

Flood hazard and climate change

A study of institutional change in the Civil protection system

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Background

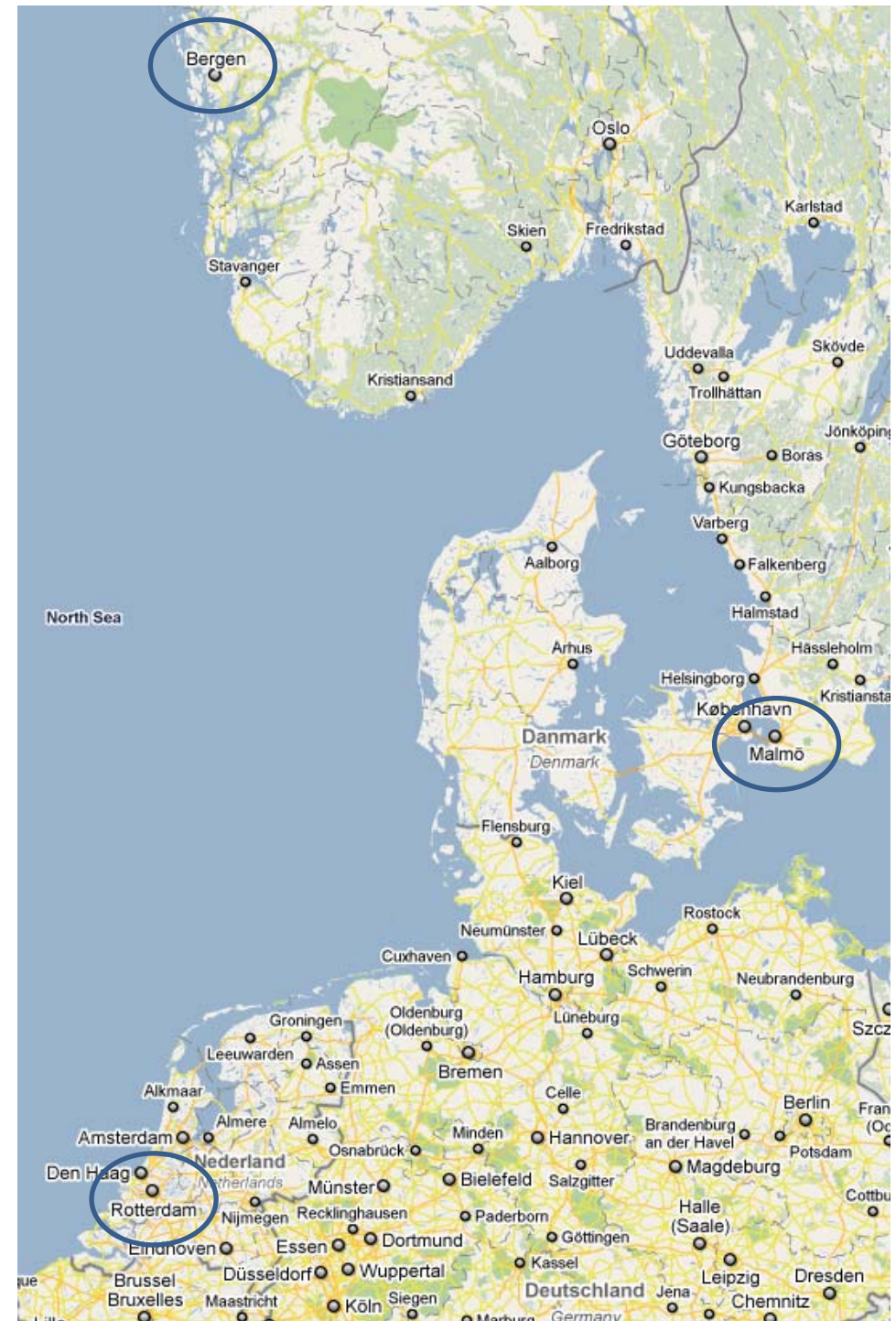
- The CIVILCLIM project (2008-2010) funded by the Research Council of Norway
- By examining approaches to extreme weather events in the near past, we seek insight into the conditions for long-term institutional learning in the effort to prevent damage caused by climate change.
- Partners
 - Vestlandsforskning, Norway (project leader)
 - FOI, Sweden
 - CSTM, University of Twente, the Netherlands
 - SINTEF / ProSus, Norway

Research questions

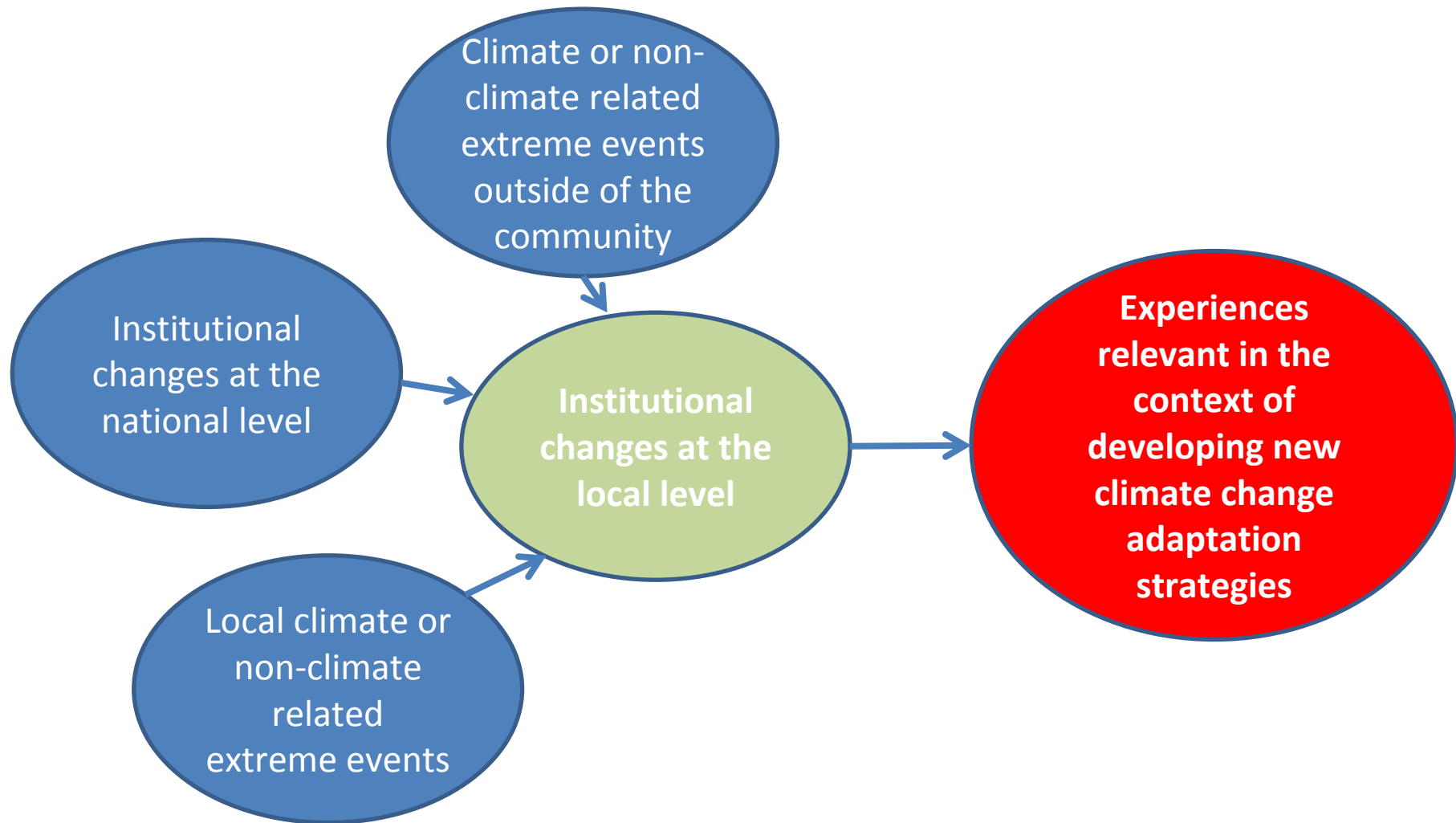
- What can we learn from the last decade's work within civil protection institutions on reducing vulnerability towards extreme weather events?
- How can this be of value for climate change adaptation?

The case cities and their water related vulnerabilities

- **Bergen** (260,000 inh.)
 - Extreme rainfall; rapid discharge increase in small rivers, urban flooding, landslides
 - Sea level rise, presently problems with storm surges
- **Malmö** (290,000 inh.)
 - Urban flooding
 - Sea level rise
- **Rotterdam** (603,000 inh.)
 - Riverine floodings (the Meuse)
 - Sea level rise



Analytical model



Typology on institutional change

Two dimensions: Type of change & Administrative level

TYPE OF CHANGE

- Changes in procedures
 - Legislation (national acts)
 - Planning instruments (formalized procedures)
- Changes in organisations
 - Changes within existing organisations
 - Establishing of new organisations
- Changes in practice
 - Assessments
 - Adaptation measures

Institutional changes identified

- Bergen
 - RVA mandatory part of spatial planning & building permit treatments (2007)
 - Water and sewage treatment plan in all developments (2007)
- Rotterdam
 - RCP, the adaptation program *Rotterdam Climate Proof*
- Malmö: ?

The Multiple Stream Model

(Kingdon 1995)

- **Problem stream:** People (experts) recognize problems
 - Indicator; Focusing event; Feedback from existing programs
- **Policy stream:** They generate proposals for public policy
 - 'The Policy primeval soup' where proposals are being worked out, discussed and amended
- **Politics stream:** They engage in political activities
 - The public mood; Pressure group campaigns; Election results

An **opportunity window** opens as the three streams converge (e.g. after a focusing event), a situation that **political entrepreneurs** can make use of

Bergen

- Problem stream
 - Land-use planning failed to cope with extreme weather related hazards (flooding, landslide, rockfalls).
 - Traditional surface water treatment and rapid growth would lead to overload of surfaces and sewage system.
- Policy stream: Two debates during the 2000's
 - Civil protection authorities at national and regional level advocated use of RVA in land-use planning. Focus on civil society a new role for downscaled civil protection institutions.
 - Since 1980, a local network for urban hydrology promoted modern principles for surface water treatment in Bergen. Specialists that kept their commitment alive 'also in the hard years'.

Bergen (cont.)

- Political stream
 - The problems got their political solution in the process leading to the municipal Master plan (passed June 2007)
- Opportunity window
 - The opportunity window was opened during two extreme weather events with loss of lives in 2005
 - 14 Sept 2005: Landslide, Hatlestad terrasse (3 killed); Flooding, the Nesttun river
 - 14 Nov 2005: Landslide , Hetlebakkvegen (1 killed)
 - The ground was prepared by two non climatic events
 - 19 Jan 2004: M.V. Rocknes ship accident (19 killed)
 - Autumn of 2004: Giardia epidemic, large parts of the population was infected
- Policy entrepreneurs
 - Commissioner Lisbeth Iversen: Reframed the natural hazards question into a climate change context when she came into power in 2007
 - Magnar Sekse, head of the Agency for water and sewage works since 2006 (after the Giardia epidemic) introduced the paradigm shift

Rotterdam

- Problem stream:
 - Increased cellar flooding
 - Rotterdam is situated in the lower parts of the country that are the most vulnerable to climate change, facing increased flooding risks from sea-level rise and higher river discharges (The National Adaptation Strategy, 2007)
 - There is a 'reasonably large chance' that 5,000 inhabitants may be affected by flooding (2005 Municipal Disaster Plan)
- Policy stream:
 - Increased focus on climate vulnerability
 - Rotterdam politicians concerned about the fact that new businesses are apparently avoiding Rotterdam because of its 'risky profile'

Rotterdam (cont.)

- Politics stream:
 - The process that led to the adaptation program Rotterdam Climate Proof (RCP) and establishing of the Climate Office in 2009
- Opportunity window:
 - Hurricane Katarina's impacts on New Orleans (Aug 2005) mentioned by
- Political entrepreneur
 - Green Party alderman responsible for the adaptation program Rotterdam Climate Proof