

# Climate change adaptation at the regional level in Norway: status quo and challenges

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Conference 8 – 10 nov 2010  
Stockholm



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# Introduction

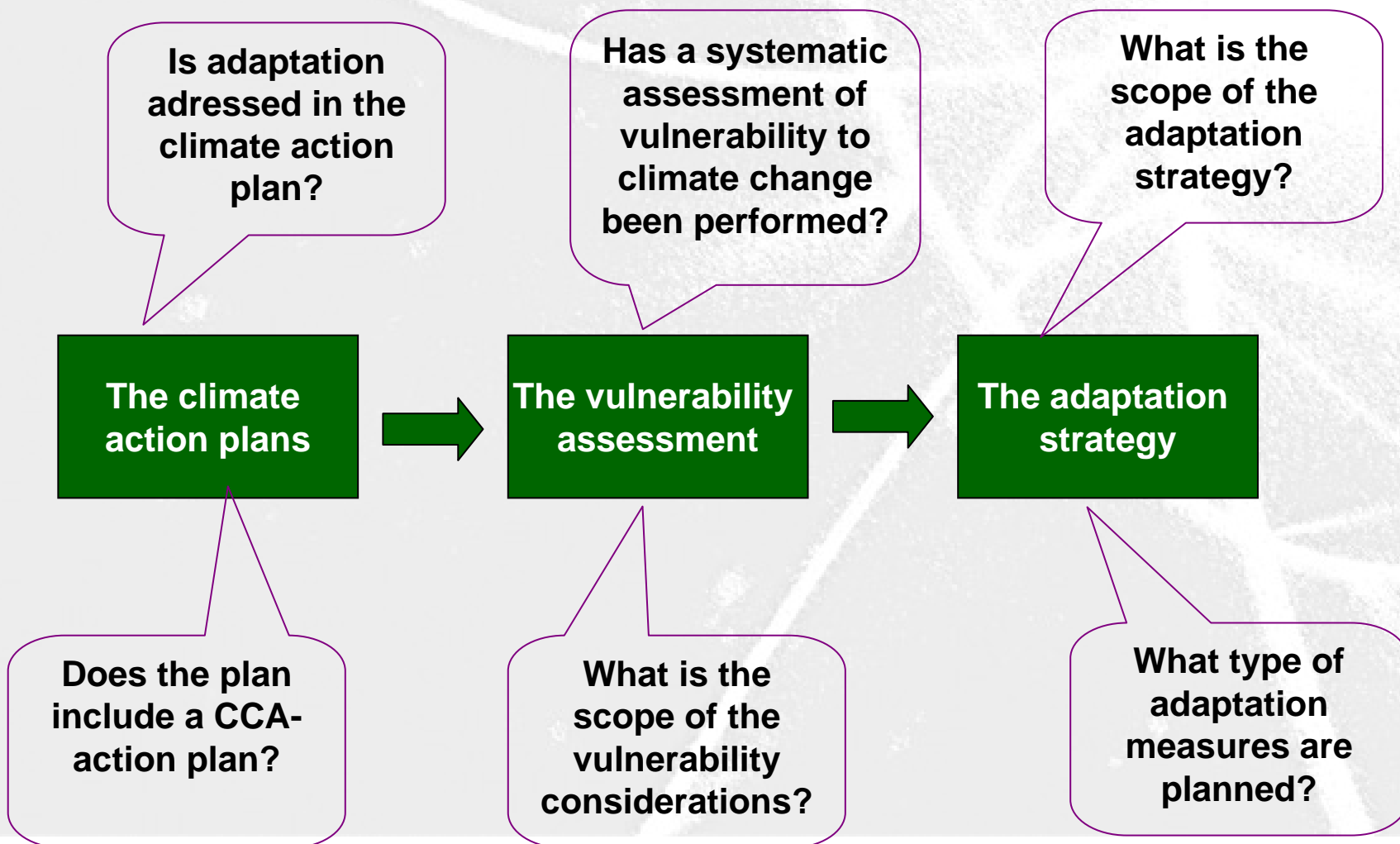
- **Content:**

- An analysis of the climate action plans of the Norwegian counties regarding adaptation to climate change (CCA-planning)

- **Context:**

- The counties are the regional level of government in Norway, with elected boards of representatives
  - 18 counties, 430 municipalities in Norway
- Adaptation (CCA-planning) was not on the national agenda in Norway until 2007
  - As opposed to mitigation (CCM-policy)
- The mitigation and the adaptation policy have until recently been handled by different government agencies
  - The pollution directorate: mitigation
  - The civil protection agency: adaptation
- The role of the regional level of government in CCA-policies has not been specified

# The analytical model



## Method

- **Analyzes of the county CCA-action plans**
  - Document-analyses
    - All county plans
  - Questions to all counties in e-mail
- **Typology used**
  - Developed through several WNRI- research projects
  - International litterature
- **The CCA-action plan of Sogn and Fjordane**
  - WNRI involvement in the process

# Climate action plans in Norwegian counties

- **With CCM-plan : 16 out of 18**
- **Without CCM-plan**
  - Finnmark
  - Telemark
- **With CCM-plan including CCA**
  - Sør-Trøndelag (2009)
  - Sogn og Fjordane (2009)
  - Hordaland (2010)
  - Rogaland (2010)
  - Akerhus(2010)
  - (Østfold) (2009)



# The CCA in the action plans

- The CCA-part of the plan is a small addition to the CCM-action plan (1- 6 pages)
- The CCA part of the plan equals the CCM-part (40 pages)

Østfold

Sør-Trøndelag

Sogn og Fjordane

Hordaland

Rogaland

Akershus

With short description of CCA-challenges in general plan

With description of CCA-challenges

+ CCA-objectives

+ CCA-action plan

# The vulnerability assessments

- **A regional vulnerability analysis has been carried out:**
  - An assessment or RAV-carried out by the county administration
    - None
  - An assessment carried out by research-institutions
    - Akershus
  - A recent regional risk and vulnerability assessment exists
    - Sør-Trøndelag
    - Sogn og Fjordane
    - Hordaland
- **No assessment is referred to:**
  - Rogaland
  - Østfold

# The scope of the vulnerability considerations

	Direct effects	Indirect effects
Effects due to changes in nature	<p><b>Effects of local climate change</b></p> <ol style="list-style-type: none"><li>1. The effect of incidents (e.g. floods, avalanches etc)</li><li>2. Long term, gradually developing effects (e.g. biodiversity, sea level rise)</li></ol>	<p><b>Effects of global climate change</b></p> <p>(e.g vulnerability to a globally insufficient food production)</p>
Effects due to changes in society	<p><b>Effects of societal change</b></p> <p>(e.g urbanisation causing increased vulnerability to flooding)</p>	<p><b>Effects of climate policy</b></p> <p>(e.g vulnerability due to more expensive fuels)</p>



# The scope of the vulnerability considerations

	Direct effects	Indirect effects
Effects due to changes in nature	<p><b>Effects of local climate change</b></p> <p>The main focus of all 6 plans.</p> <p><i>Long term changes: 4 plans.</i></p> <p><i>The effects of sea-level rise on society (4)</i></p> <p><i>Concern for biodiversity (3) and landscape (2)</i></p>	<p><b>Effects of global climate change</b></p> <p>2 plans</p> <p><i>food production (2),</i></p> <p><i>Climate refugees (1)</i></p>
Effects due to changes in society	<p><b>Effects of societal change</b></p> <p>3 plans</p> <p><i>The effects of urbanisation and concentrated urban development</i></p>	<p><b>Effects of climate policy</b></p> <p>1 plan</p> <p><i>The effect of increased fuel prices on transportation</i></p>

# Approach to CCA: The adaptation strategy

- **Has the adaptation strategy or measures been considered or discussed in relation to mitigation?**
  - To reduce the risk of maladaptation
- **Results:**
- **CCA-strategies and measures are discussed isolated from CCM strategies and measures**
- **Even in the Sogn og Fjordane action plan, which boast a balance between CCA and CCM goals and measures, the two subjects are poorly integrated**
  - Although the plan points to the fact that the two sides are connected
- **Only in one plan (Hordaland) do we find a few examples of integrated discussion**

## The other side of the coin: The CCM-measures

- **Has mitigation strategies or measures been considered or discussed in relation to vulnerability to climate change or adaptation?**
  - To reduce the risk of increasing vulnerability to climate change as a result of mitigation measures
- **Results:**
- **CCM-strategies are discussed isolated from CCA strategies and measures**
- **Examples: Recommending concentrated urban development, but not mentioning increased vulnerability to flooding (Rogaland, Østfold).**

## Approach to CCA: The type of adaptation measures

<b>Develop knowledge on vulnerability to climate change</b>	<b>E.g. Make a systematic vulnerability assessment</b>
<b>Strengthen institutional capacity</b>	<b>E.g. Administrative competence and capacity</b>
<b>Provide information</b>	<b>E.g. Measures to inform the public</b>
<b>Effect-oriented actions</b>	<b>E.g. Build flood protection</b>
<b>Cause-oriented actions</b> <i>(focus on changing society)</i>	<b>E.g. Restrict development in areas prone to flood risk</b>

## Results : The approach to CCA: Adaptation measures

<b>Develop knowledge on vulnerability</b>	<b>High priority, several plans and assessments:3</b> <b>(Akershus, Sogn og Fjordane, Hordaland)</b> <b>Municipal RAVs:2</b> <b>(Rogaland, Østfold)</b>	<b>5</b>
<b>Strengthen institutional capacity</b>	<b>High priority, several measures: 2</b> <b>(Akershus, Sogn og Fjordane)</b> <b>Some measures:1</b> <b>(Rogaland)</b>	<b>3</b>
<b>Provide information</b>	<b>Priority, several initiatives: 2</b> <b>(Hordaland, Sogn og Fjordane)</b>  <i>E.g. A guide on climate adaptation in existing and new buildings based on local building tradition,</i>	<b>2</b>

# Results: The approach to CCA: Adaptation measures

<b>Effect-oriented actions</b>	<b>High priority, several measures: (Hordaland)</b> Some measures: Sogn og Fjordane, Rogaland  <i>E.g. Secure all public buildings and infrastructure from negative effects due to climate change before 2013</i>	<b>3</b>
<b>Cause-oriented actions</b>	<b>High priority, several measures: (Sogn og Fjordane, Hordaland)</b>  <i>E.g.: Spare agricultural land from development New deveopment only in areas with no known risk due to climate change</i>	<b>2</b>

No actions: Akershus, Østfold

# The Sogn og Fjordane CCA-action plan

- **The only regional climate actions plan that address adaptation to climate change with the same effort as mitigation.**
- **The process was initiated in 2007 and is characterized by:**
  - an open process involving a large number of stakeholders,
  - using the Western Norwegian Research Institute as a consultant throughout the process.
- **The climate plan includes the following elements:**
  - 1) an assessment of the GHG emissions deriving from the production of goods and services within the county borders;
  - 2) assessment of the GHG emissions deriving from consumption by inhabitants of the county;
  - 3) an assessment of the regional climate change vulnerability regarding the following issues: Biodiversity, landscape, farming, forestry, fish farming, transportation, buildings, other physical infrastructure, hydroelectric power production, sea level rise;
  - 4) suggestions on goals, strategies and means to reduce GHG emissions relating to production and consumption;
  - 5) suggestions on goals, strategies and means for adaptation to climate change.

# Concluding remarks

- **CCA need to be developed as an issue in public planning at the regional level of government in Norway**
  - Almost all the counties in Norway have an updated CCM plan, but very few have included adaptation in their climate action plans.
  - The few existing CCA-action plans focus on developing more knowledge on vulnerability and strengthen institutional capacity and fail to go into detail on adaptation measures.
- **Mitigation and adaptation should be better integrated in future climate action plans to avoid maladaptation and increased vulnerability as a result of mitigation measures.**
  - Very few examples exist on exploring the possible interactions between CCM and CCA policies in the county plans
  - CCA is either not handled at all, or CCM strategies tend to be discussed isolated from CCA strategies and vice versa.
  - Several examples are found of mitigation strategies that are likely to influence vulnerability to climate change. The possible implications of such strategies for CCA are, however, not discussed.



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