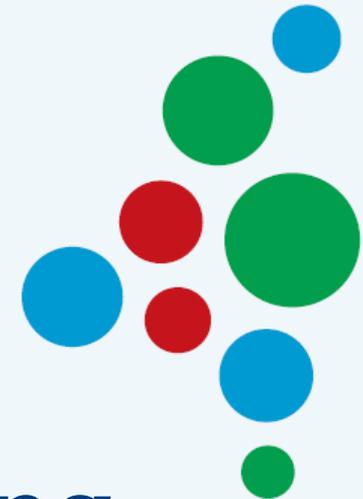


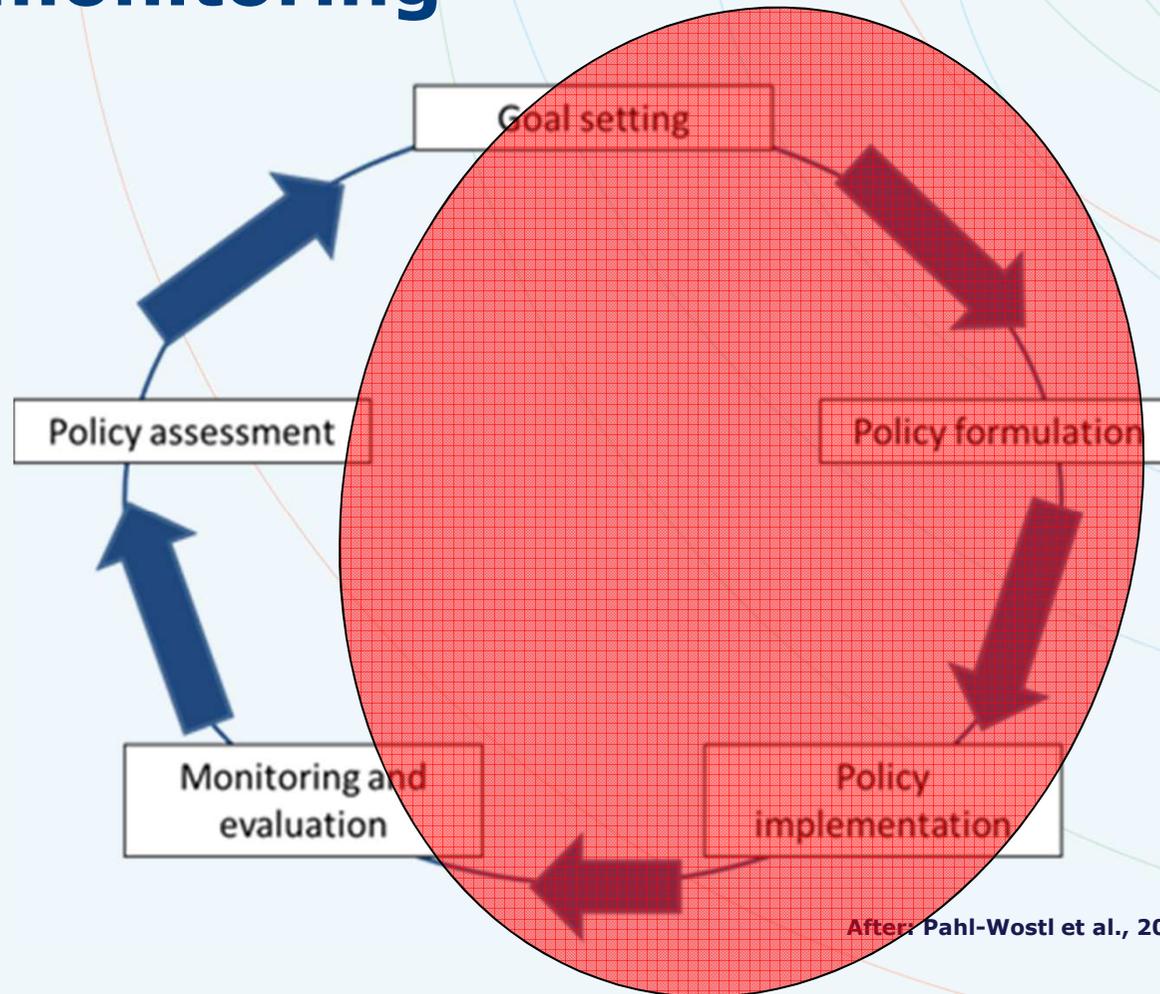
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# **Framework for monitoring adaptation policies**

**Kaj van de Sandt, Jelle van Minnen, Leendert van Bree, Nico  
Pieterse and Judith Klostermann**

# Why monitoring



After: Pahl-Wostl et al., 2007



## Monitoring objectives

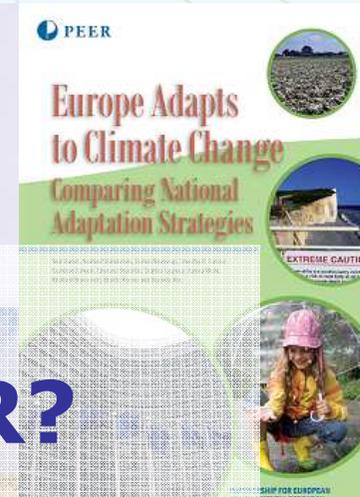
- Provide information on accountability requests at different administrative scales (global, European, national, regional), et

### **In general it comes down to:**

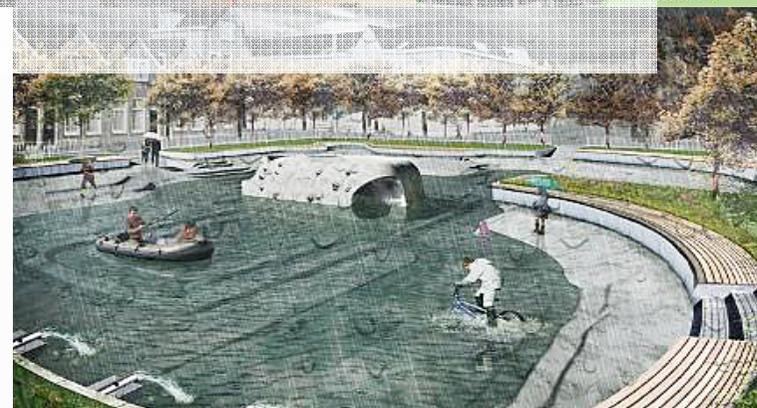
- 1) accountability**
- 2) learning**

- Check on progress and effectiveness
- Improve scientific knowledge
- Share information on good practise
- Ensuring equity
- Etc.

# Adaptation initiatives are unique



## HOW TO MONITOR?



Sources: [www.zuid-holland.nl](http://www.zuid-holland.nl); [www.deltacommissie.com](http://www.deltacommissie.com) ; [www.ceh.ac.uk](http://www.ceh.ac.uk); [www.klimaatonderzoeknederland.nl](http://www.klimaatonderzoeknederland.nl); [www.rotterdamclimateinitiative.nl](http://www.rotterdamclimateinitiative.nl) )

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## Monitoring ...

- contributes to policy learning and improve policies and measures;
- Provides data for accountability on governmental spending
- Should eventually lead to efficient and effective policies

# Monitoring framework



Building blocks	Description
1. Monitoring organization	The institution/organisation responsible for data collection
2. System of interest	Description of the adaptation context, information needs and monitoring objectives
3. Selection of indicators	Selection of available and smart indicators
4. Monitoring procedures	Procedures with regard to data collection, management, analyses and reporting Procedures with regard to stakeholders involvement

# Application of monitoring framework in three countries



We developed a framework to analyse existing monitoring strategies or monitoring strategies under development and try to develop the framework so it can assist the development of monitoring programmes in the future



# Monitoring framework



<b>Building blocks</b>	<b>Analyses</b>
1. Monitoring organisation	<ul style="list-style-type: none"><li>- Dependency</li><li>- Resources</li><li>- Stakeholder involvement/acceptance</li></ul>

# Monitoring framework



<b>Building blocks</b>	<b>Analyses</b>
<p>2. System of interest</p> <p>Description of the adaptation context, adaptation goals, information needs and monitoring objectives</p>	<ul style="list-style-type: none"><li>- Scientific analyses of current and future climate</li><li>- Scientific analyses of key elements like exposure, sensitivity, vulnerability and impacts</li><li>- Adaptation goal and actions</li><li>- Description scales</li><li>- Information needs and monitoring objectives</li></ul>

# Monitoring framework



<b>Building blocks</b>	<b>Analyses</b>
<p>3. Selection of indicators</p> <p>Selection of available and smart indicators</p>	<ul style="list-style-type: none"><li>- Type of indicators</li><li>- Use of existing indicators</li></ul>



## Type of process-based indicators

- **Adaptation response indicators** distinguishing both the development of adaptation policies and the delivery of adaptation action
- **Adaptive capacity indicators** measure the adaptive capacity of society and involved institution
- **Mainstreaming indicators** measure policy integration



## Type of outcome-based indicators

- **Climate exposure indicators** measure climate change and exposure
- **Climate sensitivity indicators** measure the influence of non climatic drivers on climate sensitivity
- **Climate impact indicators** measure the effect of climate change on the environment or social-economic system
- **Adaptation impact indicators** measure the impact of adaptation action on the social, economic and ecologic system

# Monitoring framework



## Building blocks

### 4. Monitoring procedures

Procedures with regard to data collection, management, analyses and reporting

Procedures with regard to stakeholders involvement

## Analyses

- Description of procedures
- References to external data sources
- Process on stakeholder involvement

# Results – monitoring organisation



	<b>Finland</b>	<b>UK</b>	<b>Germany</b>
Monitoring organisation	Coordination group for Adaptation to Climate Change	Adaptation Sub-Committee (ASC)	Existing Monitoring organisations
Dependency	Depended	Independent	Not available
Resources	Human resources available, no insight in financial resources	Human and financial resources made available by legislation	Not available
Stakeholder acceptance	Involved	Not involved	Not available



# Results – Building up a set of indicators in Finland (I)

## Information need

- Progress made climate adaptation development and action in different sectors of the NAS

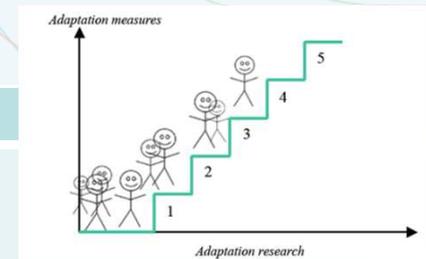
## Indicator used – level of Adaptation

- 1) Action taken
- 2) Research in place
- 3) Cooperation between sectors
- 4) recognition adaptation need

# Results – Building up a set of indicators in Finland (II)



Level of adaptation	Characteristics
<b>Step 1</b>	<ul style="list-style-type: none"> <li>• Need of adaptation recognized among a group of pioneers in the sector</li> <li>• Little research done on the impacts of or adaptation to climate change</li> <li>• Some adaptation measures identified but not yet implemented</li> </ul>
<b>Step 2</b>	<ul style="list-style-type: none"> <li>• Need for adaptation measures recognized to some extent in the sector (some decision makers)</li> <li>• Impacts of climate change known indicatively (qualitative information), taking account of the uncertainty involved in climate scenarios</li> <li>• Adaptation measures identified and plans made for their implementation, some of them launched</li> </ul>
<b>Step 3</b>	<ul style="list-style-type: none"> <li>• Need for adaptation measures quite well recognized (majority of decision makers) in the sector</li> <li>• Impacts of climate change quite well known (quantitative information), taking account of the uncertainty involved in climate scenarios</li> <li>• Adaptation measures identified and their implementation launched</li> <li>• Cross-sectoral cooperation on adaptation measures started</li> </ul>
<b>Step 4</b>	<ul style="list-style-type: none"> <li>• Need for adaptation measures widely recognized and accepted in the sector</li> <li>• Adaptation incorporated into regular decision-making processes</li> <li>• Impacts of climate change well known, within the limits of the uncertainty involved in climate scenarios</li> <li>• Implementation of adaptation measures widely launched and their benefits assessed at least to some extent</li> <li>• Cross-sectoral adaptation measures an established practice</li> </ul>
<b>Step 5</b>	<ul style="list-style-type: none"> <li>• Adaptation measures under the Adaptation Strategy or recognized otherwise implemented in the sector</li> </ul>



Source: ministry of agriculture and forestry, 2009

# Results – Building up a set of indicators in the UK (I)



## Information needs/monitoring objective

- Assess progress of adaptation
- Deliver information for the development of UK's national adaptation Programme

## Use of indicators

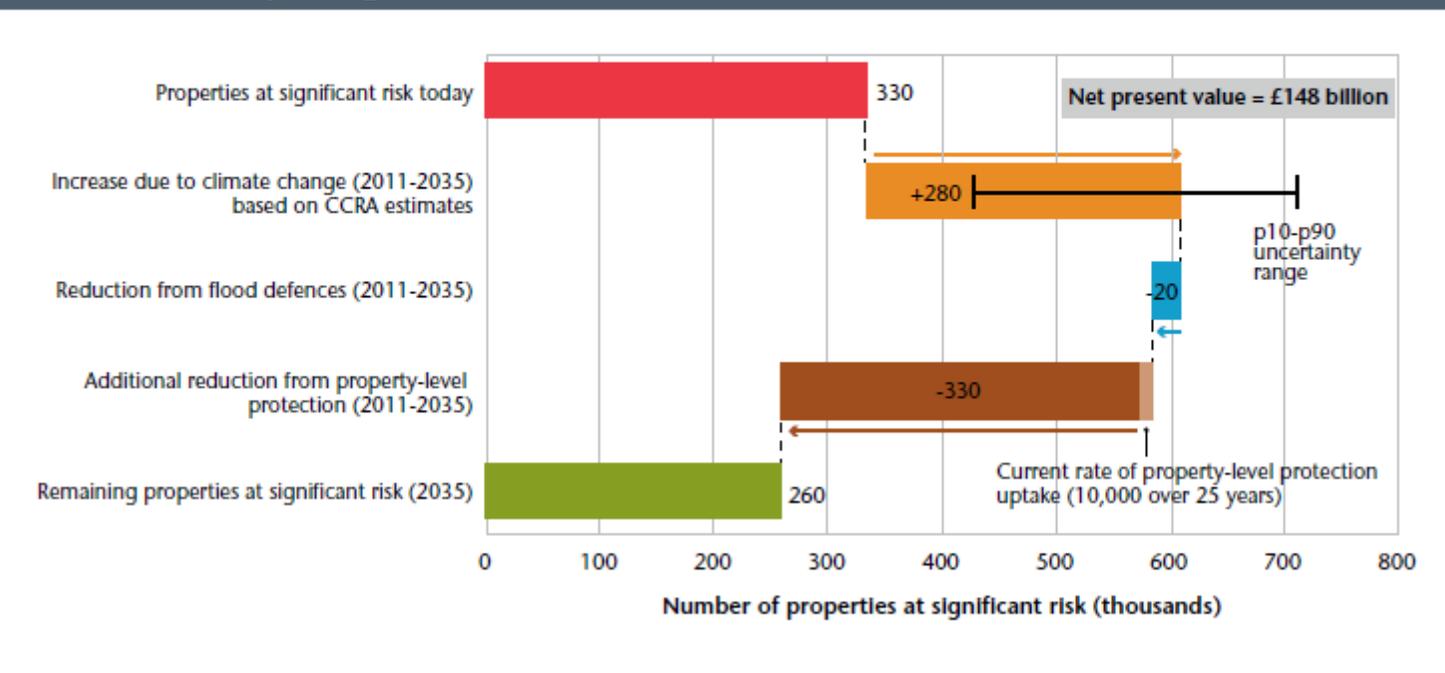
- Wide range of indicators used
  - Delivery of adaptation action
  - Barriers for adaptation
  - Can institutions deal with long term climate impacts
  - Climate system, sensitivity, impacts, adaptation responses

# Results – Building up a set of indicators in the UK (II)



Figure 2.7: Combined effect of climate change, varying levels of flood defence investment and take-up of property-level protection by all properties where it is cost-beneficial to do so on the number of properties in the significant risk category in 2035.

(a) Flood defence spending constrained to 2008/09 cash level (Investment Scenario A)



Source: ASC, 2012



# Results – Building a set of indicators in Germany (I)

## Information needs/monitoring objective

- document long term climate impact monitoring
- Illustrate impacts with concrete data
- use for progress review measures
- supply the policy process with essential and robust data
- evaluate adaptation measures

## Use of indicators

- Both process-based as outcome-based indicators
- Key indicators for different adaptation action fields, to be selected from existing data

# Results – Building a set of indicators in Germany (II)



Indicator field	Impact/ response	Description	prioritized
<b>Coefficient of run-off</b>	Impact	<ol style="list-style-type: none"> <li>1) Changes in the mean coefficient of run-off and seasonal run-off distribution</li> <li>2) Clustering of an increase in extreme run-off events</li> <li>3) Accelerated glacier shrinking with impacts on water management downstream</li> </ol>	Yes
<b>Sea level and sea currents</b>	Impact	<ol style="list-style-type: none"> <li>1) Sea level rise</li> <li>2) Changes in current conditions and in tide dynamics</li> </ol>	Yes
<b>Protection systems for coasts and related infrastructure</b>	Impact	<ol style="list-style-type: none"> <li>1) Overloading drainage systems in low-lying marshy areas</li> <li>2) Increased loads on/failure of coastal protection systems</li> <li>3) Damage to/destruction of coastal settlements and infrastructure</li> </ol>	Yes
<b>Communicating to inhabitants regarding risks and hazards</b>	Response	<ol style="list-style-type: none"> <li>1) Education</li> <li>2) Develop early warning systems and information services</li> </ol>	No

Source: Umweltbundesamt in 2010

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# Conclusions



- Framework can be used to analyse monitoring systems
- Monitoring programmes differ between countries as a result of diversity between adaptation context and cultural and political differences
- All monitoring systems aim to measure both adaptation processes and outcomes.
- The UK has the most elaborated monitoring system at the moment