



# From globally cascading climate risks to European climate risk assessments

Union Civil Protection Knowledge Network  
8<sup>th</sup> November 2023

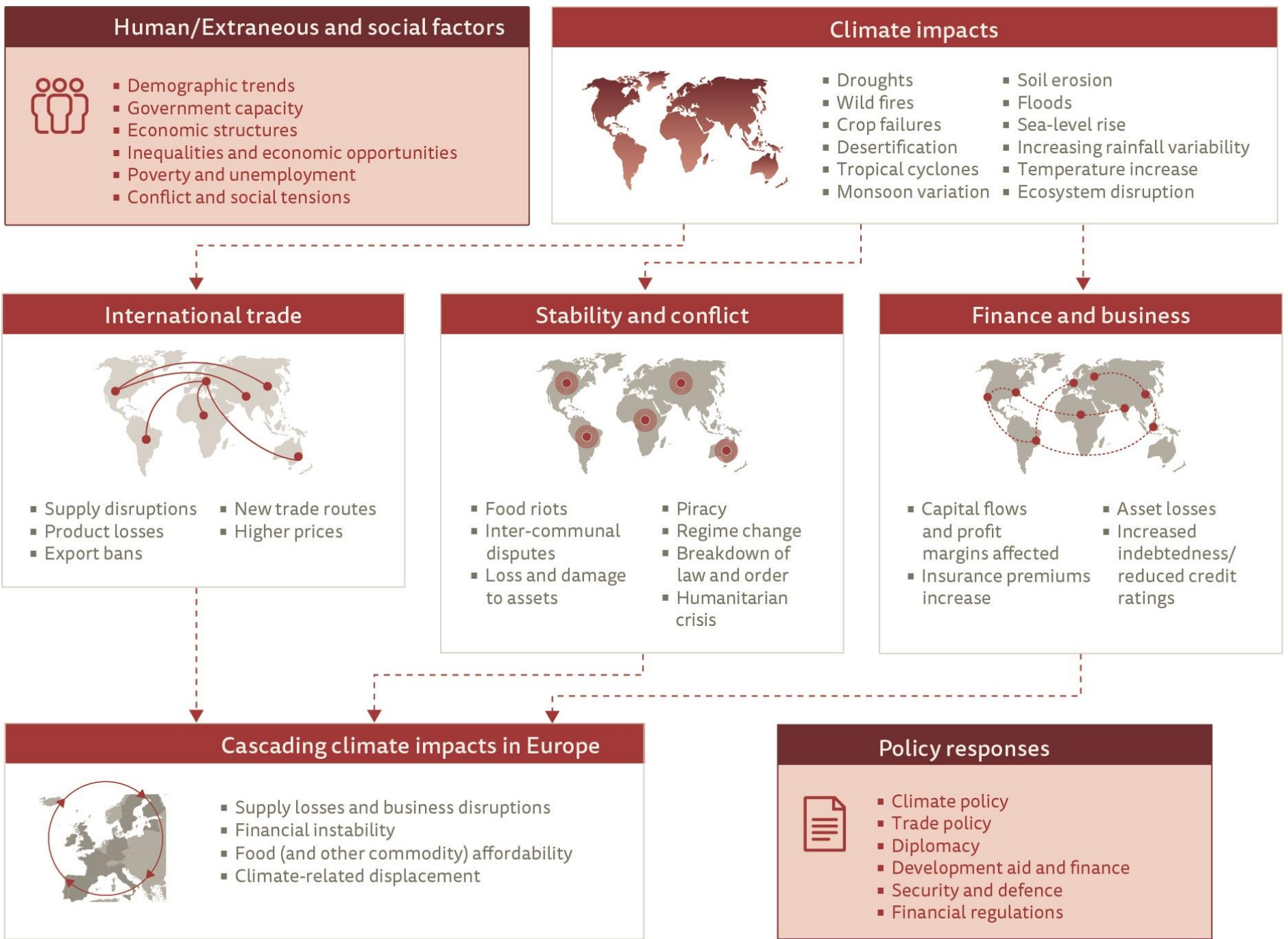
Magnus Benzie (SEI)  
Hanne Knaepen (ECDPM)  
Ruth Townend (Chatham House)



# The CASCADES consortium







### Human/Extraneous and social factors



- Demographic trends
- Government capacity
- Economic structures
- Inequalities and economic opportunities
- Poverty and unemployment
- Conflict and social tensions

### Climate impacts



- Droughts
- Wild fires
- Crop failures
- Desertification
- Tropical cyclones
- Monsoon variation
- Soil erosion
- Floods
- Sea-level rise
- Increasing rainfall variability
- Temperature increase
- Ecosystem disruption

### International trade



- Supply disruptions
- Product losses
- Export bans
- New trade routes
- Higher prices

### Stability and conflict



- Food riots
- Inter-communal disputes
- Loss and damage to assets
- Piracy
- Regime change
- Breakdown of law and order
- Humanitarian crisis

### Finance and business



- Capital flows and profit margins affected
- Insurance premiums increase
- Asset losses
- Increased indebtedness/reduced credit ratings

### Cascading climate impacts in Europe



- Supply losses and business disruptions
- Financial instability
- Food (and other commodity) affordability
- Climate-related displacement

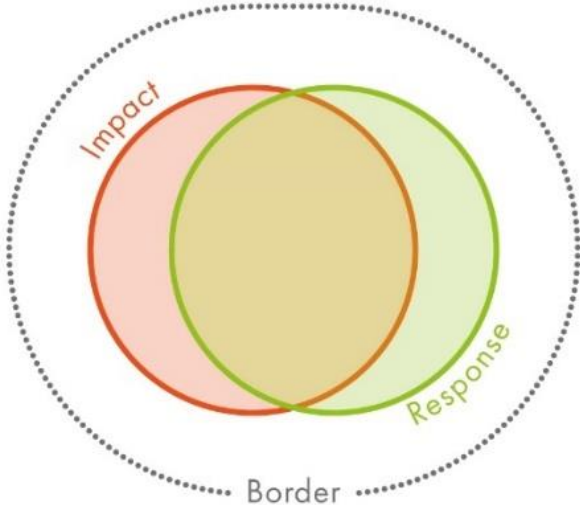
### Policy responses



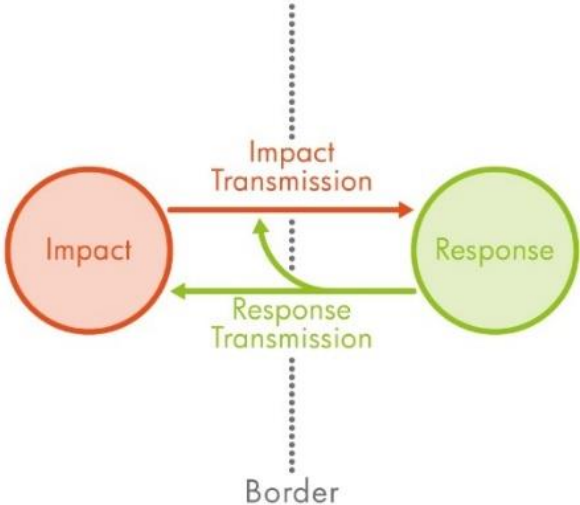
- Climate policy
- Trade policy
- Diplomacy
- Development aid and finance
- Security and defence
- Financial regulations

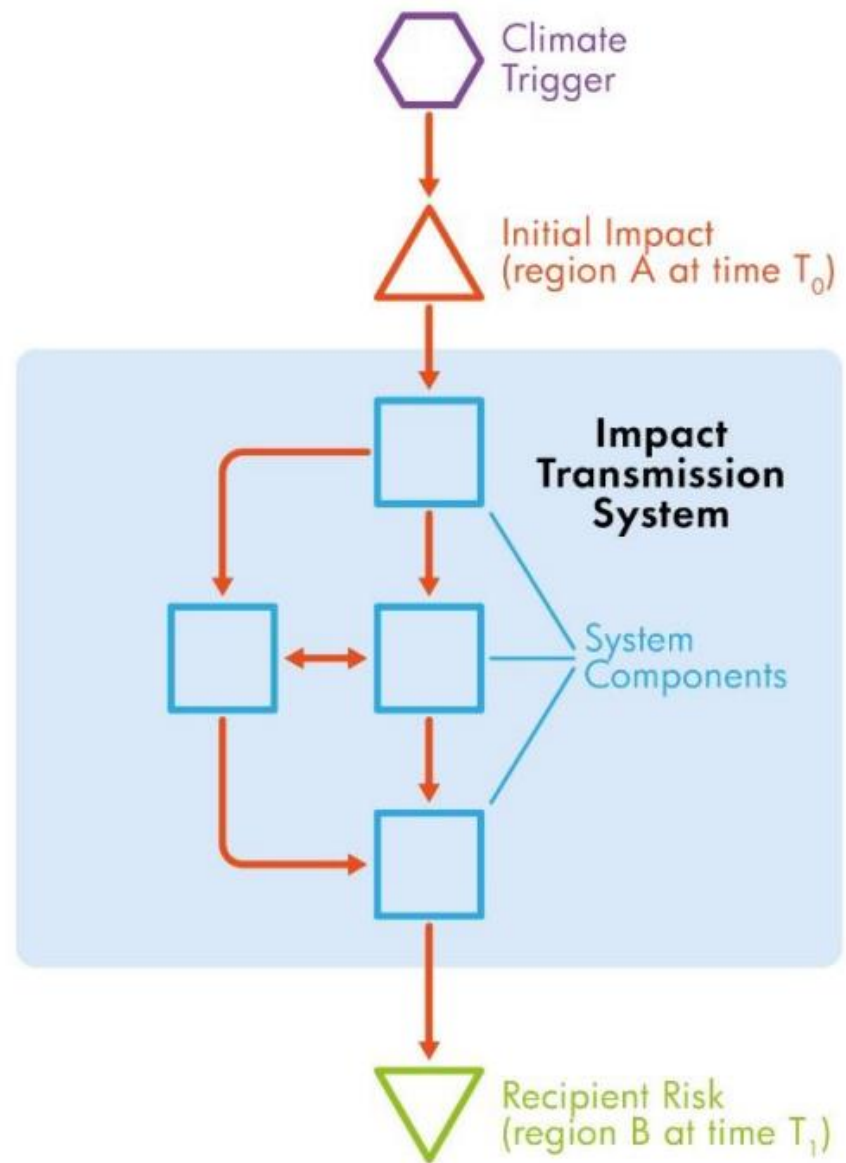
# A new factor in policy making

A) CONVENTIONAL ASSESSMENT



B) CROSS-BORDER ASSESSMENT

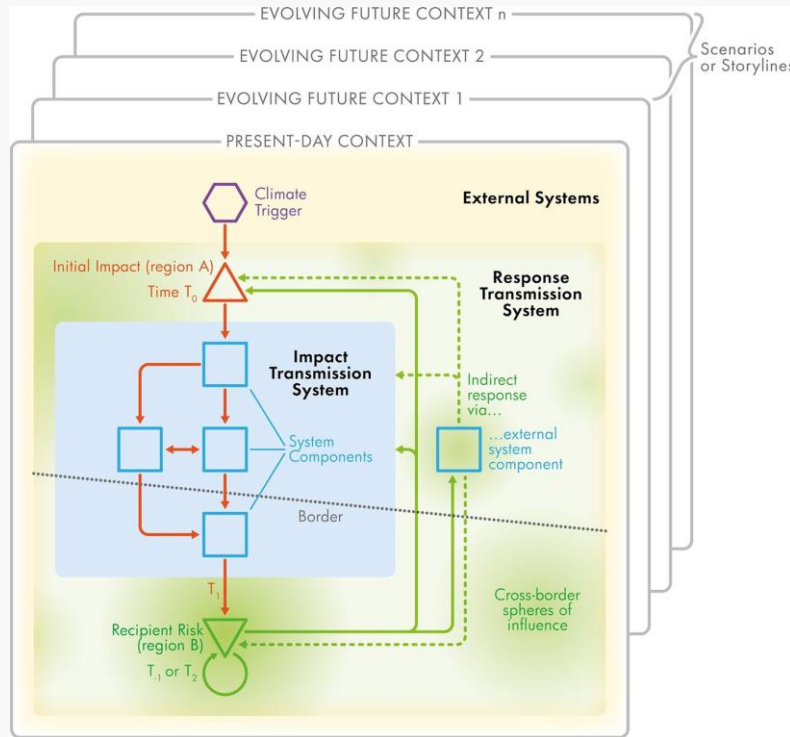




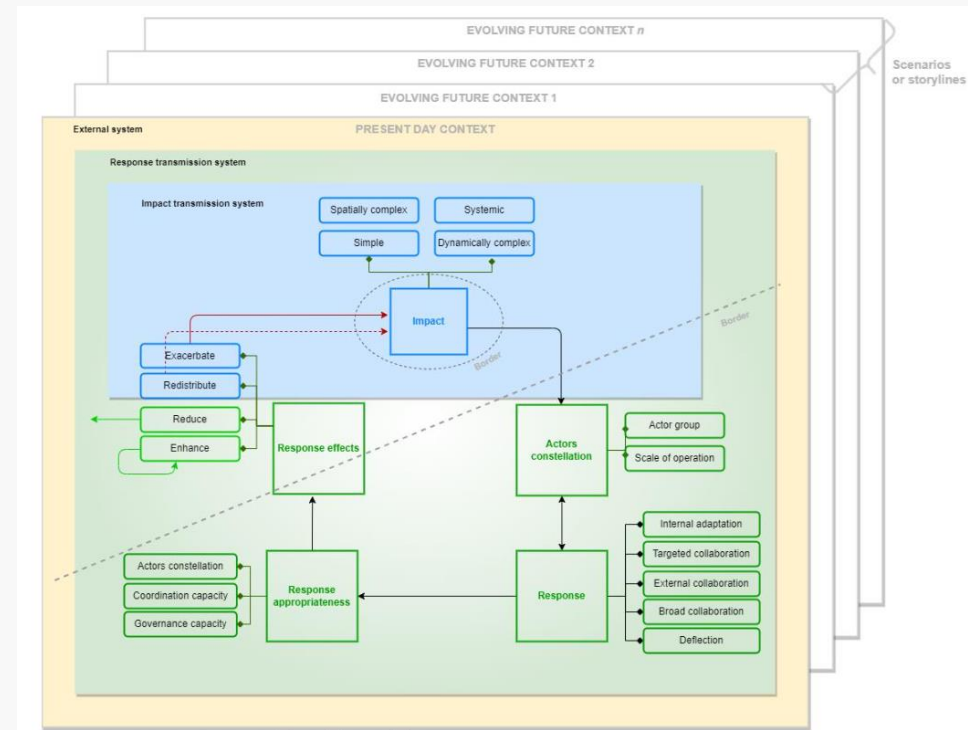
# Scientific Advances

- 23 published papers
- 17 submitted or in preparation

- 21 technical & research reports, book chapters, etc.
- 18 policy briefs



Conceptual framework



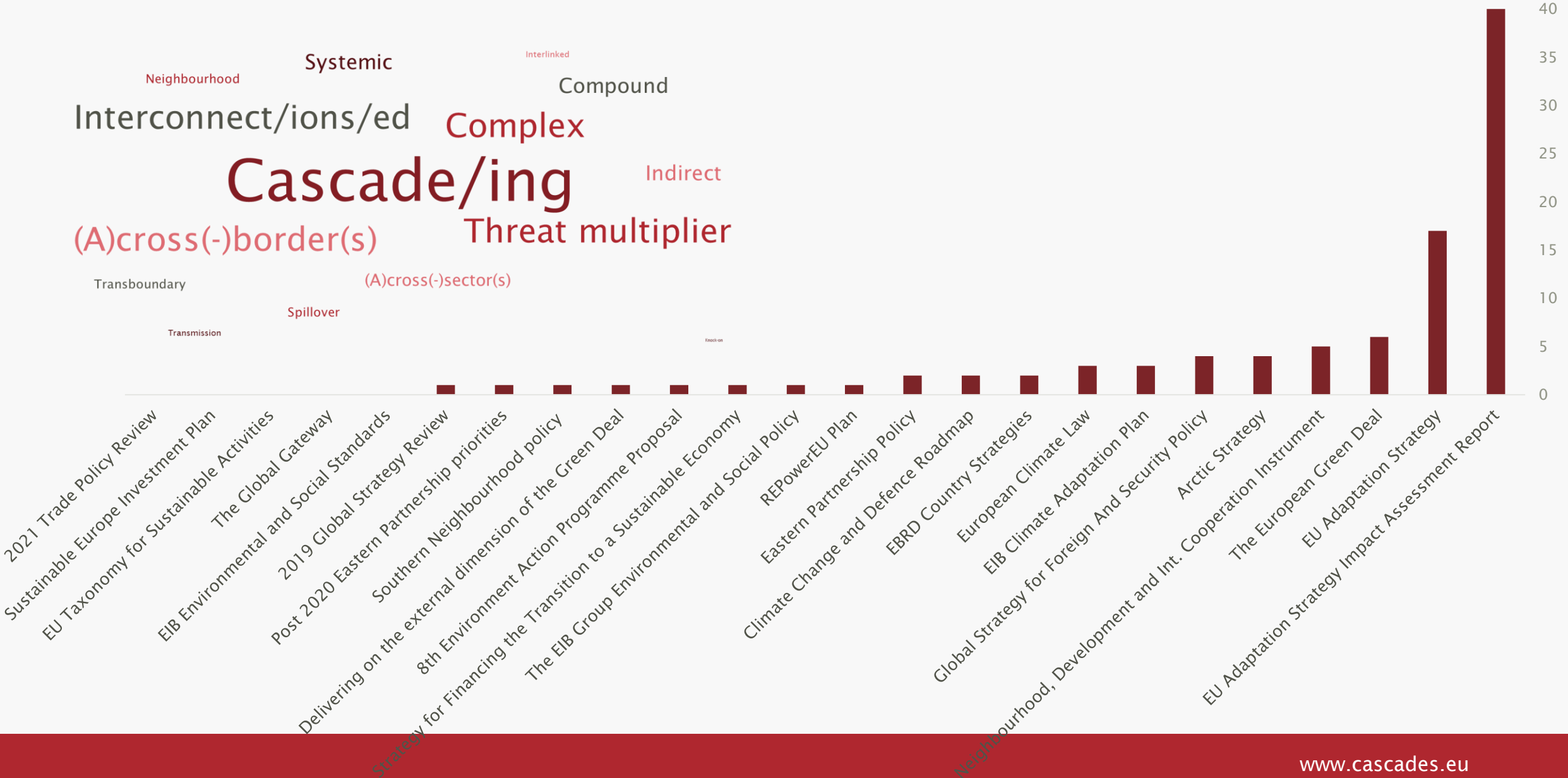
Response framework

Carter et al. 2021  
Global  
Environmental  
Change

Talebian et al.  
submitted

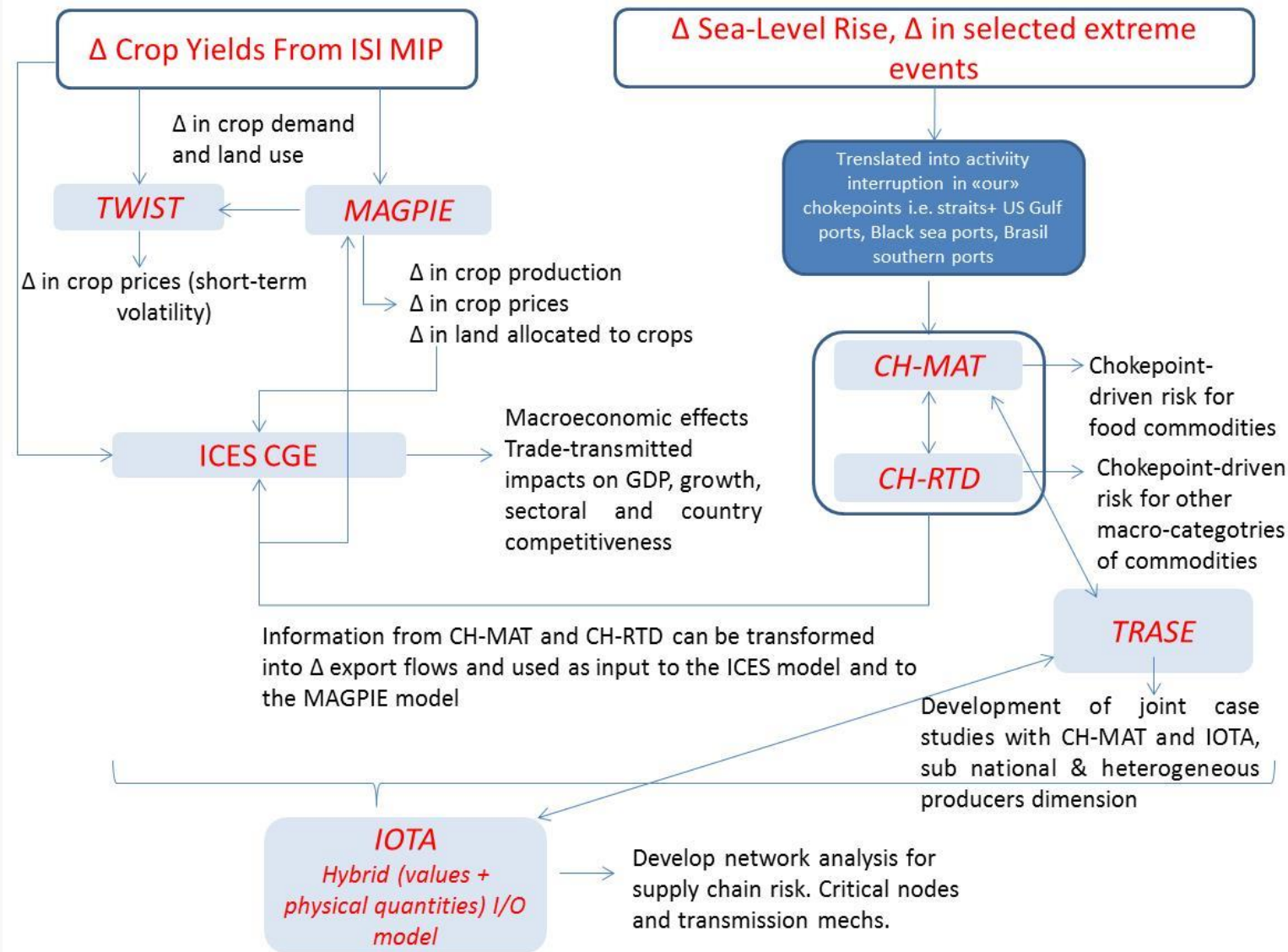
4 CASCADES papers cited 25 times in IPCC AR6 WGII

# Cascading climate risk in European policies





# A modelling chain to consider a wide range of scenarios







## Panama Canal

Strong El Niño > Dry weather in C. Am > Low water levels in lakes > Vessel depth restrictions ('97-98, '16)

**53%** of annual agri throughput assumed affected (*vessels with 70% of agri produce for 6 months during which 75% of ag throughput occurs*)

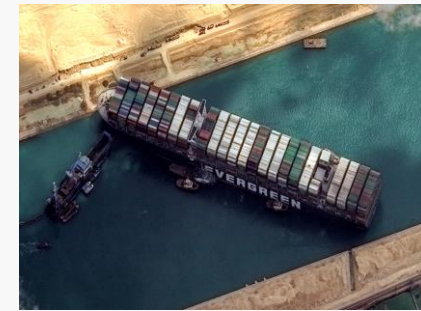


## Turkish Straits

Syria war re-escalated by climate impacts > Russia and Turkish proxy conflict > Turkish blockage ('15, '16)

**12%** of annual agri throughput (*2 months, 40% Black Sea exports, of which 30% spoiled, not stored*)

**Ukraine conflict...**



## Suez Canal (and Strait of Bab al-Mandab)

Amplified jet stream in region (increasing freq) > Strong storm surges in N Red Sea, sandstorms ('10, '15, '21) > Infrastructure damage at Port Taofik, canal unnavigable for 6 weeks)

**12%** of annual agri throughput

**TROUBLES IN AMERICAN BREADBASKETS**



**FOOD CRISIS... OR TRANSFORMATION?**



**THE PHOSPHATE DEBACLE**



**AN EPIDEMIC OF FUNGI AND DISTRUST**



**THE DEMISE OF THE SOY & CORN BASKET**





# GLOBAL IMPACTS

Protectionist policies  
Global food price increase  
Global agrochemicals supply shock & price spike  
Risk for banks  
Risk of food price increase  
Risk for the rise of populism  
Risks for crop production  
Challenges related to forced migration  
Risks of supply chains disruption  
Global natural gas supply shock and price spike

### NORTH AMERICA

- Increased delays in shipping
- Port & road infrastructure damage
- Hurricane
- Decline in corn and soy production
- Flood and droughts
- High weather and climate variability
- Reduced corn and soy export

### NORTH AFRICA

- Drought
- Prolonged lack of precipitation
- Decline in food production
- Political destabilization
- Chaos in Libya
- Reduced phosphate export
- Phosphate mining & supply chain disruption
- Declining trust in government
- Violent conflicts & terrorism
- Loss of livelihoods linked to production & logistics
- More frequent and severe droughts and floods
- Increasingly erratic rainfall
- Higher temperatures
- Decline in food production

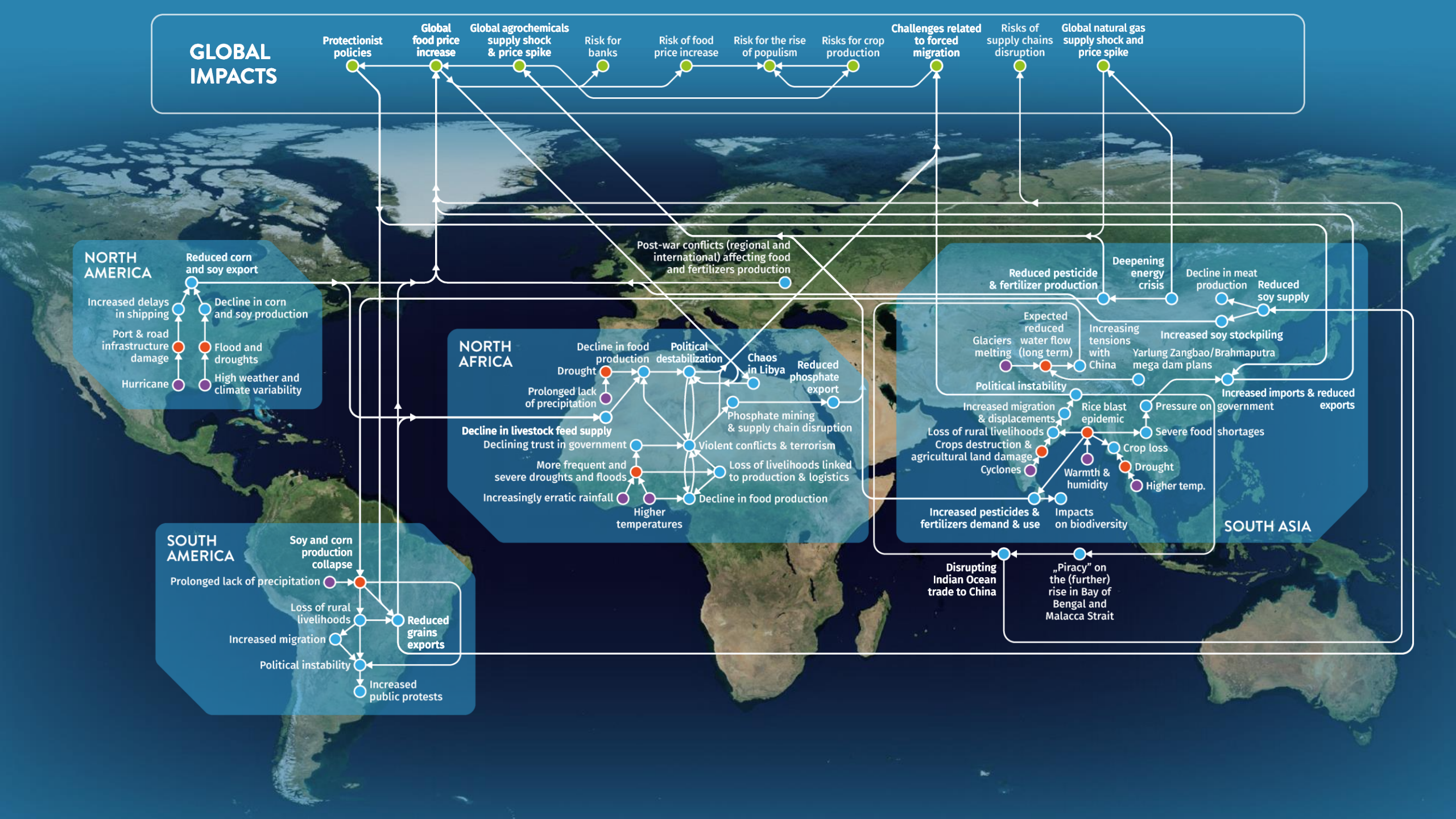
### SOUTH AMERICA

- Prolonged lack of precipitation
- Loss of rural livelihoods
- Increased migration
- Political instability
- Increased public protests
- Reduced grains exports
- Soy and corn production collapse

### SOUTH ASIA

- Glaciers melting (long term)
- Expected reduced water flow
- Increasing tensions with China
- Yarlung Zangbao/Brahmaputra mega dam plans
- Political instability
- Increased migration & displacements
- Loss of rural livelihoods
- Crops destruction & agricultural land damage
- Cyclones
- Warmth & humidity
- Higher temp.
- Drought
- Increased pesticides & fertilizers demand & use
- Impacts on biodiversity
- Disrupting Indian Ocean trade to China
- „Piracy“ on the (further) rise in Bay of Bengal and Malacca Strait
- Deepening energy crisis
- Decline in meat production
- Reduced soy supply
- Increased soy stockpiling
- Increased imports & reduced exports
- Pressure on government
- Severe food shortages
- Crop loss
- Rice blast epidemic

Post-war conflicts (regional and international) affecting food and fertilizers production

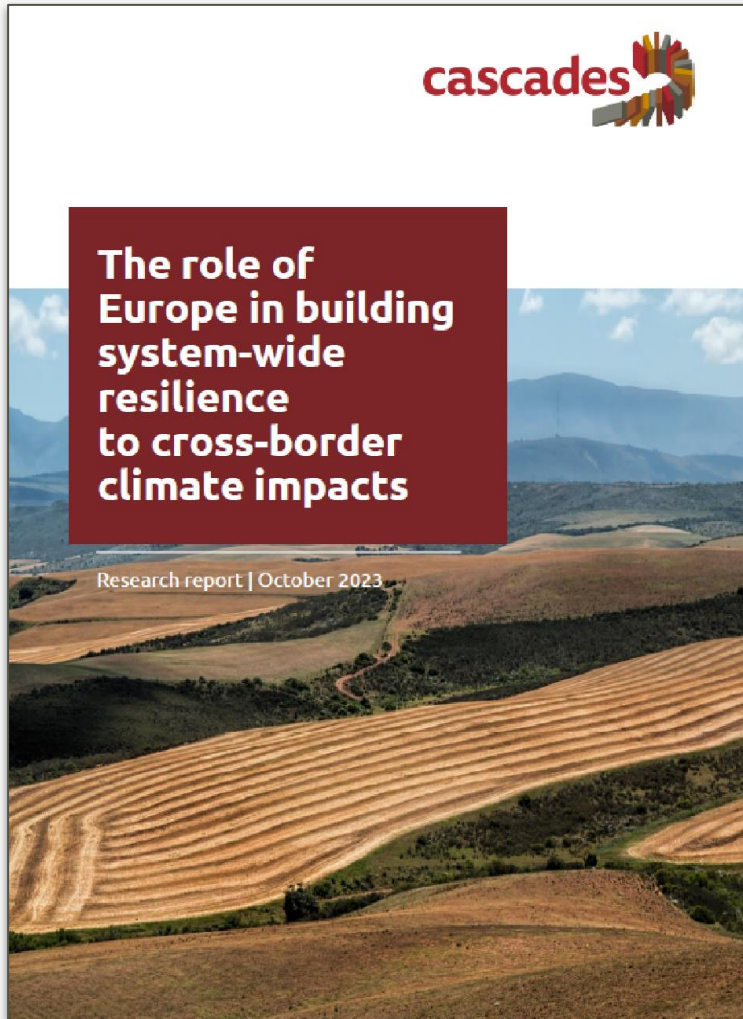


# Cascading climate risks in Africa





# The role of Europe in building system-wide resilience to cross-border climate impacts

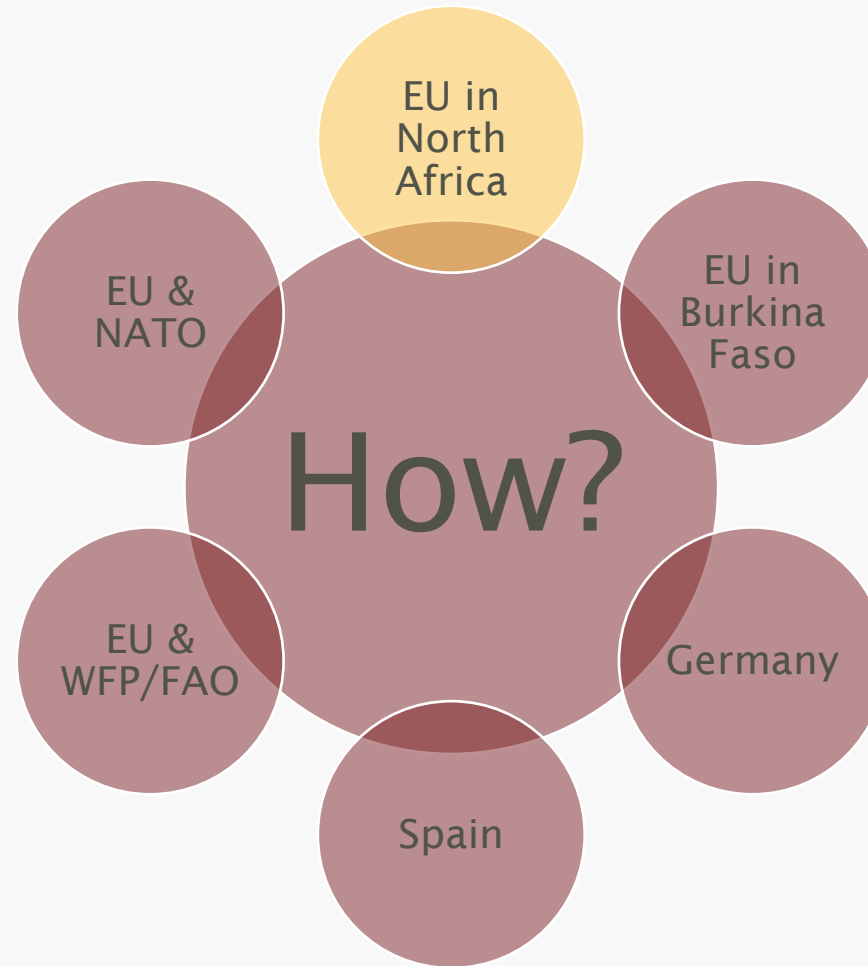
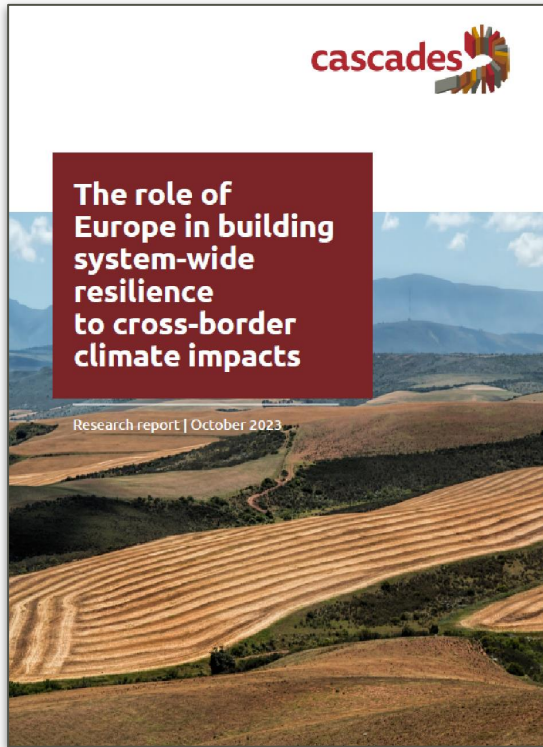


*The strong likelihood of increasing cascading climate impacts makes the question of how the EU and its member states, in close cooperation with global actors, might build system-wide resilience in its surrounding regions an increasingly strategic political priority.*

But, how to do this?



# The role of Europe in building system-wide resilience to cross-border climate impacts (originating in agri-food systems)



# The role of Europe in building system-wide resilience to cross-border climate impacts



Dakar workshop,  
March 2023



Stockholm workshop,  
March 2023



Tunis AfD event, June  
2022



# The role of Europe in building system-wide resilience to cross-border climate impacts

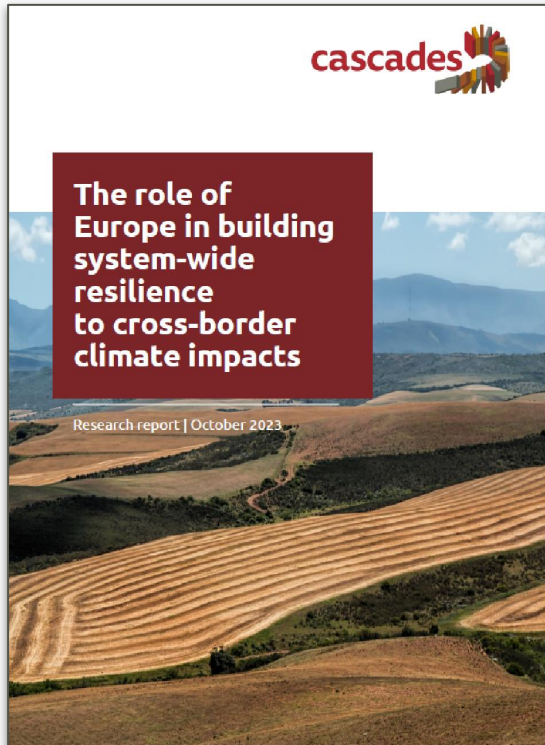


Figure - Europe's four strategic challenges to building system-wide resilience to cross-border climate impacts



# Strategic Recommendations for European Resilience



# Recommendations: 4 steps to prepare for cascades

European institutions



Trade



Finance



Climate diplomacy



Global governance



European societies



1. Laying foundations  
e.g. establish risk ownership

2. Global responsibility & cooperation
- improve policy coherence
  - cooperate, lead and build trust within the international system
  - increased technical assistance and political engagement with partners
  - Formulate EU Trade Resilience Strategy
  - reform risk assessment and monitoring
  - mobilize European development finance for climate adaptation and resilience

3. Promotion of better governance for resilience

4. Preparing society
- resilient local economies & communities
  - reduce inequality & strengthen cohesion

# Conclusions



The European Union is not prepared



It must decide between a reactive or proactive approach



Rapid systemic transformation is needed – both to limit climate change impacts and to adapt



Cascades light a path by revealing the problems in our current systems and providing response options



European policymakers have an opportunity to effect systemic change in ways that support widespread, long-lived resilience



Thank you

Ruth Townend [RTownend@chathamhouse.org](mailto:RTownend@chathamhouse.org)

Hanne Knaepen [hk@ecdpm.org](mailto:hk@ecdpm.org)

Magnus Benzie [magnus.Benzie@sei.org](mailto:magnus.Benzie@sei.org)

Web: [cascades.eu](http://cascades.eu)

Email: [info@cascades.eu](mailto:info@cascades.eu)

Twitter: [@CASCADES\\_EU](https://twitter.com/CASCADES_EU)



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