Examples of Vulnerability Assessment Aggregation
Results from other Regions

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Advantages
- presents a large amount of information in a simplified and visually attractive manner
- Maps summarise and synthesise information in a way to be useful for policy decisions

Disadvantages
- Uncertainties in the data and important analytical assumptions may be hidden from the user
- Impediments with data availability and accuracy, methodological issues and other issues that arise in any assessment process

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Purposes vary according to the specific study, however, generally intended to have the same objectives:
- to identify areas at potentially high risk of climate impacts - so-called climate change “hotspots” and
- to identify planning and capacity building needs or
- to better target funding and adaptation programs

There is as yet no consensus on what constitutes “best practise” in spatial Vulnerability Assessments

Over recent years the number of spatial VAs increased; conceptualisations, methods, and data used to assess vulnerability multiplied

All of the commonly used methodologies have their strengths and weaknesses

Example 1: Regional Climate Change Programme: Southern Africa

Aim: Explore where current and future climate stressors have the greatest impact within the SADC region, and how adaptive capacity could shape the vulnerability of communities - “Hotspot” analysis

Method:
- Indicator based. For current situation (2008) and future (2050), weighting
- Weighted overlay of indicators for each component
- Weightings from 1 to 3
- Classification on a scale from 1 to 9 (using Jenks classification or logarithmic)
- Exposure (8) and Sensitivity (23) indicators combined to single layer representing Impact of climate related stressors. Then combining this with values from Adaptive Capacity (12) analysis to get vulnerability Hotspots
- Smoothing analysis to calculate average values for the data within a search radius of 50km, to identify locations for centres of hotspots
Examples from other Regions (1 cont’d)


Vulnerability values range from 1 to 10, where 1 is low (blue) and 10 is high (red)


Values range from 1 to 10, where 1 is low (blue) and 10 is high (red)
Comparision between the hotspot areas for current (2008) and future (2015) conditions


Values range from 1 to 10, where 1 is low (blue) and 10 is high (red)

Principal Component Analysis (PCA)

Example 2: Burundi

- **Aim:** Identification of climate change “hotspots” to target funding and adaptation programs
- **Spatial scale:** national and local
- **VA carried out for three Vulnerabilities:** Malaria, Erosion and Drought
- **Method:** Vulnerability composed of exposure, sensitivity and adaptive capacity. Process: workshops in country to develop impact chains, define indicators and weights
- **Data:** Climate projections at 25km resolution for two time periods in the future for RCP 4.5 and 8.5 (raster), Sensitivity indicators (vector) mostly on municipality level, Adaptive Capacity indicators (vector) on provincial level
- **Classification:** Vulnerabilities ranged from 1 to 5 (displayed on maps as stretched colour scheme)
Examples from other Regions (2 cont’d)

1. Carte de vulnérabilité à la sécheresse au Burundi (2071-2099)
2. Modèle de disponibilité d’eau
3. Carte de sensibilité
4. Carte de capacité d’adaptation

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Example 3: Pan-european Vulnerability Assessment

- ESPON Climate project
- basis for identifying regional typologies of climate change exposure, sensitivity, impact and vulnerability
- tailor-made adaptation options can be derived which are able to cope with regionally specific patterns of climate change
- seven case studies from the transnational to the very local level
- Weighting by Delphi-based approach (questionnaire survey)


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Potential economic impact of climate change

Aggregated potential impact of climate change
Change in regional exposure to coastal storm surge events

Inputs:
- Storm surge heights of a 100-year return event (no CC proj. Incl.)
- Ass.: due to Sea-level-rise storm surge heights increase 1m
- Based on global DEM Hydro1k (USGS 2010), 1km resolution, calculated which areas would be additionally inundated by coastal flooding

Potential physical impact of climate change

This pattern results from sea level rise and a projected increase in river floods. It fits well with the climate change types North-western and Northern Europe which came out of the cluster analysis.
Vulnerability studies with a sectoral focus:
- Vulnerability Assessment for climate change and the fisheries and the Aquaculture sector by the FAO

Vulnerability studies using PCA:

Thank you for your attention!