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Assessing the adaptive capacity of spatial planning to climate change impacts in Alpine countries

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OUTLINE

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2 **Analytical framework**

3 **Methods**

4 **Results**

- **Architecture of spatial planning systems**
- **Characteristics of climate change adaptation**

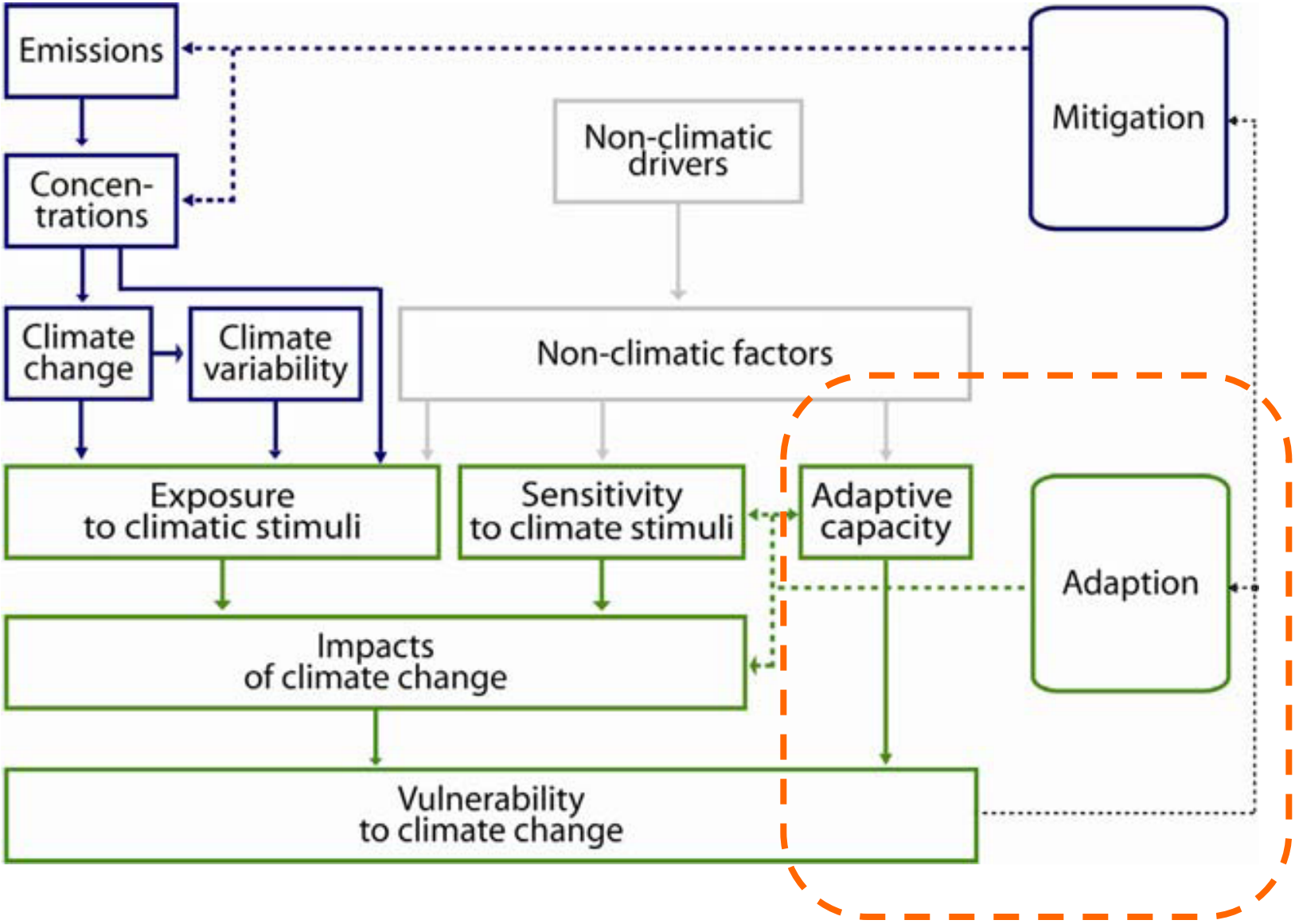
5 **Conclusion**

1 Introduction

- **Problem focus: adaptation to climate change impacts**
- Field of action: spatial planning (multi-level governance)
- Regional focus: Alpine space

→ **Climate change adaptation**

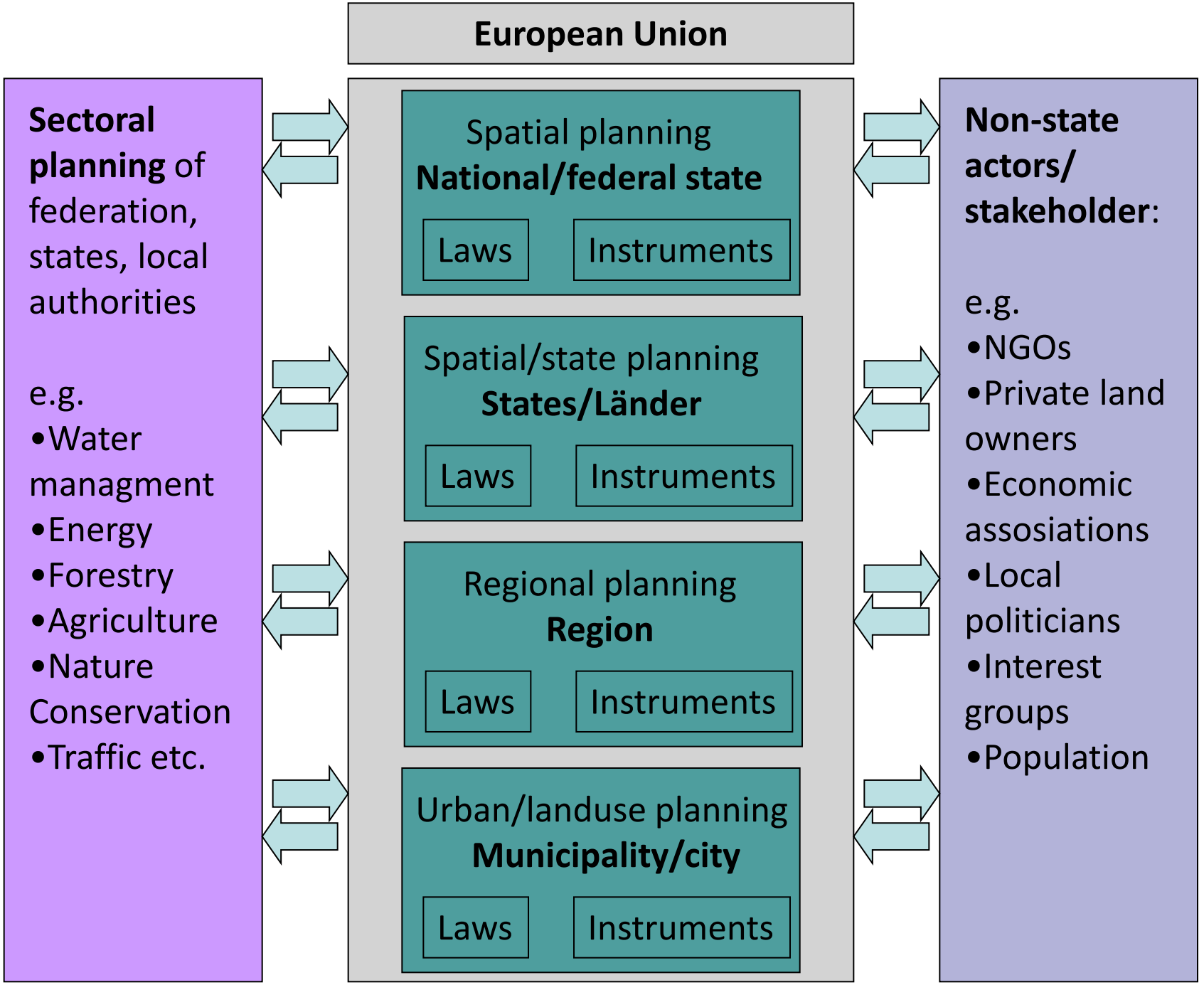
"adjustments to reduce vulnerability or enhance resilience in response to observed or expected changes in climate and associated extreme weather events" (IPCC 2007)



(Füssel/Klein 2002)

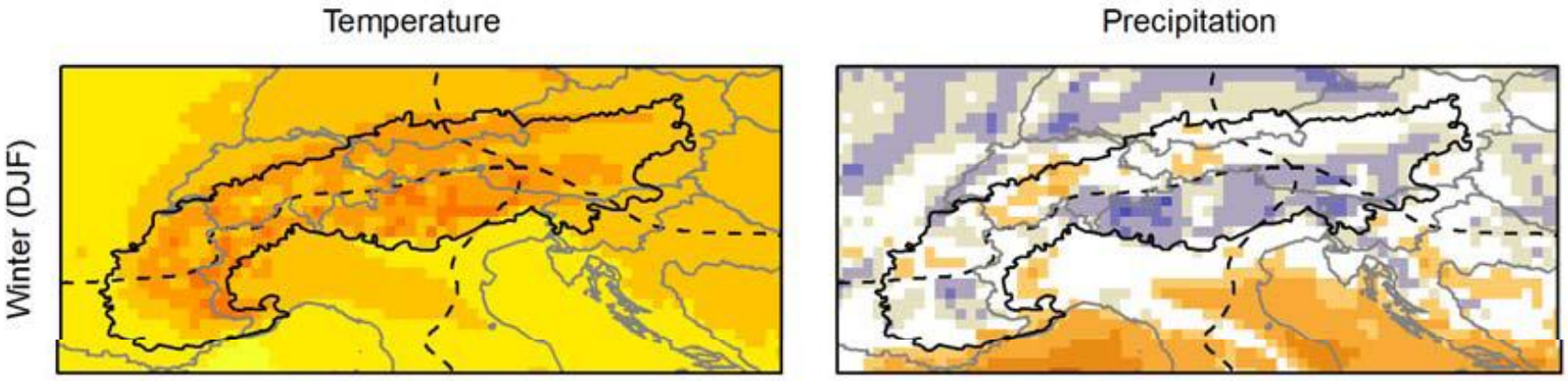
1 Introduction

- Problem focus: adaptation to climate change impacts
- **Field of action: spatial planning (multi-level governance)**
- Regional focus: Alpine space


European Union
Sectoral planning of federation, states, local authorities
e.g.
•Water managment
•Energy
•Forestry
•Agriculture
•Nature Conservation
•Traffic etc.
Spatial planning
National/federal state
Laws
Instruments
Spatial/state planning
States/Länder
Laws
Instruments
Regional planning
Region
Laws
Instruments
Urban/landuse planning
Municipality/city
Laws
Instruments
Non-state actors/ stakeholder:
e.g.
•NGOs
•Private land owners
•Economic assosiations
•Local politicians
•Interest groups
•Population

1 Introduction

- Problem focus: adaptation to climate change impacts
- Field of action: spatial planning as multi-level system
- **Regional focus: Alpine space**



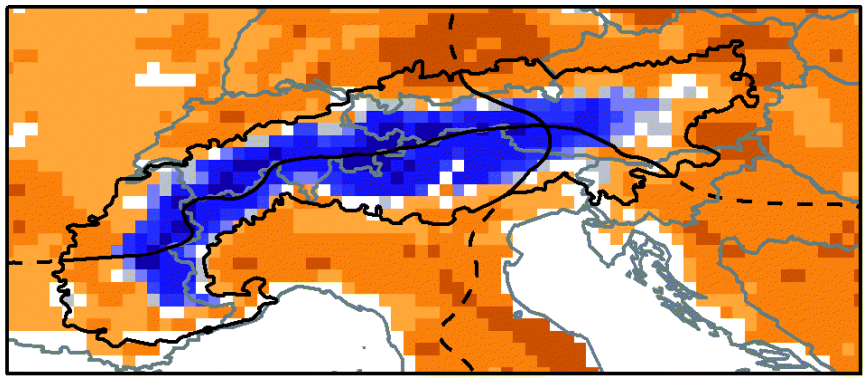
1 Introduction

Run-off and snow cover change up until the end of the 21st century in the winter, according to the CLM A1B scenario

Left: relative difference in water available for run-off.

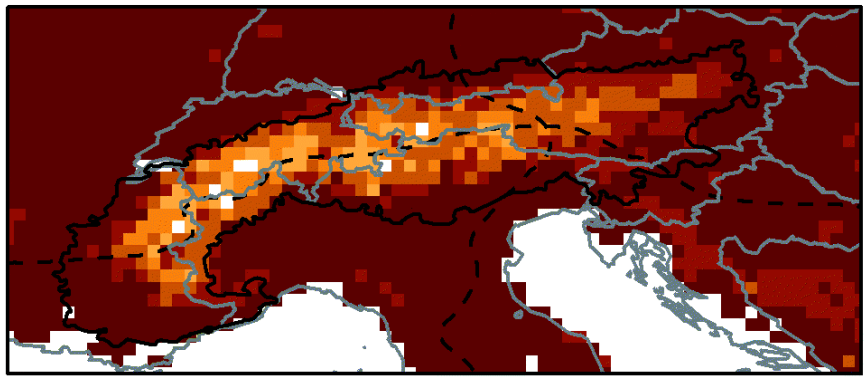
Right: relative difference in days with snow cover.

Runoff

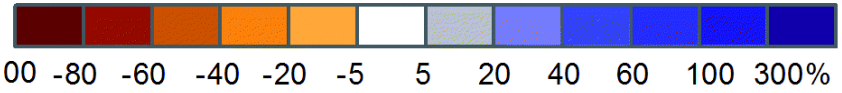


G: -8, A: 19, NW: 29, NE: -4, SW: 33, SE: 5, H: 128

Snow cover



G: -62, A: -50, NW: -40, NE: -64, SW: -51, SE: -73, H: -35



1 Introduction

"Spatial planning could provide an **integrated framework** to link up **vulnerability** and **risk assessment** with adaptive capacities and adaptation responses thus facilitating the identification of policy options and **cost-efficient** strategies." (European Commission 2007)

Research questions

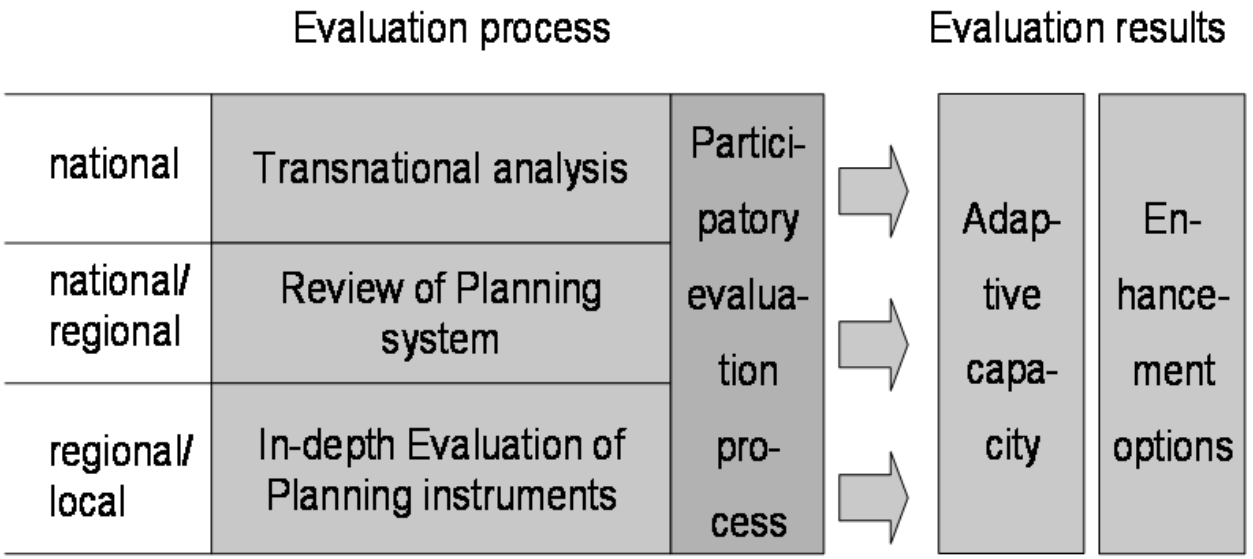
- How is climate adaptation coordinated in multi-level spatial planning systems in the Alpine space?
- How can governance patterns and mechanisms be adapted to climate change impacts?

2 Analytical framework

Evaluation Criteria: Assessing adaptive capacities of spatial planning

Governance patterns: architecture of spatial planning systems
Political framework
Legal framework
Instrumental framework
Implementation practises
Governance mechanisms: characteristics of climate change adaptation
Flexibility/Stability
Horizontal/vertical interplay
Resources

3 Methods



Evaluation process

4 Results: Governance patterns of spatial planning

1. **Political Framework**
   - Recently some adaptation strategies have been passed on transnational, national and regional level
   - Explicit political strategies are considered as highly relevant for successful adaptation activities.
2. **Legal Framework**
   - Adaptation only indirectly included in planning legislation (except Germany)
   - Highly relevant for legitimacy & awareness raising

4 Results: Governance patterns of spatial planning

3. Instrumental Framework

- Very few instruments that explicitly include cc adaptation.
- Existing instruments insufficient or sufficient but not implemented appropriately
- Limitations are seen in insufficient knowledge, non-binding character or low acceptance in planning practice & long-term versus short term interests.

4. Implementation practices

- prerequisites: intense cooperation with sectoral planning and support of landowners, municipalities, local public
- Monitoring system

4 Results: Governance characteristics of cc adaptation

5. Vertical/horizontal interplay

- Diverse cooperation activities within spatial planning as well as with sectoral planning and non-planning actors

6. Flexibility/stability

- Binding character of planning regulations
- Planning horizon 10-15 years, range of options in implementation

7. Resources

- Knowledge basis insufficient
- More personnel & professional training needed

5 Conclusions

Challenges for spatial planning

- Planning with growing uncertainties
  → Scenarios
- Planning the future = what to do with today‘s buildings, infrastructures etc.?
  → Shrinkage, Giving up settlements, Downscaling cities (Stadtumbau)
- Planning of critical infrastructures
  → infrastructures for everybody (Daseinsvorsorge)
- Climate Mainstreaming, Climate Proofing
  → SEA
- Low Carbon Planning, Zero Emission Cities
  → new planning concepts

5 Conclusions

Lessons learned from the Alpine space

- High adaptive capacity
- From reactive (e.g. water resource) management) to proactive climate change adaptation
- Complementing technological solutions with behavioural adaptation
- From sectoral to cross-sectoral adaptation
- From local to regional adaptation
- Improving multi-level governance and information flow

5 Conclusions

Principles of Good Adaptive Governance

- Explicitly include adaptation to climate change in political initiatives, planning legislation and instruments
- Prerequisites (for successful adaptation activities): public awareness, political willingness, Knowledge, cooperation
- Flexibility as crucial issue
- Learning to live with uncertainty

→ Remaining problem for assessing adaptive capacity:

How to adapt if you do not exactly know what to adapt to?

Thank you very much!

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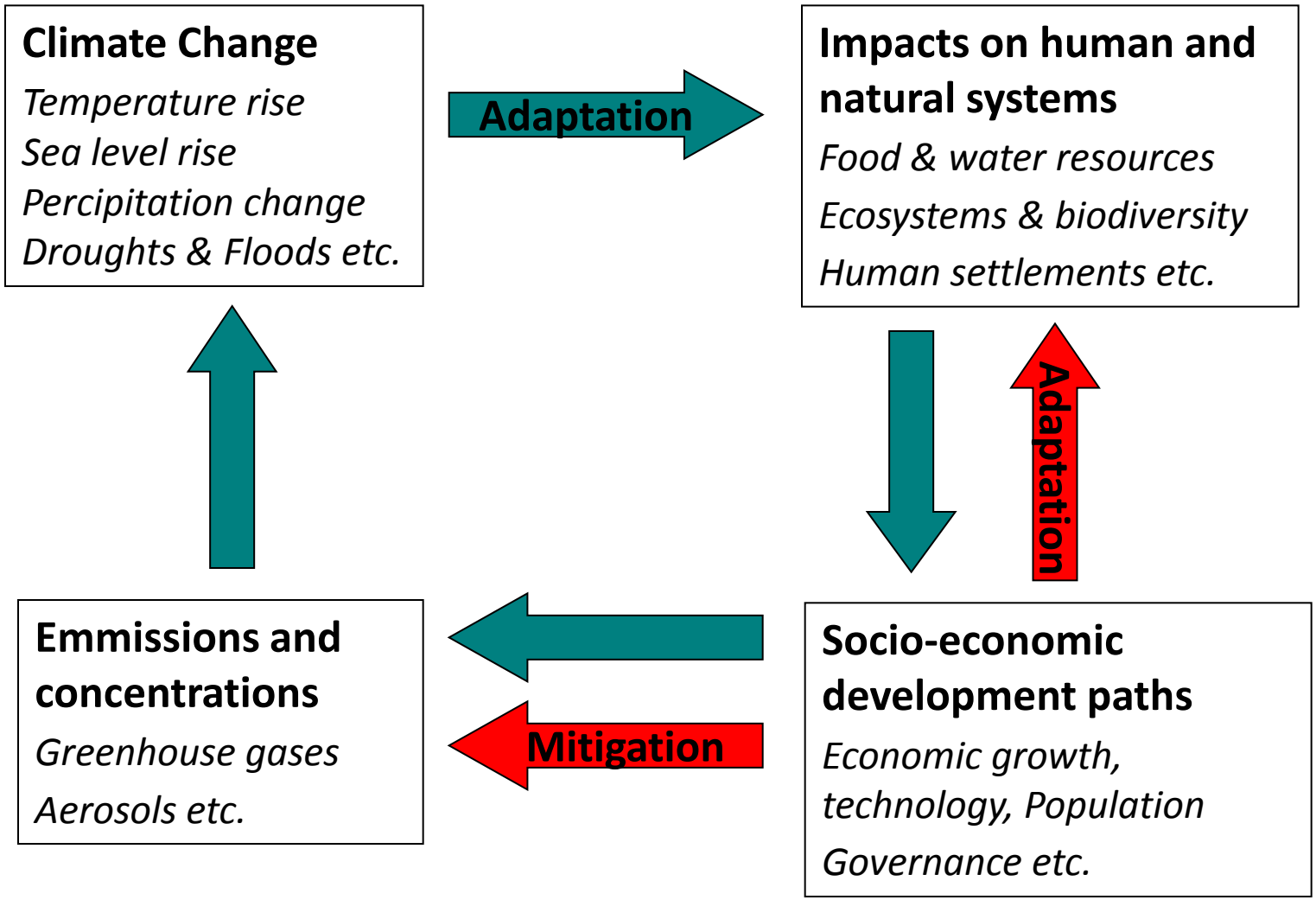
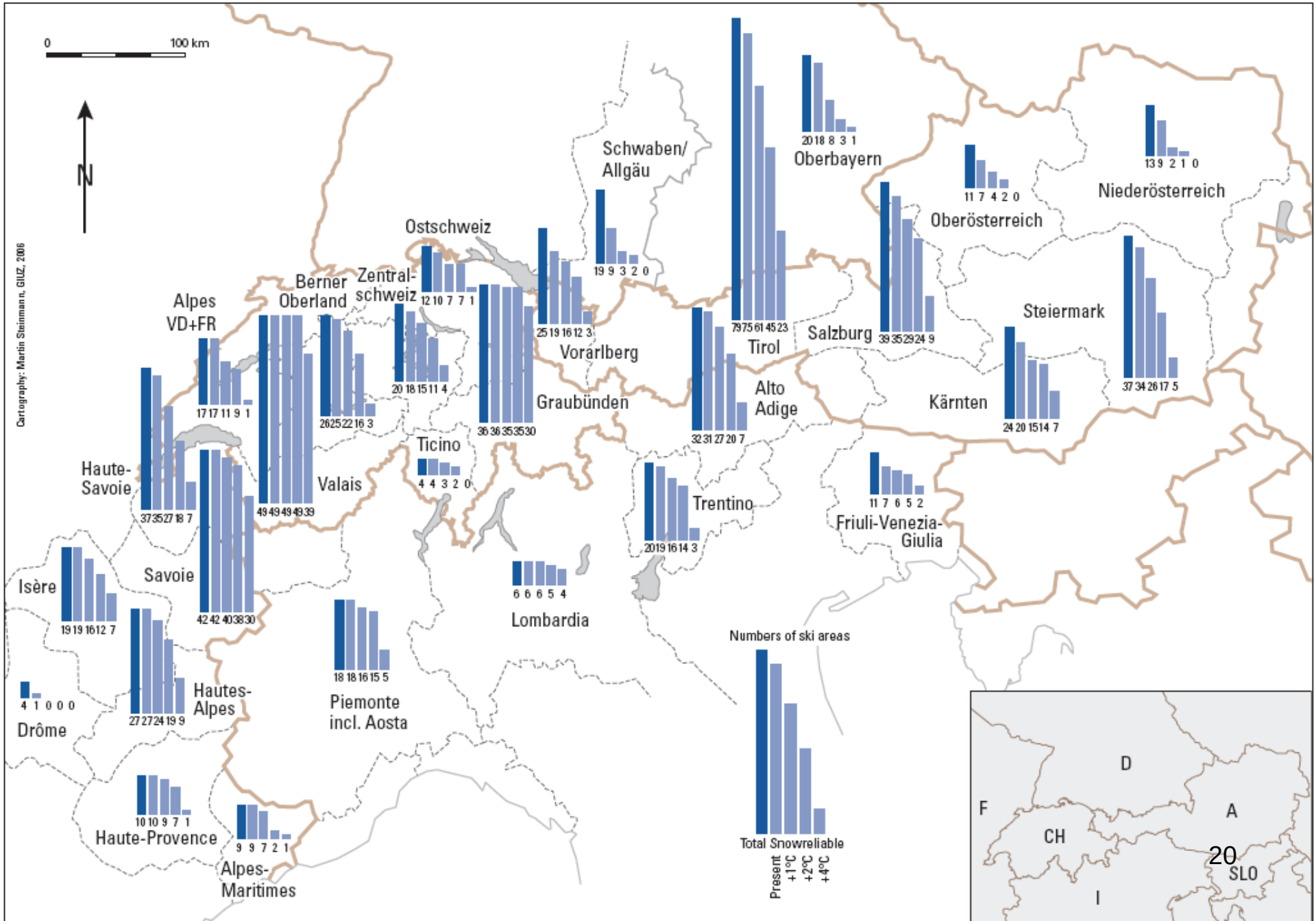
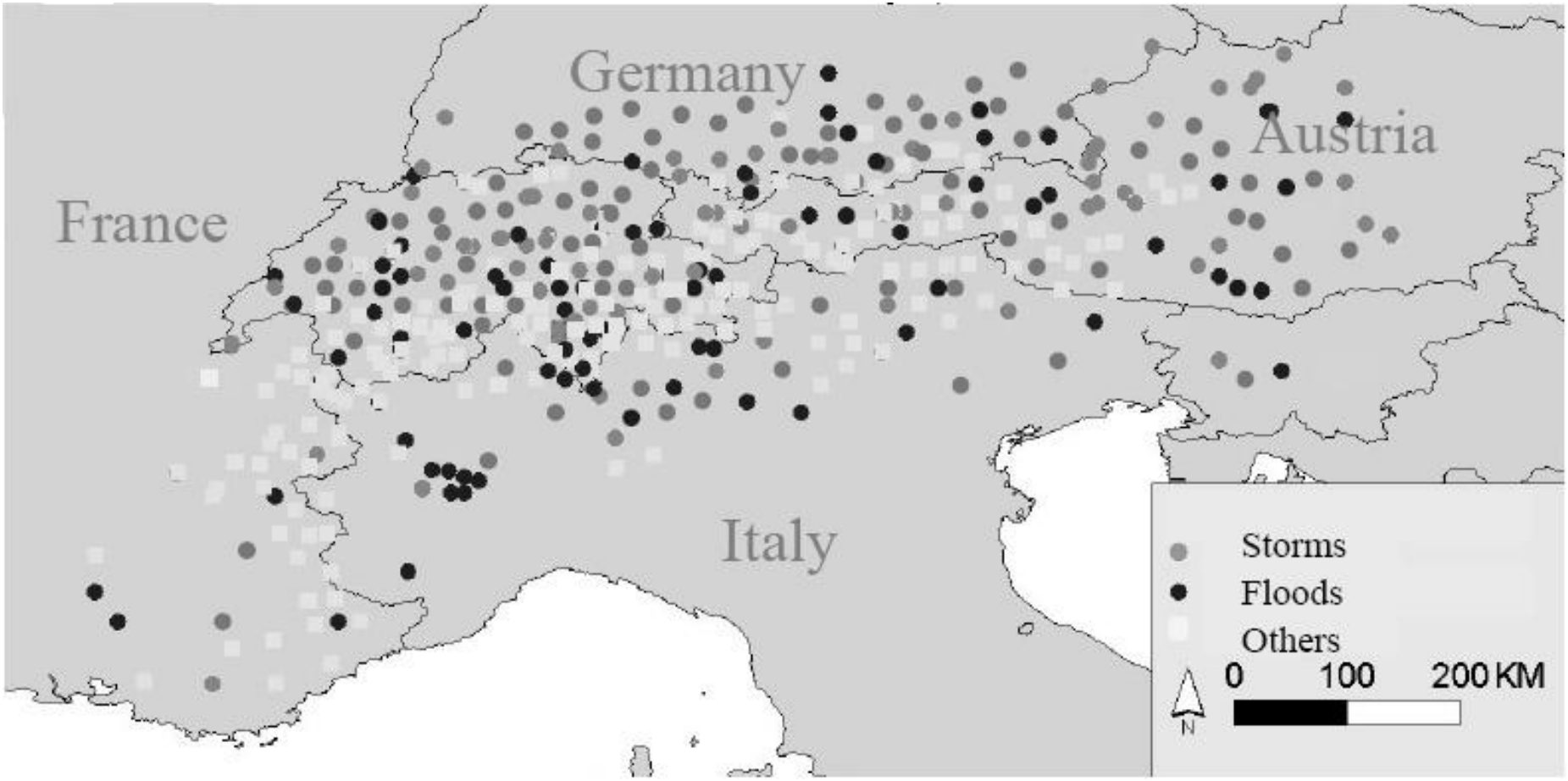

Climate Change
Temperature rise
Sea level rise
Percipitation change
Droughts & Floods etc.
Adaptation
Impacts on human and natural systems
Food & water resources
Ecosystems & biodiversity
Human settlements etc.
Adaptation
Emmissions and concentrations
Greenhouse gases
Aerosols etc.
Mitigation
Socio-economic development paths
Economic growth, technology, Population
Governance etc.

Snow-reliability of Alpine ski areas under current conditions and under 1, 2 and 4 °C warming



Disaster and loss events in the Alps, 1980-2005

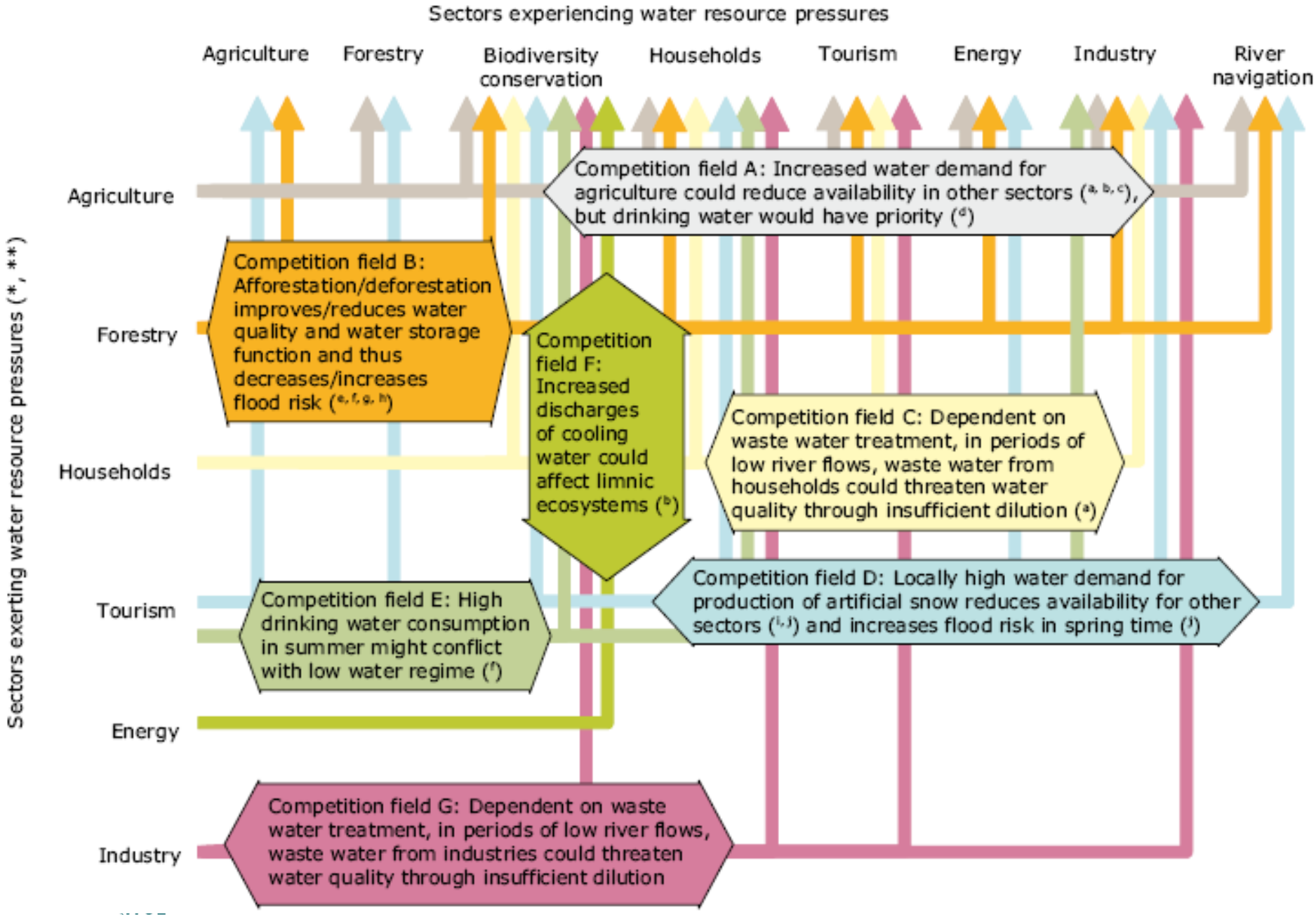


OECD 2007 (Modified from a document provided by Munich Re, Geo Risks Research © 01/2006 NatCatSERVICE ®)

Klimaanpassung von Städten, Gemeinden und Regionen

- Business as usual
- Prevent the loss
- Spread or share the loss
- Change the location
- Change the activity
- Enhance adaptive capacity

(C-CIARN Canadian Climate Impacts and Adaptation Research Network, 2006)


Sectors experiencing water resource pressures
Agriculture
Forestry
Biodiversity conservation
Households
Tourism
Energy
Industry
River navigation
Sectors exerting water resource pressures (*, **)
Agriculture
Forestry
Households
Tourism
Energy
Industry
Competition field A: Increased water demand for agriculture could reduce availability in other sectors (a, b, c), but drinking water would have priority (d)
Competition field B: Afforestation/deforestation improves/reduces water quality and water storage function and thus decreases/increases flood risk (e, f, g, h)
Competition field F: Increased discharges of cooling water could affect limnic ecosystems (b)
Competition field C: Dependent on waste water treatment, in periods of low river flows, waste water from households could threaten water quality through insufficient dilution (a)
Competition field D: Locally high water demand for production of artificial snow reduces availability for other sectors (i, j) and increases flood risk in spring time (j)
Competition field E: High drinking water consumption in summer might conflict with low water regime (f)
Competition field G: Dependent on waste water treatment, in periods of low river flows, waste water from industries could threaten water quality through insufficient dilution