RISKISNOWHERE

PRECAUTIONARY HANDLING OF **COMPOUND EVENTS** IN DANISH MUNICIPALITIES

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AGENDA

1. Research Problem & Point of Departure
2. What are ‘compound events’
3. Theoretical perspective
4. Case study & Methods
5. Results
6. Discussion – lets get meta
7. Summary
8. Q & A

1. RESEARCH PROBLEM AND POINT OF DEPARTURE

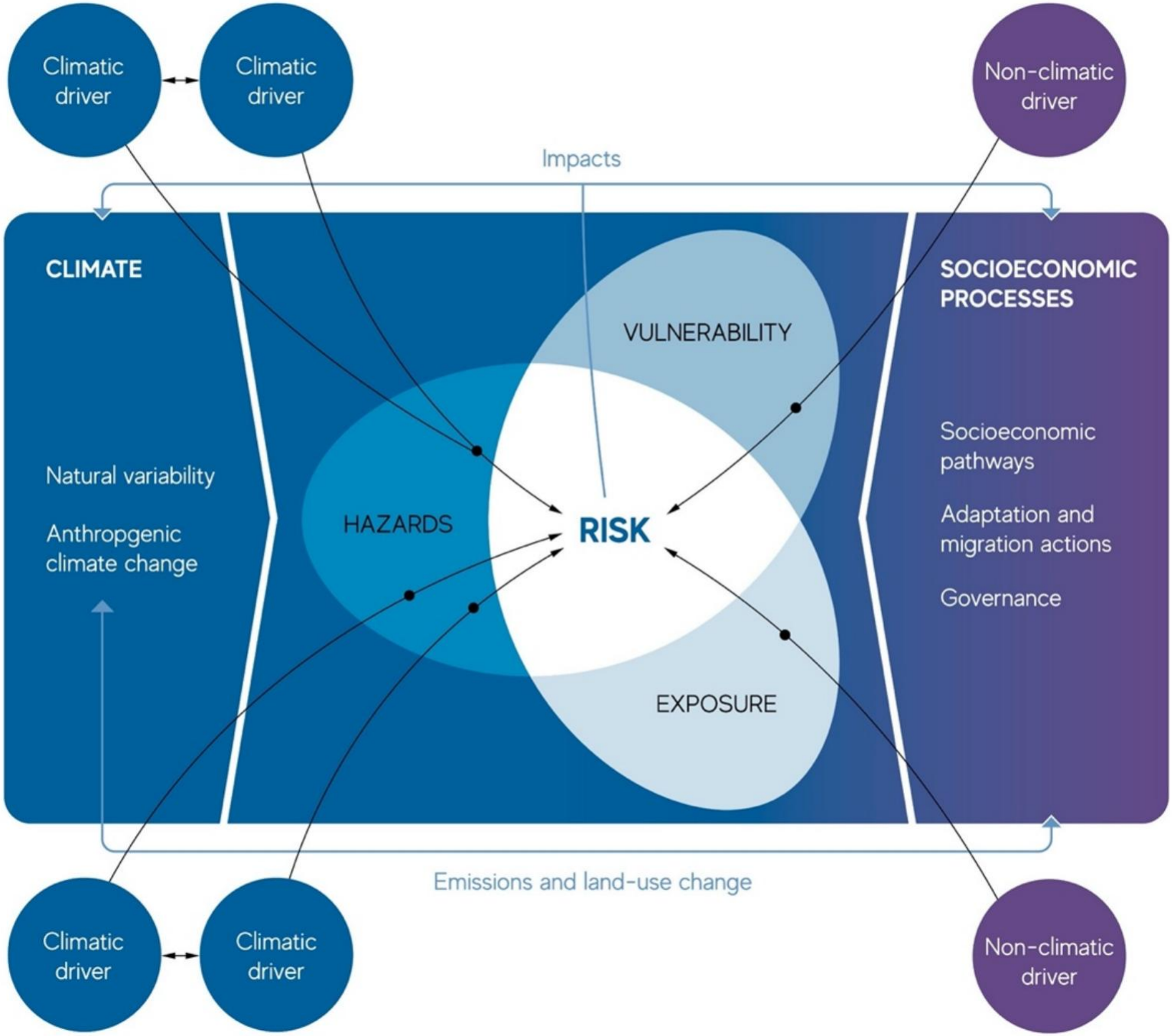
Dramatically increase of extreme weather events in the past 20 years > heavy human and economic toll worldwide (UN report, 2020)

- Uncertain dynamics of interacting natural drivers leading to extremes ('compound events')
- Underestimated risk of compound event
- Focus Denmark – Hvidovre, Odense, Vejle Kommuner

How and to what extent do specific municipalities in Denmark perceive the risk of compound events and adopt climate risk management tools to handle their vulnerabilities?

II. 'COMPOUND EVENTS'

Compound event are described as "an extreme impact that depends on multiple statistically dependent variables or events" (Leonard *et al.*, 2014:37)


Climatic driver
Climatic driver
Non-climatic driver
Impacts
CLIMATE
Natural variability
Anthropgenic climate change
HAZARDS
VULNERABILITY
RISK
EXPOSURE
SOCIOECONOMIC PROCESSES
Socioeconomic pathways
Adaptation and migration actions
Governance
Emissions and land-use change
Climatic driver
Climatic driver
Non-climatic driver

III. THEORETICAL PERSPECTIVES

RISK MANAGEMENT

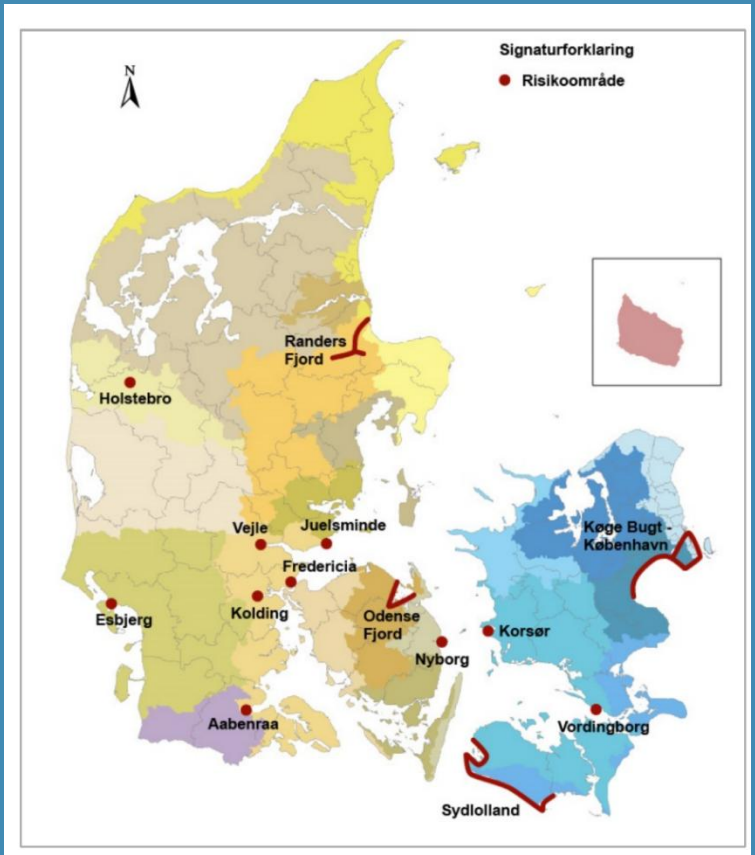
- Decision making strategy to reduce the "probability of a bad outcome and the potential severity of its consequences"
- Risk avoidance, acceptance, transfer, minimalization
- Forward-thinking technique
- Precautionary approach

Focus on the 'how', the practice

ORGANISATIONAL TOOLS

Nodality - Authority - Treasury - Organisation

IV. RESEARCH DESIGN



METHODS

- Critical realist stance: Combining the understandings of social & natural sciences
- Explorative case studies, 'paradigmatic sampling'
- Caste study **selection criteria**:
  - Paradigmatic sampling
  - Kommune which practices climate change adaptation & is frequently exposed to natural risk factors (flood risk)
  - Practical considerations (availability, willingness)
- **10 semi-structured expert** interviews, supplemented through document analysis
- Transcribed, coded, visualised with Atlas.ti

V. RESULTS

	Risk picture	Strategy	Tools	Needs
Hvidovre	Flood risk source: [3] Seawater, fluvial, cloudburst, groundwater. Vulnerability: Dense urbanisation	• Thematic management • Post-factum • Fact-based policy making > Risk minimalisation	• Research, information sharing • Stakeholder cooperation • External collabo-ration	Research on the combined effects, regularly updated knowledge sharing platform, and increased financial support.
Odense	Flood risk source:[4] Fjord, fluvial, cloudburst, groundwater. Vulnerability: Surprise through extreme events	• Collaborative approach • Ambitious protection standards indicating precaution > Risk acceptance	• Technical solutions • Stakeholder cooperation • internal 'climate ready' group	Data and research on the dependencies and increased financial support.
Vejle	Flood risk source:[5] Fjord, fluvial, cloudburst, groundwater. Vulnerability: Dense urbanisation	• Holistic approach • Extensive network and multiple planning approaches > Risk minimalisation & acceptance	• Technical solutions • Stakeholder cooperation • Emergency action team • Dynamic planning	Research on past incidents and more data for precise forecasts on a smaller local scale.

CASE 1: HVIDOVRE

Risk picture:
- Almost- event experience of compound event
- Vulnerable through dense population

Strategy:
- Thematic management
- Post-factum
- Fact-based policy making
- = Risk acceptance & minimalization

Tools:
- Research, information sharing
- Stakeholder cooperation
- External collaboration

Needs
- Research on the combined effects
- Regularly updated knowledge sharing platform
- Increased financial support

CASE II: ODENSE

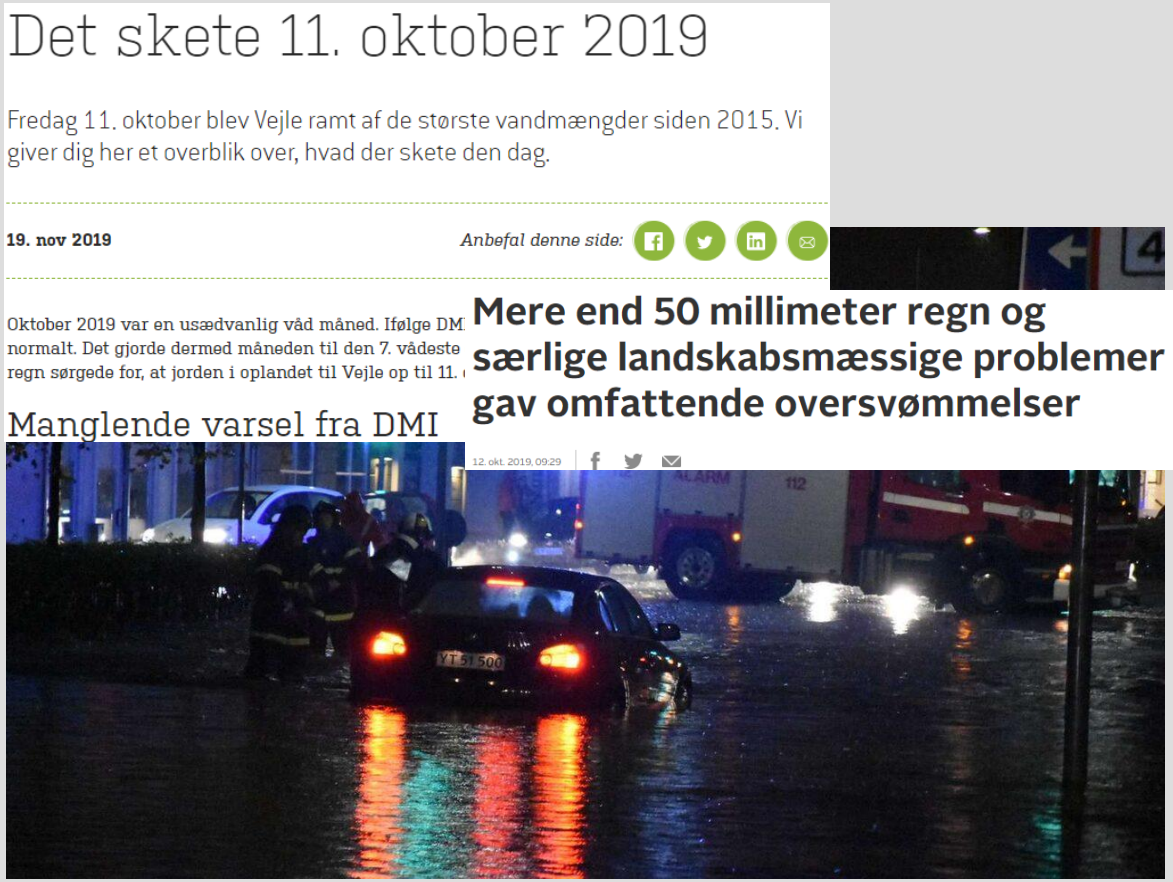
Risk picture:
- No concrete occurrence of compound events
- Vulnerable through single extreme events

Strategy:
- Collaborative approach
- Ambitious protection standards indicating precaution
- = Risk minimalization & acceptance

Tools:
- Technical solutions
- Stakeholder cooperation
- Internal 'climate' ready' group

Needs
- Data and research on the dependencies
- increased financial support

CASE III: VEJLE



Det skete 11. oktober 2019

Fredag 11. oktober blev Vejle ramt af de største vandmængder siden 2015. Vi giver dig her et overblik over, hvad der skete den dag.

19. nov 2019 Anbefal denne side:

Oktober 2019 var en usædvanlig våd måned. Ifølge DM
normalt. Det gjorde dermed måneden til den 7. vådeste
regn sørgede for, at jorden i oplandet til Vejle op til 11.

Manglende varsel fra DMI

Mere end 50 millimeter regn og særlige landskabsmæssige problemer gav omfattende oversvømmelser

12. okt. 2019, 09:29

Risk picture:

- Common occurrence of compound events
- Vulnerable through dens urbanisation

Strategy:

- Holistic approach
- Extensive network and multiple planning approaches
- = risk minimalization & acceptance

Tools:

- Technical solutions
- Stakeholder cooperation
- Emergency action team
- Dynamic planning

Needs

- Research on past incidents, more data for precise forecasts on a smaller local scale

VII. DISCUSSION

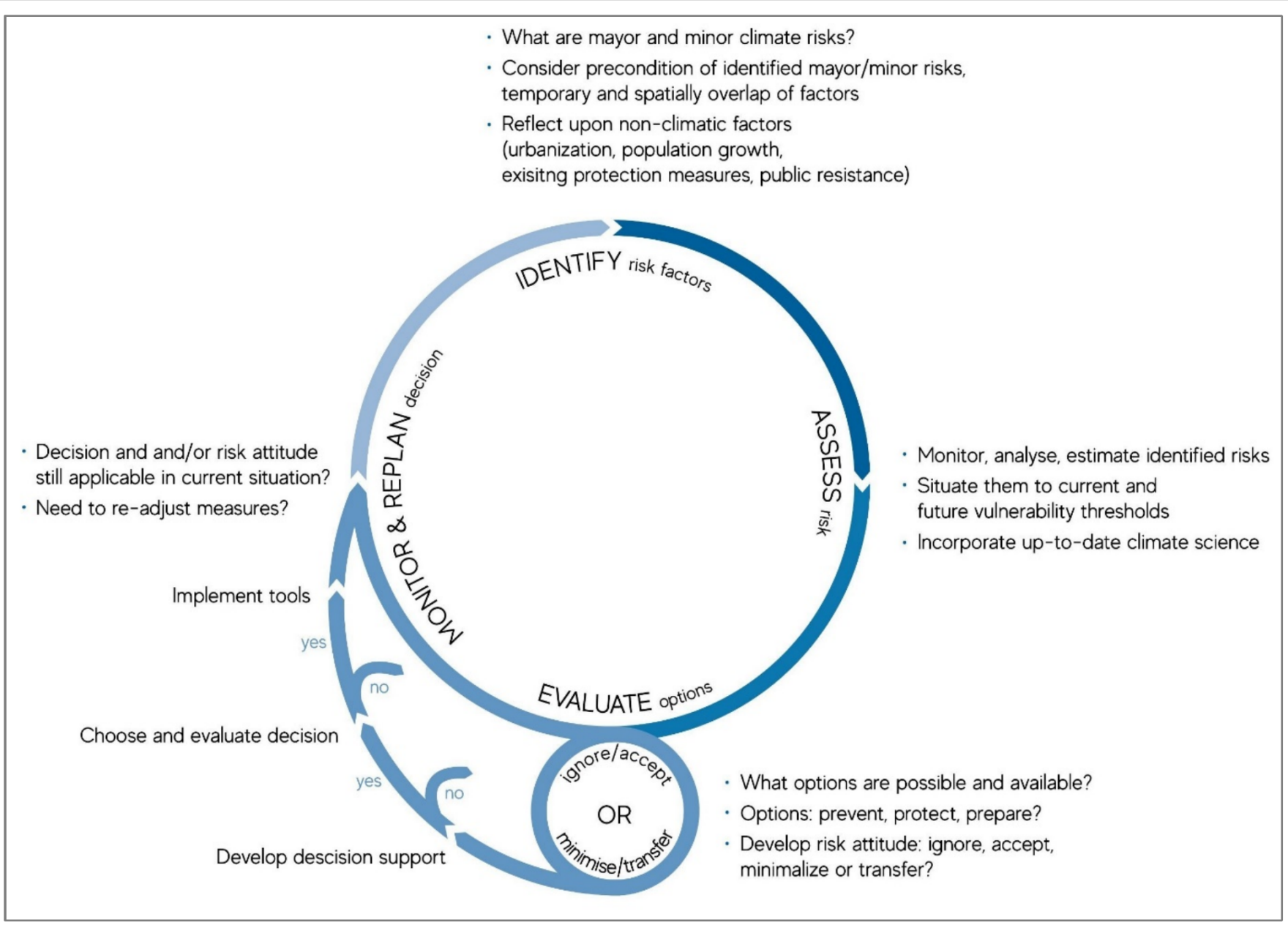
RESEARCH PROBLEM & FINDINGS

- Different understandings and measures
  - Treating this as a condition or situation
- Risk communication and involvement of stakeholder seen as important related climate issues
- Process of convincing mentioned often

RESEARCH & PRACTICE IMPLICATIONS

1. Legislative adaptation of multiple sources of (flood) risk, discussion of responsibility
2. Need of collaboration and out-of-the-box thinking for complex problems such as compound events
3. Increased collaboration between scientific disciplines, stakeholder focus on needs and expectations

ADAPTED RISK MANAGEMENT CYCLE



VIII. SUMMARY

- Risk of compound events is always influenced by both physical and social factors
- risk of compound events can be only conditionally be categorised as ‘underestimated’ > Kommuner partially have all taken precautions against it
- Fruitful to expanded the conceptual remit of what has been traditionally dominated by earth science methodologies to the sphere of social science practices and risk management

- RISK-IS-NOWHERE vs RISK-IS-NOW-HERE

THANKS FOR LISTENING

QUESTIONS?

RESEARCH DESIGN II

Nr.	Questions	Comment
1.	INTRODUCTION	
	- Intro to compound event research - Intro Luise, Masters and research - Ethical guidelines (anonymity, consent sheet)	5-7 min
2.	INTRODUCTION TO USER/ ORGANISATION	
	- Name (only if user consents to be named)? - Job title ((only if user consents to be asked)? - What are the primary tasks of your kommune/ organisation in relation to climate change risk management and climate adaption and what are your responsibilities?	3-5 min
3.	EXPERIENCE WITH CLIMATE CHANGE/WEATHER EVENTS	
	- What is your kommuner experience with extreme climate related events? What do you perceived as being the major hazard? - Has there been a visible compound effect in those events?	7 min
4.	APPROACH TO CLIMATE VULNERABILITY ASSESSMENT	
	- In what aspects and areas is your kommune vulnerable in relation to extreme climate/weather events? - Do you have any threshold of vulnerability level which guides your actions/decisions? - Risk acceptance?	5-7 min
5.	ORG ANISATION OF CLIMATE RISKS MANAGEMENT AND VULNERABILITY ANALSIS ON LOCAL LEVEL	
	- How is climate risk management integrated in local project management? (all departments? Integrated through climate change adaptation strategies?) - Do your kommune make more short term or longer-term planning strategies in relation to CC risk management? (Are decisions related to	7-10 min

Data collection

- 10 Expert Interviews
  over the period of Oct. – Nov. 2020
- Semi-structured
- Eight single and one group interview, online
- Supplemented document analysis

6.	MANAGEMENT TOOLS OF CLIMATE (COMPOUND) RISKS	

	- How do you execute climate adaption plans into climate risk management preparation towards CC/ weather extremes?
	  o Regulation/ guidelines which people have to follow? (creating authority and control)
	  o Financial distribution? (budget allocation power)
	  o Tool of creating information (normative power)?
	- What type of solutions are favoured (technical, citizen-based workshops, Awareness sharing, Scientific facts)?
	- What approach are you taking on CC risk management? *(Risk avoidance/reduction/sharing/acceptance?)*
		10-12 min

7.	KNOWLEDGE	
	- What information and skills are needed to be able to do current CC risk management? Are they present at your organisation?	5 min
8.	CHANGE	
	- Has there been a change in CC strategies following recent extreme weather events? - Do you see a need to re-structure existing policies in face of	7 min

RESEARCH DESIGN III

Analytical strategy:

- Data collection through interviews
- Interviews transcribed, coded, categorised
- Analysed with support programme Atlas.ti
- Visualisation procedure