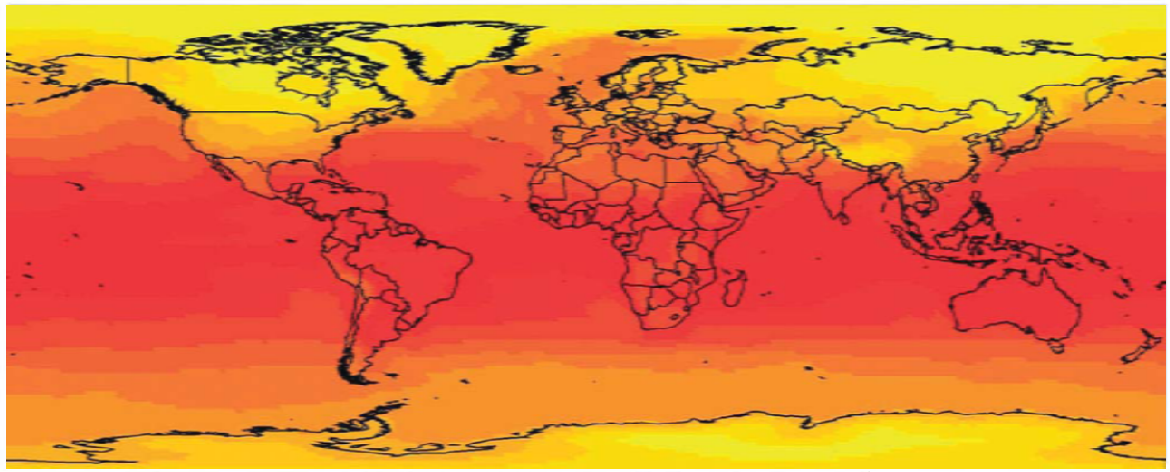
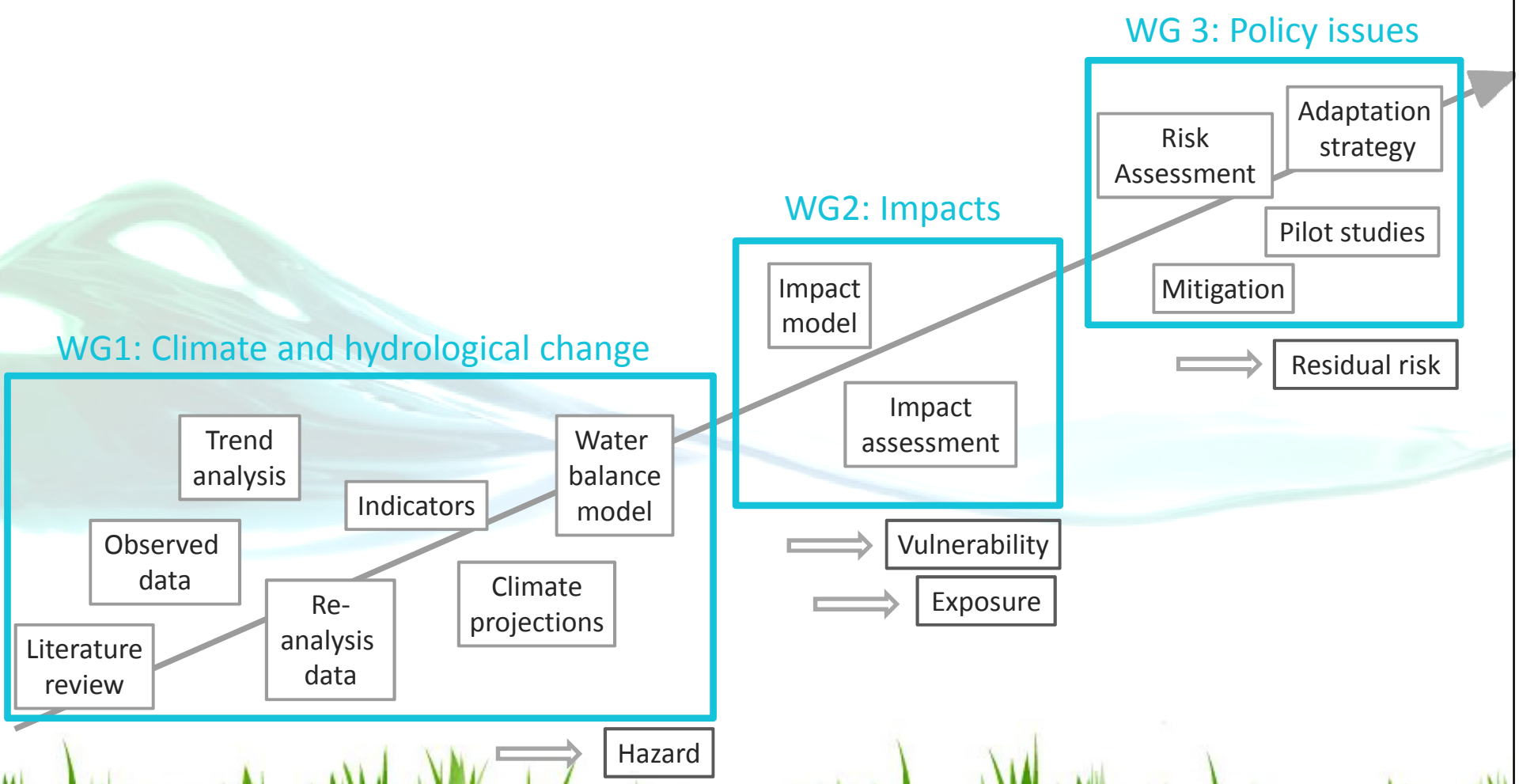


Introduction to group discussions

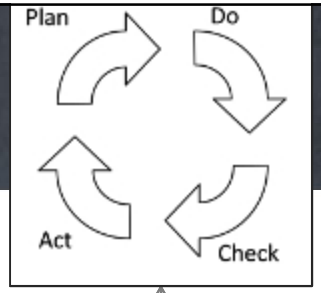
1st Rhine-Mekong Symposium
"Climate change and its influence on water and related sectors"
8-9 May 2014, Koblenz, Germany

Dr. Kai Gerlinger
HYDRON Consulting Engineers (Germany)

Working groups



Working groups



iterative process

WG1: Climate and hydrological change

- Trend analysis
- Indicators
- Water balance model
- Observed data
- Climate projections
- Re-analysis data
- Literature review

→ Hazard

WG2: Impacts

- Impact model
- Impact assessment

→ Vulnerability

→ Exposure

WG 3: Policy issues

- Risk Assessment
- Adaptation strategy
- Pilot studies
- Mitigation

→ Residual risk

Working groups

- WG1: Climate and hydrological changes and assessment including flood and drought
- WG2: Addressing climate change impacts and assessment in water related sectors
- WG3: Transboundary and policy issues in climate change adaptation

WG1: Climate and hydrological changes

Climate and hydrological changes and assessment including flood and drought

- What has been done so far?
- What is currently happening?
- Which starting points/ideas exist for cooperation?

WG1: Climate and hydrological changes

Climate and hydrological changes and assessment including flood and drought

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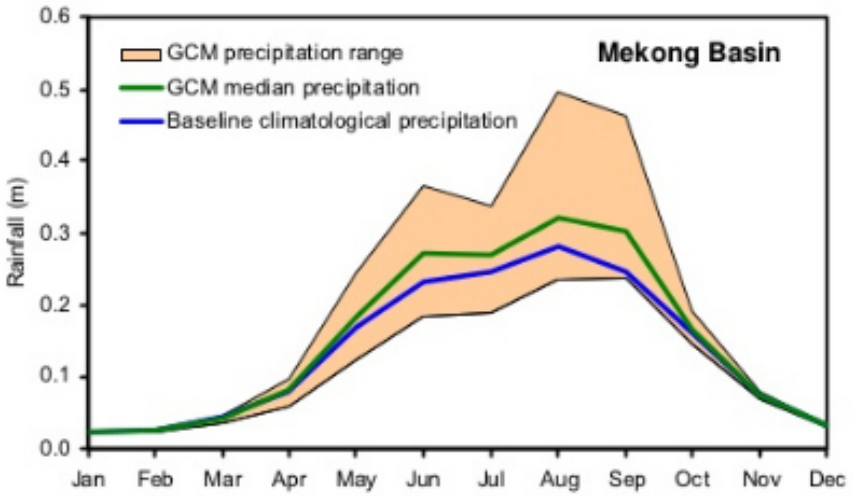
Purpose: *reduce the geographical scope so that resolution can be improved*

1. **Statistical**
   - Assumes local climate is conditioned by large-scale (global) climate but does not try to understand physical causality
   - GCM output is compared to observed information for a reference period to calculate period factors
   - Period factors are then used to adjust GCM time-series
2. **RCM (Regional Circulation Models)**
   - most sophisticated way to downscale GCM data
   - Physically based
   - 25-50km resolution
   - Computationally intensive
   - Requires detailed understanding of regional atmospheric and ocean processes
3. **Pattern-scaling**
   - Uses high resolution observation data to scale GCM data to small areas or monitoring points
   - Suitable when there is extensive observation data
   - Cannot correct for statistical bias so should only be used to assess relative changes



Baseline (1951-2000) versus future (2030) monthly mean precipitation.

Eastham et al. 2008

WG1: Climate and hydrological changes

Climate and hydrological changes and assessment including flood and drought

- What has been done so far?
- What is currently happening?
- Which starting points/ideas exist for cooperation?
  - How can SRES and RCP scenarios be jointly assessed?
  - How should challenges of climate projections be handled?
    - Downscaling? Bias-Correction? Reliable observed data?
    - Selection of suitable ensemble members? Usage of ensemble mean projection?
    - Consideration of outliers?
  - Which hydrological models are suitable? How can uncertainties of hydrological models/basin development be taken into account?
  - Which indicators are meaningful and basin-wide obtainable?

WG2: Climate change impacts

Addressing climate change impacts and assessment in water related sectors

- What has been done so far?
- What is currently happening?
- Which starting points/ideas exist for cooperation?

Navarro 2012

WG2: Climate change impacts

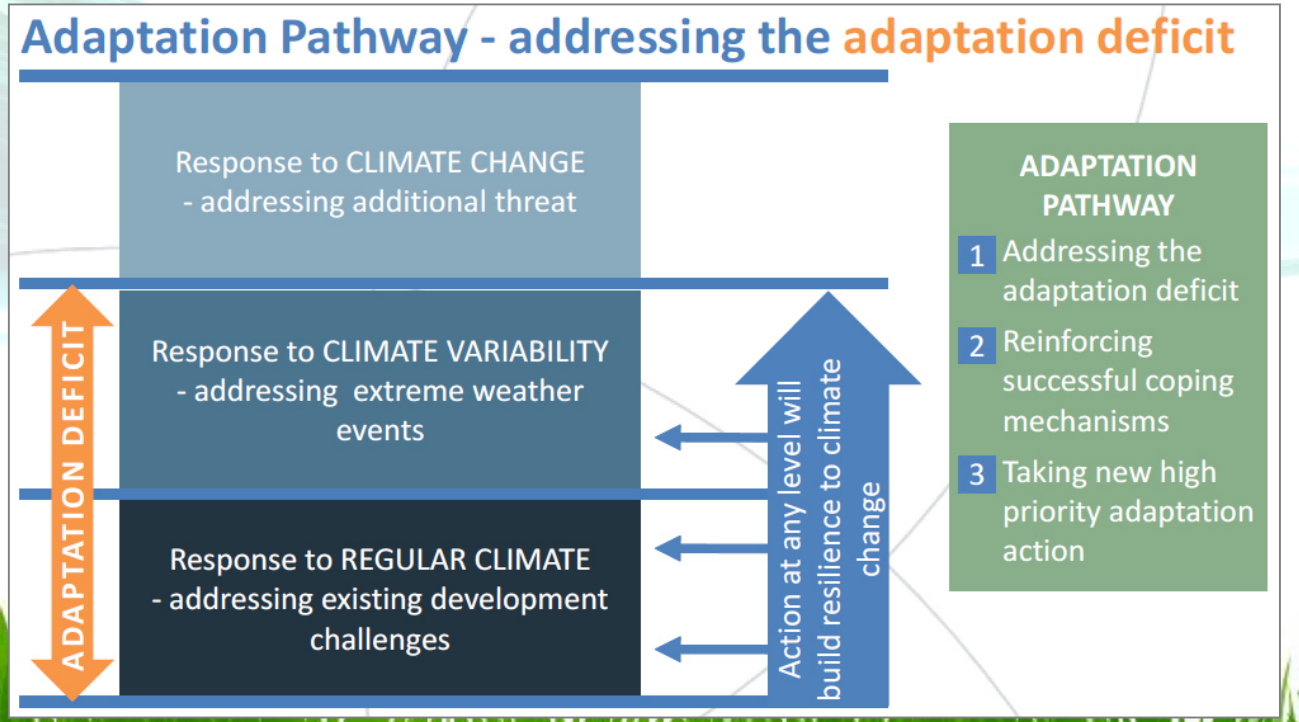
Addressing climate change impacts and assessment in water related sectors

- What has been done so far?
- What is currently happening?
- Which starting points/ideas exist for cooperation?
  - What kind of impact modelling is necessary? Do we have to wait until water balance models perform better?
  - How are most relevant impacts identified?
  - How are uncertainties considered?
  - How to integrate the water-food-energy nexus under climate change?
  - Does climate change also have positive impacts?

WG3: Climate change adaptation

Transboundary and policy issues in climate change adaptation

- What has been done so far?
- What is currently happening?
- Which starting points/ideas exist for cooperation?



WG3: Climate change adaptation

Transboundary and policy issues in climate change adaptation

- What has been done so far?
- What is currently happening?
- Which starting points/ideas exist for cooperation?

  - How is adaptive capacity assessed?
  - How can effective adaptation occur despite large uncertainties?
  - How are different assets “traded off” against each other?
  - What are examples of successful adaptation?
  - How to come to a flexible and no regret strategy?
  - How can the river commissions effectively communicate their adaptation strategies to the member countries? How to mainstream adaptation into basin development?

Bibliography

- Carew-Reid, J., Ketelsen, T., Kingsborough, A., and Porter, S. (2011): Climate Change Adaptation and Mitigation (CAM) Methodology Brief. ICEM – International Centre for Environmental Management. Hanoi, Vietnam.
- Eastham, J., F. Mpelasoka, M. Mainuddin, C.Ticehurst, P. Dyce, G. Hodgson, R. Ali and M. Kirby, (2008): Mekong River Basin Water Resources Assessment: Impacts of Climate Change. CSIRO: Water for a Healthy Country National Research Flagship
- ICEM (2013): USAID Mekong ARCC Climate Change Impact and Adaptation: Main Report. Prepared for the United States Agency for International Development by ICEM - International Centre for Environmental Management
- Navarro, C. (2012): Downscaling of GCM for it's use in Agriculture and NRM Research . - Presentation Transcript. Cali, Colombia CIAT 10/10/2012