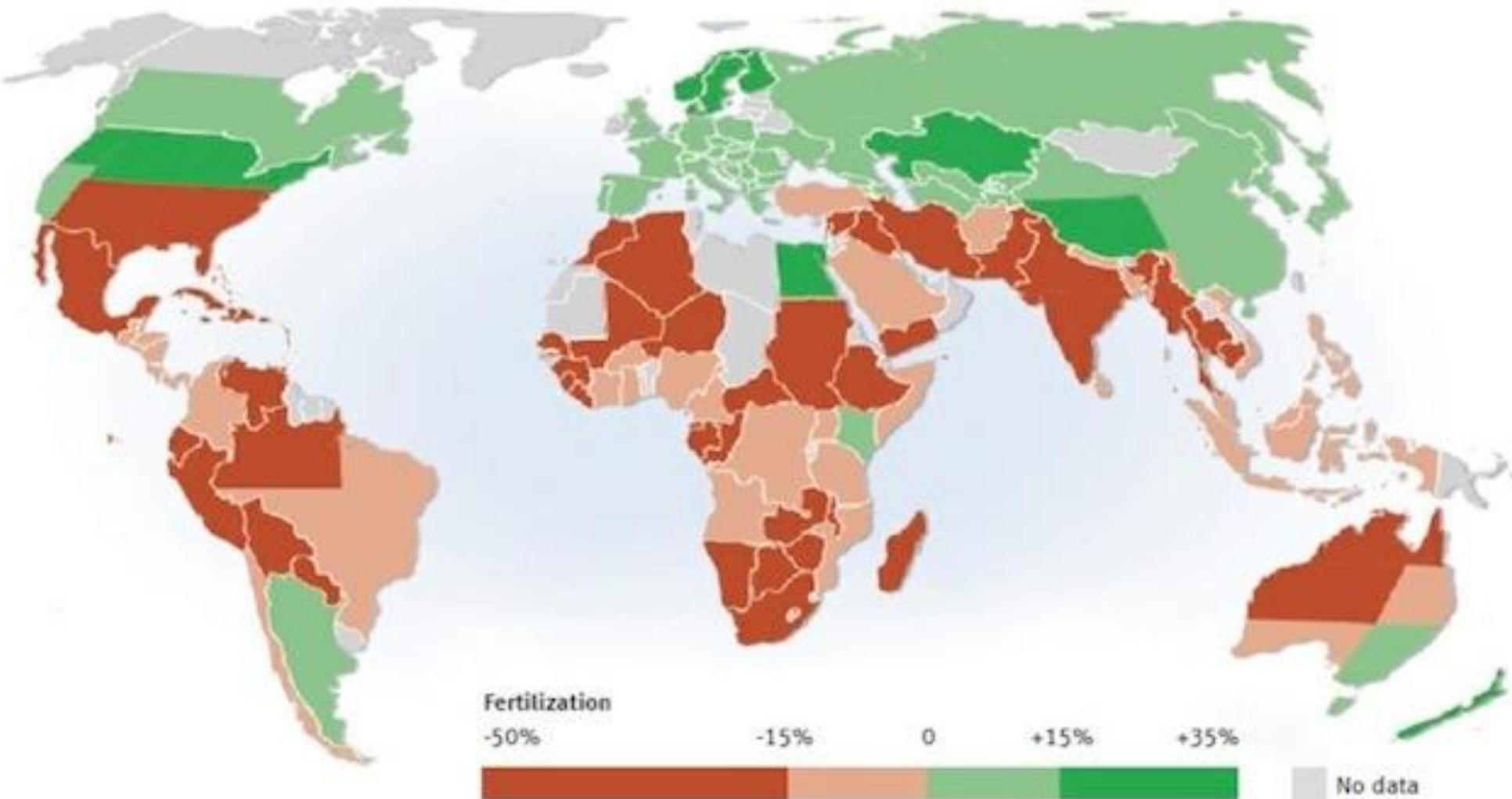
Sources: based on Global Water News, #9, p. 4



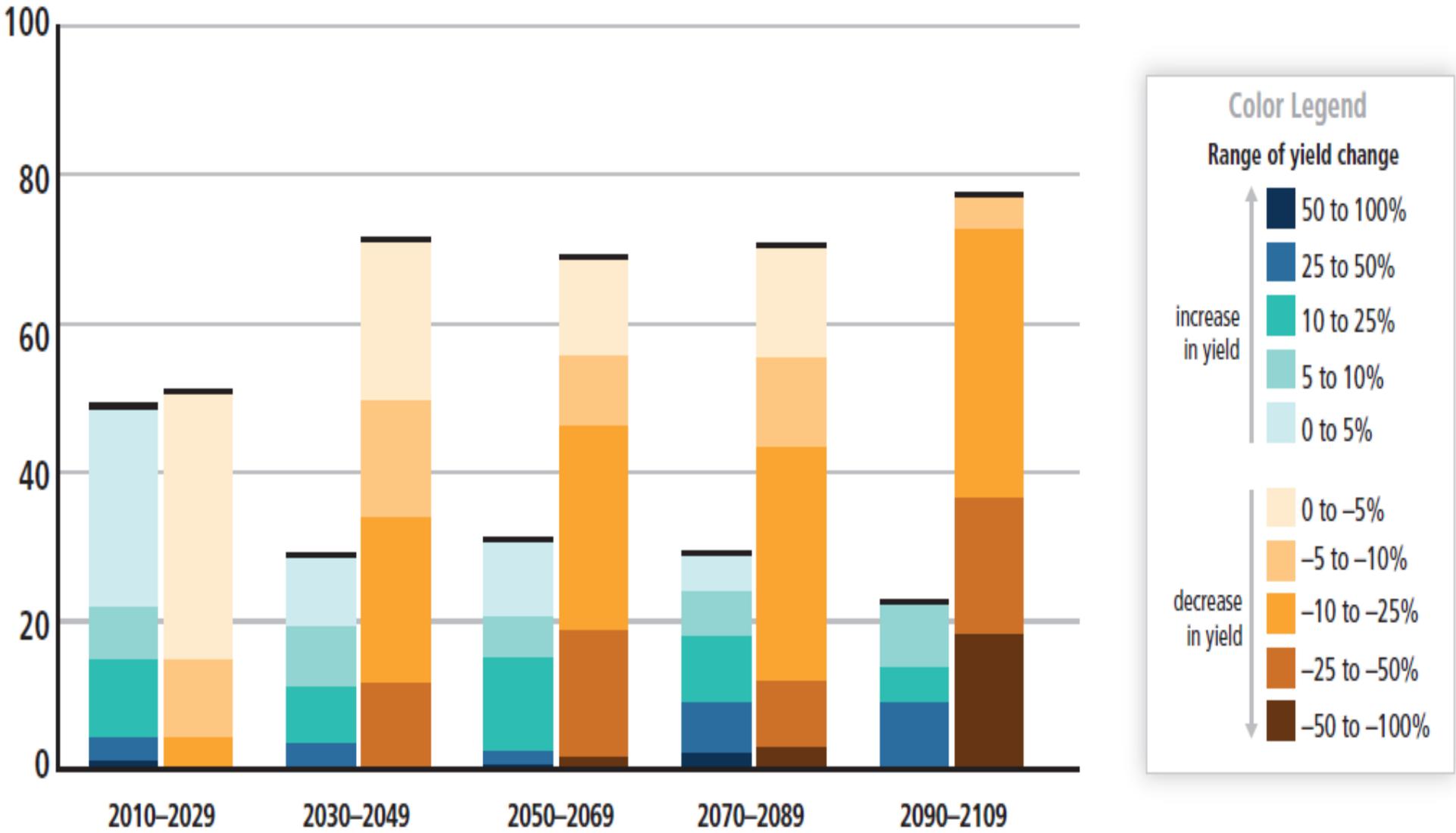
Food security

- **Climate change has negatively affected wheat and maize yields for many regions and in the global aggregate.** Effects on rice and soybean yield have been smaller in major production regions and globally. Observed impacts relate mainly to production aspects of food security rather than access.
- **For the major crops (wheat, rice, and maize) in tropical and temperate regions, climate change without adaptation is projected to negatively impact production for local temperature increases of 2°C or more above late-20th-century levels, although individual locations may benefit**
- **Global climate change risks are high to very high with global mean temperature increase of 4°C, and include large risks to global and regional food security, and the combination of high temperature and humidity compromising normal human activities, including growing food or working outdoors in some areas for parts of the year.** Redistribution of marine fisheries catch towards higher latitudes poses risk of reduced supply, income and employment.

Climate change and agriculture



Projected changes in crop yields (%)



4. Challenges to human security



Multiple stressors

Climate change

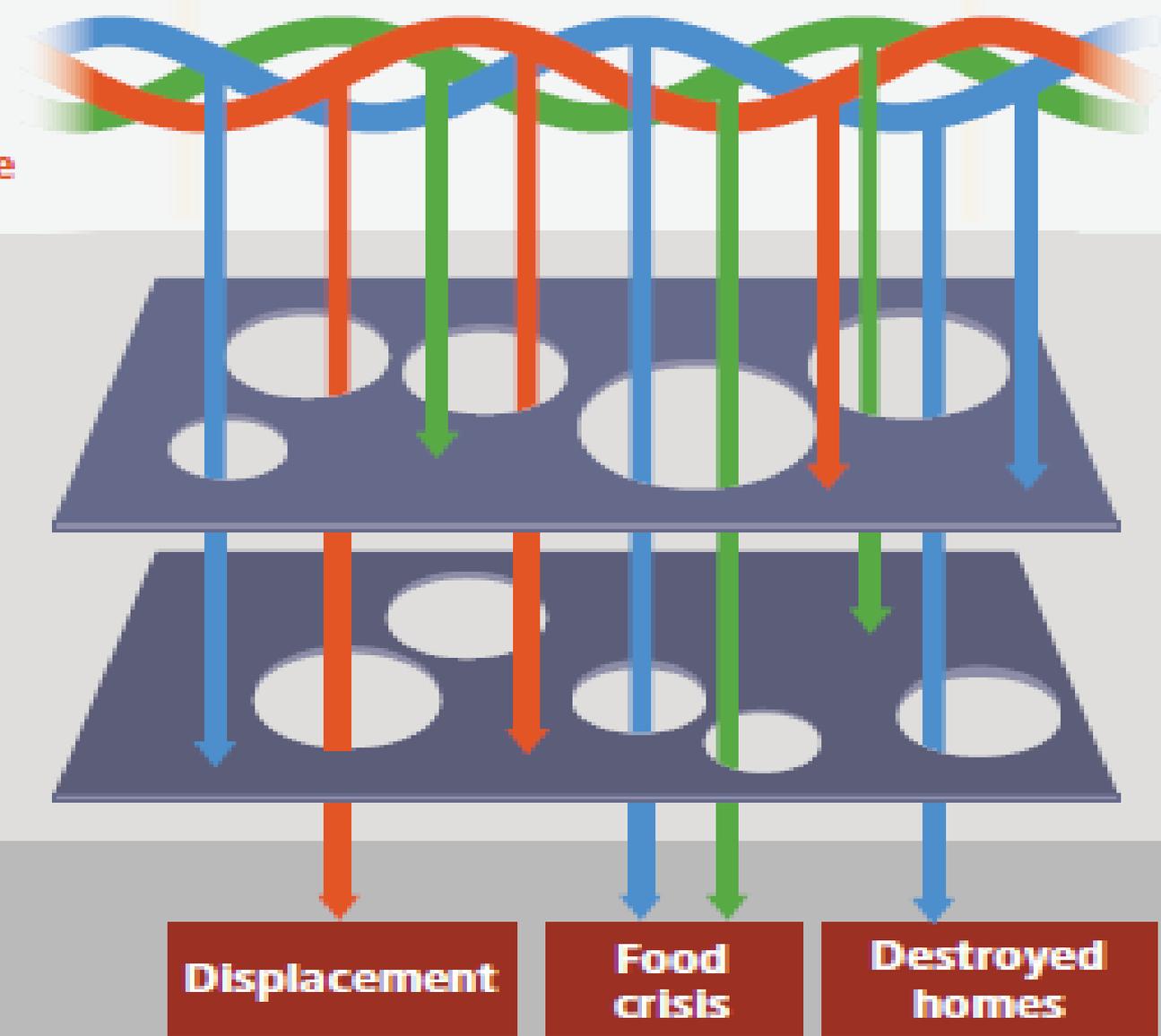
Globalizations

Technological change

Institutions such as:

- Social protection
- Relief organizations
- Disaster prevention

Livelihoods



Displacement

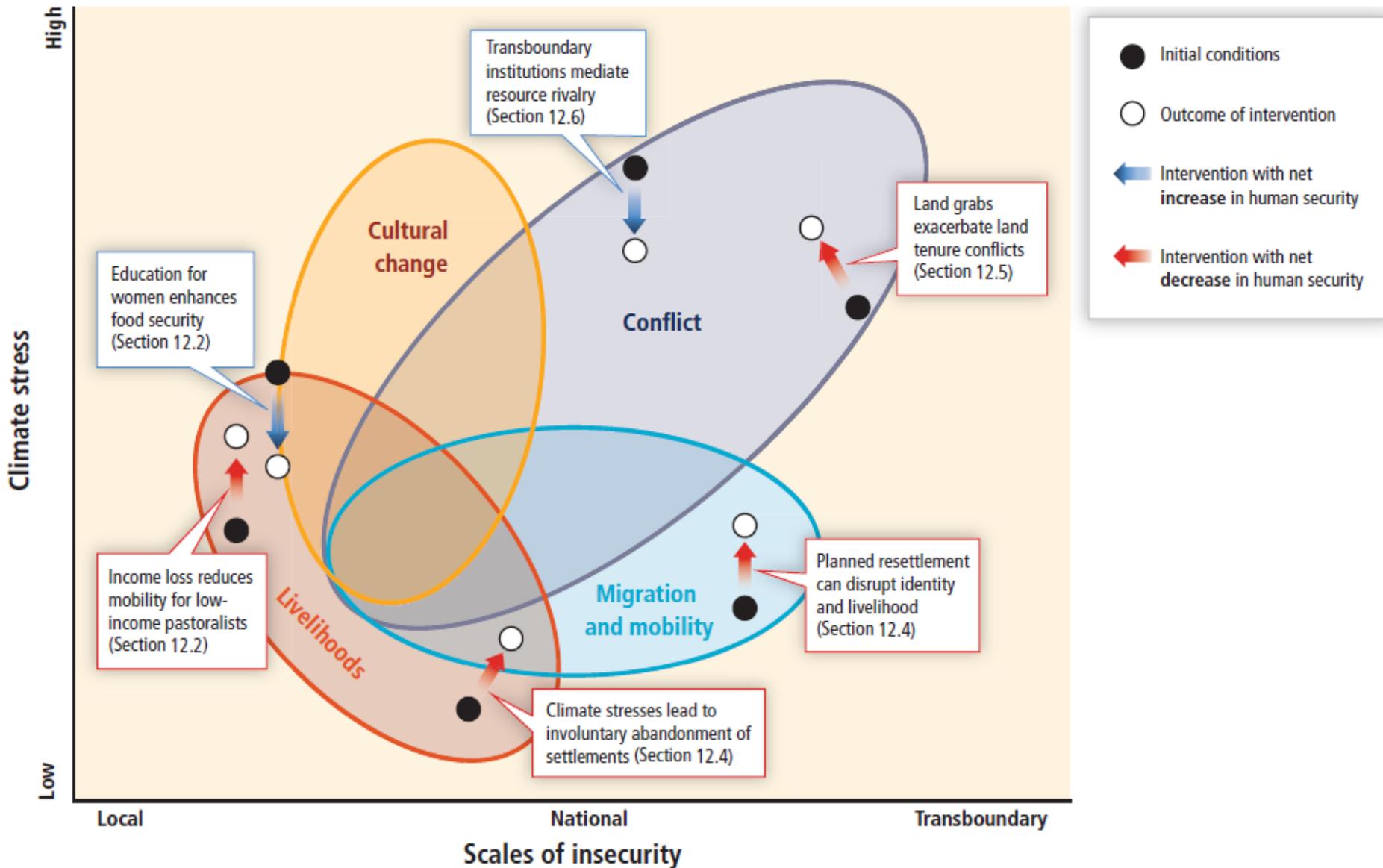
**Food
crisis**

**Destroyed
homes**

Human security

- **Climate change over the 21st century is projected to increase displacement of people.** Displacement risk increases when populations that lack the resources for planned migration experience higher exposure to extreme weather events, particularly in developing countries with low income. Expanding opportunities for mobility can reduce vulnerability for such populations. Changes in migration patterns can be responses to both extreme weather events and longer-term climate variability and change, and **migration can also be an effective adaptation strategy.**
- **Climate change can indirectly increase risks of violent conflicts in the form of civil war & inter-group violence by amplifying well-documented drivers of these conflicts such as poverty and economic shocks.**
- **The impacts of climate change on the critical infrastructure and territorial integrity of many states are expected to influence national security policies:** land inundation due to sea level rise poses risks to the territorial integrity of small island. Some transboundary impacts of climate change, such as changes in sea ice, shared water resources, and pelagic fish stocks, have the potential to increase rivalry among states, but **robust national and intergovernmental institutions can enhance cooperation and manage many of these rivalries.**

Climate stress, conflicts and human security

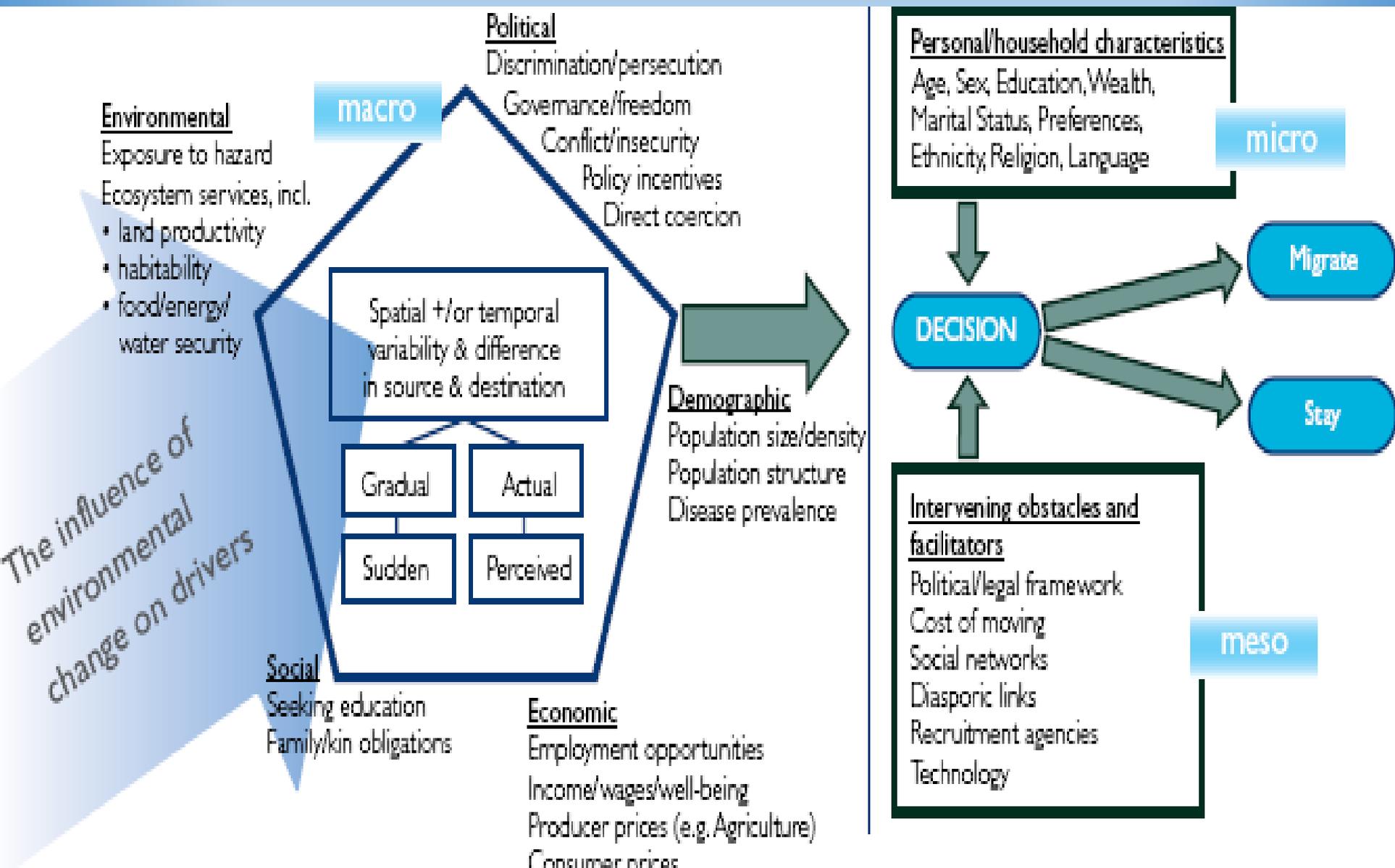


- **Human security will be progressively threatened as the climate changes.**
- **Climate change will compromise the cultural values that are important for community and individual wellbeing**
- **Indigenous, local and traditional forms of knowledge are a major resource for adapting to climate change**
- **Climate change will have significant impacts on forms of migration that compromise human security**
- **Mobility is a widely used strategy to maintain livelihoods in response to social and environmental changes**
- **Some of the factors that increase the risk of violent conflict within states are sensitive to climate change**
- **People living in places affected by violent conflict are particularly vulnerable to climate change**
- **Climate change will lead to new challenges to states and will increasingly shape both conditions of security and national security policies**

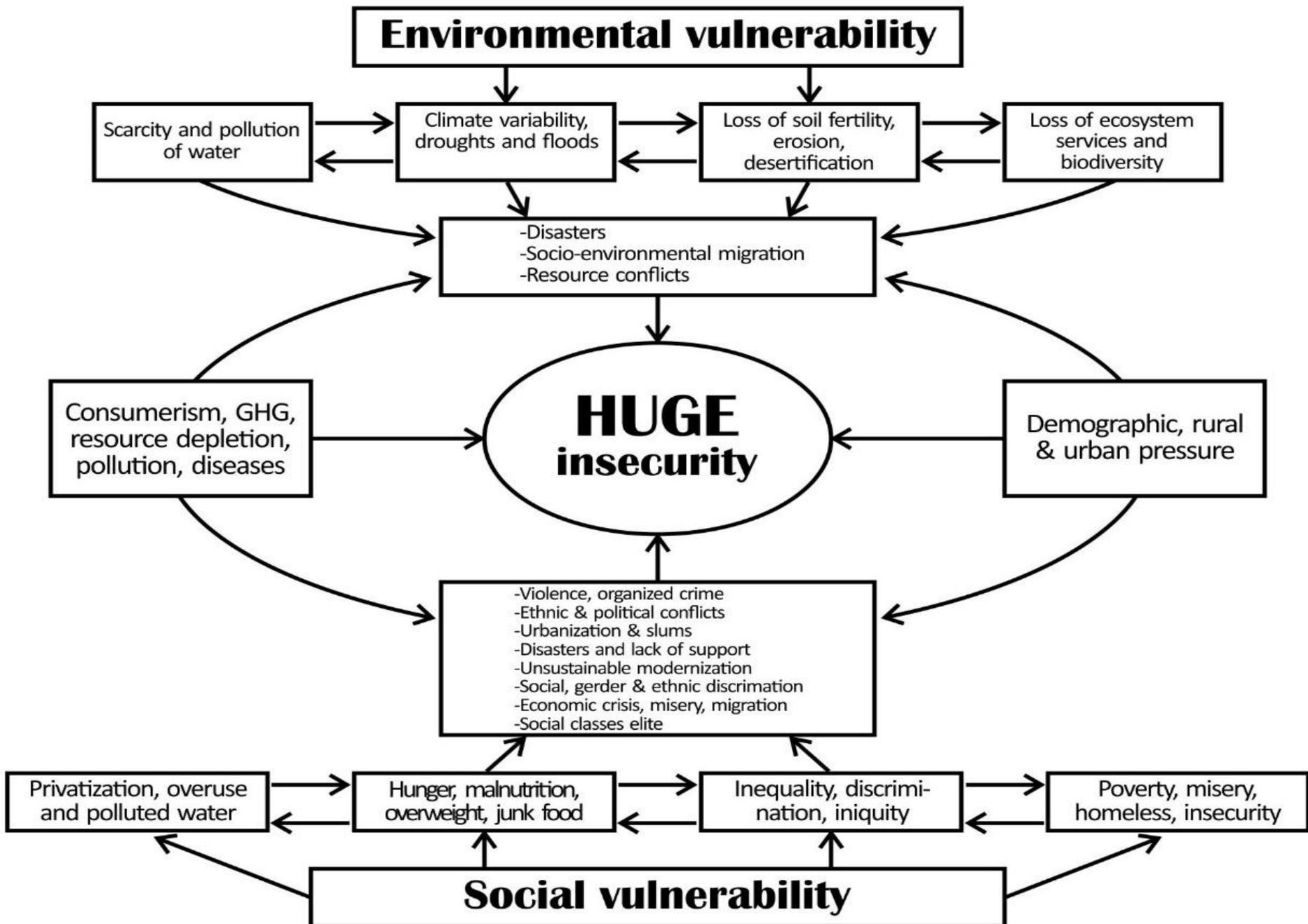
Climate-induced migration

Source: UK

Government Office for Science (2011: 12)

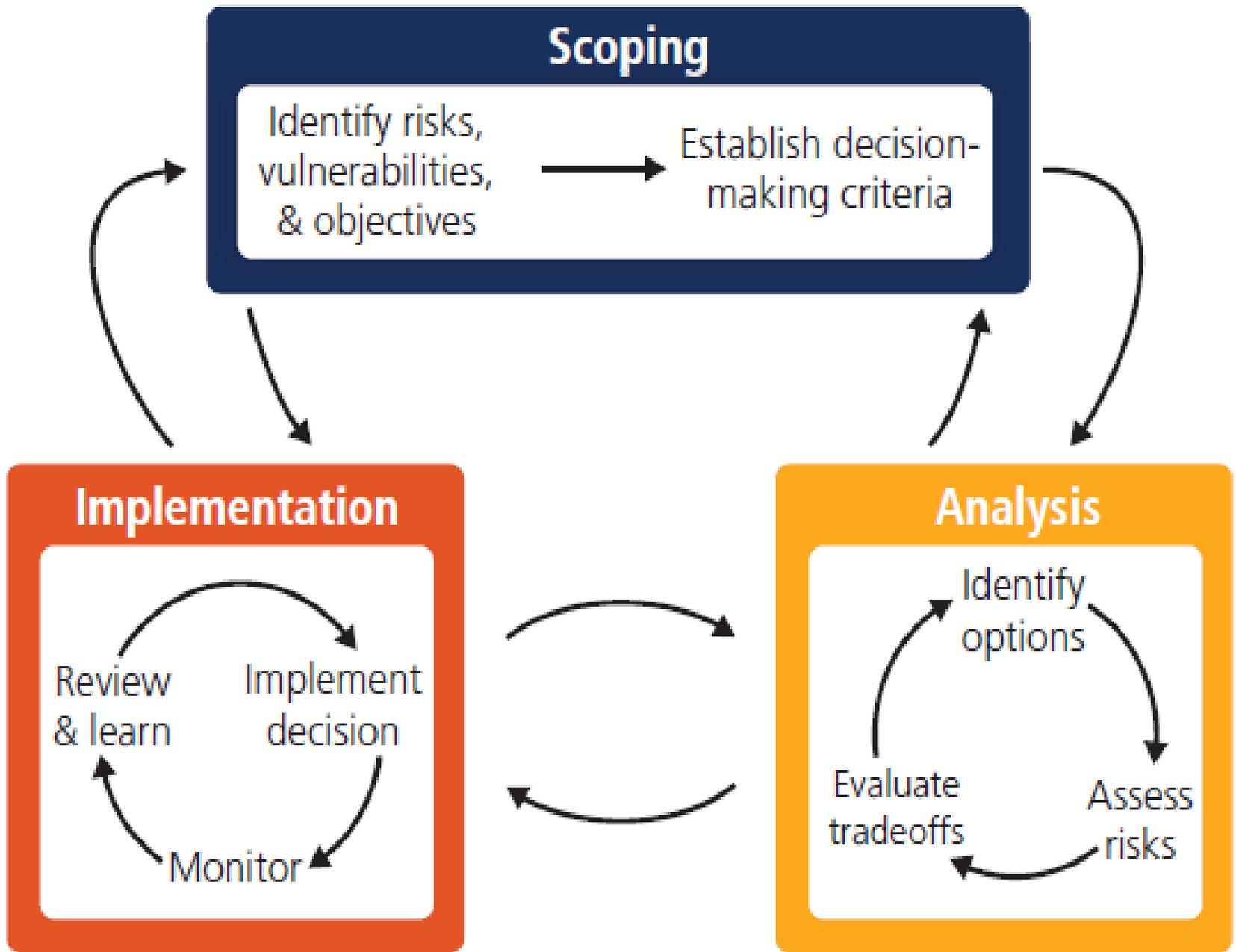


Environmental vulnerability





6. Adaptation and resilience building from bottom-up and top down



Primary Actors

INTERNATIONAL

- Bilateral and multilateral partners
- Intergovernmental organizations

NATIONAL / SUB-NATIONAL

- National government and statutory agencies
- Civil society organizations
- Private sector
- Research and communication bodies
- Local government agencies

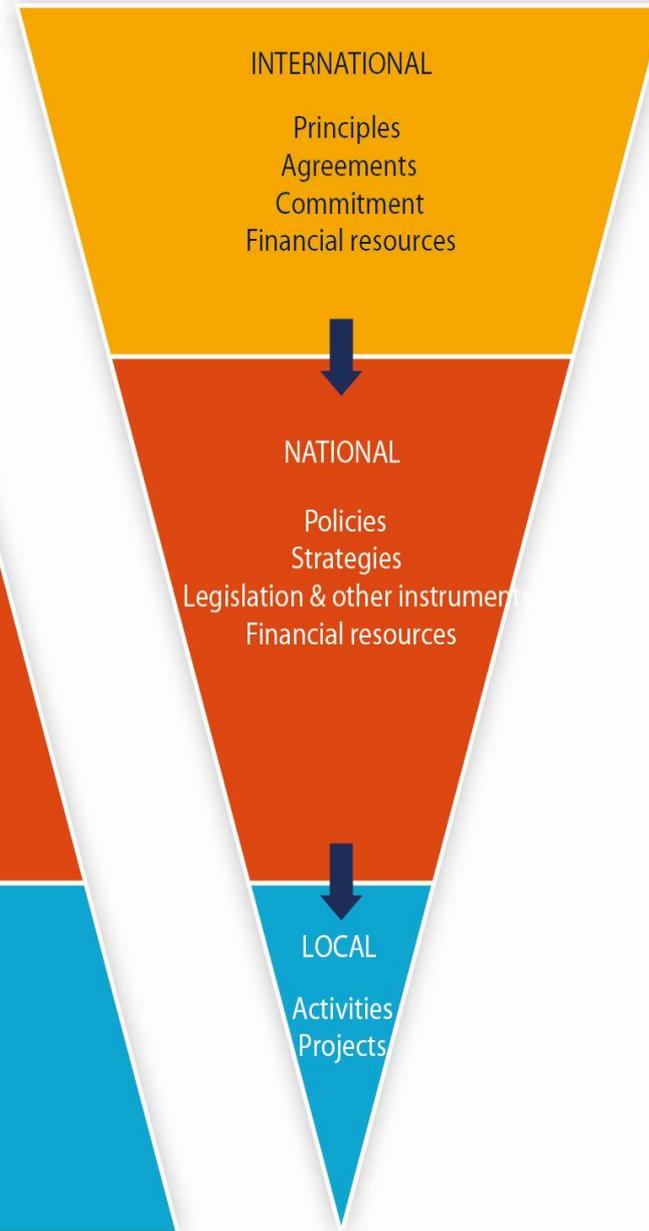
LOCAL

- Individuals, households, and communities
- Private sector
- Community-based organizations
- Faith-based organizations

"BOTTOM-UP" Functions



"TOP-DOWN" Functions



Global Climate
Projections

Regional / National
Climate Projections

Scientific and Local
Experiential
Knowledge

Vulnerability,
Risk, and Adaptation
Assessments

Thank you for your attention

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