Transboundary and cross-sector adaptation: experience from the Danube basin
Danube River Basin – the most international RB in the world
Danube River Protection Convention

29 June 1994, Sofia (Bulgaria)

Protection of water & ecological resources
Sustainable use of water
Reduce nutrients & hazardous substances
Manage floods & ice hazards

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 Delegations of Contracting Parties

- River Basin Management
- Flood Protection
- Public Participation
- Pressures and Measures
- Information Management and GIS
- Monitoring and Assessment
- Ad hoc Strategic
- Hydromorphology
- Accident Prevention and Control
- Nutrients
- Groundwater
- Navigation
- Hydropower
- Agriculture
- Climate Adaptation

Participation in international expert groups of country representatives and stakeholders
Stakeholder Involvement
22 Observer Organisations

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”, June 2008)
National Climate Adaptation Strategies - 2012

Overview of the current status of National Adaptation Strategies in the DRB (as of January 2012)

FIGURE 3
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

**Step 3** (finalised in 2012)  
Danube CC Adaptation Strategy

- Joint elaboration of Strategy with input from different Expert Groups
- Adopted in December 2012
Climate Change Adaptation Strategy
Main elements

Contents:
1. Introduction
2. Framework conditions
3. Climate change scenarios
4. Water-related impacts
5. Vulnerability
6. Overview of possible adaptation measures
7. Guiding principles on adaptation and integration into ICPDR activities
8. Next steps
Danube Climate Adapation Strategy

Climate change scenarios

**Annual mean temperature changes**

<table>
<thead>
<tr>
<th></th>
<th>2021 – 2050</th>
<th>2071 - 2100</th>
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<tbody>
<tr>
<td>Annual mean</td>
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<td>temperature</td>
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<td>changes</td>
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**Changes in mean annual precipitation**

- More precip
- Less precip
- Reversal of seasonal precipitation distribution
Water-related impacts

• **Changes** in seasonal *runoff patterns*

• **Droughts**, low flow situations and *water scarcity* likely to become *more intense*, longer and more frequent

• Local and regional *increased heavy rainfall*, however, *no clear picture for changes in flood* magnitude and frequency

• **Changes for ecosystems** and biodiversity predicted with shifts of aquatic and terrestrial flora and fauna

• **Sectors** as agriculture, forestry, navigation and water related energy production *likely to suffer*
Water-related impacts

Uncertainty
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.
## Adaptation measures “tool box”

**Example: Water scarcity and drought**

<table>
<thead>
<tr>
<th>Type</th>
<th>Possible adaptation measures</th>
<th>Time horizon</th>
<th>Options for cooperation</th>
<th>Challenges</th>
<th>Source (countries)</th>
</tr>
</thead>
</table>
| Preparation measures for adaptation | **Monitoring systems**
- Establishment of new and maintenance, optimization and extension of existing monitoring systems
- Measures are required to improve the quality, spatial coverage and accessibility of meteorological, hydrological, water use, water quality, social and economic data, including the use of remote sensing methods (e.g. improvement of the drought forecasting capacity of the National Weather Forecast Services by providing access to European forecasts and EUMetsat satellite data)
- Adaptation of the hydrometric networks to track the impact of climate change on water resources, providing enough redundancy to obtain accurate estimations of naturalised stream flow series from observation, closing the water balance in each sub-basin
- **Development of early warning systems** on droughts and low flows
  - Consideration of European and national levels
  - Provision of information on spatial extent, duration, time of occurrence in relation to the crop calendar, and severity
  - Development of prototypes and set up implementing procedures for an operational European Drought Observatory and early warning system | m            | x                        |            | NAS (AT, CZ, MD), WFD 24, EU COM, BAYKLAS, JRC 2005, UNFCCC (BA), UNECE 2010, UNECE 2009, ADAM |
|                               | **Carrying out drought risk mapping** and development of drought risk vulnerability profiles
- Identification of methodologies for drought thresholds and drought mapping
- Development of drought status indicators based on indicators for meteorological, agricultural and hydrological droughts and guidelines for indicator thresholds setting for different drought status in specific water distribution systems
- Identification of the most drought-prone zones at a micro-level in order to develop more specific adaptation measures | m            | x                        |            | NAS (CZ), WFD 24, UNECE 2009, EU COM, UNFCCC (BA), NAS (MD), ADAM, ST_BLOESCHL_AT |
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
- Strategy includes Guiding Principles (from CIS Guidance Document No. 24), supporting ICPDR Expert Groups and Task Groups in adaptation
Cyclic and adaptive approach for adaptation

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

ICPDR Climate Adaptation Strategy

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

Implementation of Programmes of (Adaptation) Measures

2015-2021, 2021-2027, ...

WFD Analysis / Flood Hazard and Flood Risk Maps

River Basin / Flood Risk Management Plans

6 years Management Cycle

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

2015, 2021, ...
(+ 6 years)
Adaptive approach for adaptation – time horizons

„Getting the fleed turn into the right direction“

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.
Integration between different levels of management and inter-sectoral cooperation – IWRM approach

Integration between different levels

- WFD and Floods Directive approach – Level A-B-C
- Focus on key issues and coordination on basin-wide level; more detailed planning on national level

Integration between different sectors

- Strong involvement of different sectors and interest groups (i.e. observers, public participation)
- Synergies but also potential conflicts need to be addressed at an early stage in the planning process
Climate change and environmental policies
Examples for potential synergies but also conflicts

- Flood risk management
- Natural water retention measures
- Increase of renewable energy
- Biodiversity

Potential synergies
Potential conflicts
Inter-sectoral cooperation is key!

Guiding Principles Sustainable Hydropower (June 2013)

Joint Statement Inland Navigation and the Environment

Sustainable flood risk management
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.

- 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.

- It`s about **getting on the right track** – „don`t let the perfect be the enemy of the good“.

- Clear **political committment is crucial!**
Thank you