Complementarity of Regional Climate Change Adaptation Strategy to National Strategies – the Danube Case

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Danube River Basin – the most international RB in the world
Danube River Protection Convention

29 June 1994, Sofia (Bulgaria)

ICPDR coordinates implementation of EU Water Framework Directive & EU Floods Directive on basin-wide level

ICPDR Contracting Parties

- Germany
- Austria
- Czech Republic
- Slovakia
- Hungary
- Slovenia
- Croatia
  - EU Member States (9)
  - Non-EU Member States (5)
- Bosnia & Herzegovina
- Serbia
- Montenegro
- Romania
- Bulgaria
- Rep. of Moldova
- Ukraine
- European Union
ICPDR Contracting Parties
GDP / Renewable WR

Levels of Management

Part A: ICPDR – coordination on Danube basin-wide level
Part B: Sub-basin and/or national level
Part C: RBM units within country
Significant Water Management Issues on Danube basin-wide level

- Organic Pollution
- Nutrient Pollution
- Hazardous Substances Pollution
- Hydromorphological Alterations
- Groundwater


Reflects
- Water status of the DRB waters
- Significant Water Management Issues

Includes
- Joint Programme of Measures
- Evaluation on measure implementation

Enables
- Conclusions on investment & funding
Water is in the focus of climate change adaptation

“Water and its availability and quality will be the main pressures on, and issues for, societies and the environment under climate change.”
(IPCC Technical paper “Climate Change and Water, 2007”)

Danube Ministerial Meeting 2010

ICPDR was asked to develop until 2012 a Climate Adaptation Strategy for the Danube River Basin
Climate Change Adaptation Strategy

Main steps

- **Step 1 (during 2011)**
  Danube Climate Adaptation Study
  - Knowledge base, summarising expected impacts and possible adaptation measures
  - Based on existing climate change studies and projects

- **Step 2 (March 2012)**
  Climate Adaptation Workshop
  - Presentation and broad discussion with countries and stakeholders
  - Acceptance of results on basin-wide level
  - Knowledge base, summarising expected impacts and possible adaptation measures
  - Based on existing climate change studies and projects

- **Step 3 (finalised in 2012)**
  Danube CC Adaptation Strategy
  - Joint elaboration of Strategy with input from different Expert Groups
  - Accepted in December 2012

Water-related impacts

Uncertainty

![Uncertainty Diagram](image-url)
Vulnerability

- **Vulnerability assessment** (VA) helps to design suitable adaptation measures.
- Currently **no consistent and homogenous VA in place** for the whole basin - complex, time and resource intense.
- VA for whole basin not seems to be feasible option on the short term.
- **First step** towards VA is **existing impact analysis** – well set to create common understanding and knowledge base.

Danube Climate Adaptation Strategy

**Approach for implementation of adaptation measures**

- Danube Climate Adaptation Strategy does **not** include a separate programme of measures!
- Making best use of **existing structures and water management planning instruments**:
  - EU **Water Framework Directive** and EU **Floods Directive** are main tools for adaptation
  - ICPDR Expert Groups and Task Groups mandated to **incorporate Climate Adaptation** in Danube River Basin and Danube Flood Risk Management Plan
  - **Cyclic and adaptive approach**
Cyclic and adaptive approach for adaptation

Based on 6-years planning cycle of WFD and Floods Directive

2015-2021, 2021-2027, ...

Implementation of Programmes of (Adaptation) Measures

ICPDR Climate Adaptation Strategy

2012, update 2018, ...
(+ 6 years)

6 years Management Cycle

WFD Analysis / Flood Hazard and Flood Risk Maps

2013, 2019, ...
(+ 6 years)

2015, 2021, ...
(+ 6 years)

River Basin / Flood Risk Management Plans

Adaptive approach for adaptation – time horizons

„Getting the flood turn into the right direction“

A2 scenario (2010 – 2029)

A2 scenario (2061 – 2080)

A1B scenario (2021 – 2050)

A1B scenario (2071 – 2100)

3rd WFD & 2nd FD planning cycle 2021-2027

2nd WFD & 1st FD planning cycle 2015-2021

Danube Climate Adaptation Strategy adopted (2012)
Mainstreaming adaptation

ICPDR Expert Groups were mandated to fully integrate adaptation in water management planning processes.

Inter-sectoral cooperation is key!

Guiding Principles Sustainable Hydropower (June 2013)

Joint Statement Inland Navigation and the Environment

Sustainable flood risk management
2018 update of Danube Climate Change Adaptation Strategy

- At the Danube Ministerial Meeting in February 2016 Ministers asked “the ICPDR to foresee an update of its strategy, in particular with regard to its knowledge base, in 2018 in order to prepare the updated strategy in time for the next planning cycle of the EU Water Framework Directive and EU Floods Directive”.

- The work on the update and revision of the study started in January 2017 (LMU Munich). It will integrate the new scientific results in climate change research (Paris agreement, etc) and the resulting impacts on water availability in the DRB.

- It will be investigated to which extent the new scientific findings and developments will influence existing adaption measures and to what extent these have to be adapted to the new research results.

- Findings of this study will be included in the revision of the ICPDR strategy on climate change.

- Germany, Austria and Serbia act as lead countries in the frame of the ICPDR for this activity.
2017 update of Danube Climate Change Adaptation Strategy

- In the first step the new IPCC (International Panel on Climate Change) climate change scenarios and model results from Assessment Report 5 (AR5) and their integration in research projects and national adaption strategies were investigated.
- The results within the DRB are compared and evaluated. In order to gain additional information from the national level on the implementation of the ICPDR Strategy on Adaptation to Climate Change a draft questionnaire has been developed. We expect first results in mid of July.

Adoption of National Adaption Strategies

2012

All Nations in the Danube catchment have adopted national strategies, except Croatia, and Serbia (in preparation) and Montenegro. In several other nations, the NAS has already been reviewed or is under review.

For all nations the 6th National Communications under the UNFCCC is adopted.

....and 2017
Almost all nations addressing impacts on water availability due to climate change in the 6th UNFCCC communications

But ... only some are suggesting adaption measures

There is a similar picture analysing the NAS:
NAS addressing impacts on water availability due to climate change

NAS suggesting adaption measures
Analysing UNFCCC communications and NAS: Both activities are analysed and combined. Measure were suggested either on one or in both strategies.

Priorization of impact fields due to suggested adaption measures by the analysed activities in the UNFCCC communications and NAS. The ranking of the impact fields were prioritized due to the number of the suggestions.

<table>
<thead>
<tr>
<th>Impact Field</th>
<th>%</th>
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<tbody>
<tr>
<td>General, water related adaptation measures</td>
<td>86</td>
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<td>Floods</td>
<td>71</td>
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<td>Agriculture</td>
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<td>Water quality / contamination</td>
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<td>Water supply / demand</td>
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<td>Water related energy production</td>
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<td>Droughts / low flow / water scarcity</td>
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<td>Water availability / runoff / groundwater</td>
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<td>Biodiversity / ecosystems</td>
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<td>Forestry</td>
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<td>Health</td>
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<td>Soils / erosion / sedimentation</td>
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<td>Coastal zones</td>
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<td>Water temperature</td>
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<td>Limnology</td>
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<td>Snow/ice/permafrost</td>
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Comparing NAS and UNFCCC communications shows large differences in the preception of climate change impacts on water availability. In the UNFCCC it is addressed by far more often than in the NAS, but less countries are suggesting adaption measures.

→ Contradictions and differences between NAS and UNFCCC communications
→ More contradictions concerning the knowledge base: Different climate scenarios (SRES and RCPs) and Global climate models (GCM) are used in neighboring countries and within one watershed
→ This leads to different climate change impacts concerning temperature and precipitation
→ Main reason for this is probably different dates for adoption of NAS and UNFCCC.
Applied emission scenarios in National and Regional Adaptation Strategies, climate studies and the 6th National Communication. In three countries no specifications about climate scenarios can be found in the reports.

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Analysing the used climate scenarios for the 1st strategy, A1B is by far the mostly used one. Meanwhile, the new RCPs and the former SRES are used. The makes the assessment climate change in case of temperature and precipitation difficult. Especially because also different modeling periods and global climate models are used. See next slides.
It is very obvious that for many countries the temperature is no longer quantified: number -999 means „not quantified“. It is only documented in terms like „significant increase in temperature…“, or just only „…expected increase in temperature…“.

On the other hand sometimes only summer or winter temperatures are given, but no annual mean. In Slovakia only for the area of Hurbanovo values are given(!?)

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**JRC Study “Modelling water demand and availability scenarios for current and future land use and climate in the Sava Basin” in comparison to NAS or 6th National Communication of the catchment countries**

<table>
<thead>
<tr>
<th>Study/NAS</th>
<th>JRC</th>
<th>Slovenia</th>
<th>Croatia</th>
<th>Bosnia and Herzegovina</th>
<th>Serbia</th>
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<tr>
<td>Projected Period</td>
<td></td>
<td>2071-2100</td>
<td>not available</td>
<td>2071-2099</td>
<td>2071-2100</td>
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Projected temperature change (mean annual,)

- Continental part, winter: + 3.5 - 4°C (A1B), continental part, summer: + 4 - 4.5°C (A1B)
- Mean seasonal change: + 1.8 - 3.6°C (A1B)  Mean annual change: +3.4 – 3.8 (A2)
Mekong Adaptation Strategy and Action Plan

- Process of preparation of MASAP is very similar to the process that we had on Danube scale, with more detailed analysis that we had.
- Less countries (4) makes process more difficult because of level of commitment. It is easier to reach consensus on Danube (14 countries) level than on Sava (4 countries) level! Importance of political commitment.
- Adaptive approach to water management, i.e. very detailed following of trends is highly important
- Development of national institutions and national capacities are crucial for success
- Regional strategies could give boost to funding opportunities.

Conclusions

- **Joint understanding** (i.e. on scenarios and related impacts) and **shared knowledge base** is essential for **joint decision making** in a trans-boundary basin – this is not an easy task!!!
- Building on what we have – making **best use of existing structures** and water management instruments and **mainstreaming of adaptation**
- Coordination requirements – climate change is cross-cutting issue, requiring **interdisciplinary approach**
- Dealing with **uncertainty** – not all problems can be solved immediately, suggesting **step-wise and adaptative approach**
- Time horizon – not forget to address other **socio-economic developments** which might have even bigger impact then climate change itself – water nexus approach!!!
- Clear **political committment is crucial**!
Thank you