Management of Sediment Quality and Quantity in the Danube River Basin

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CONTENT

- ICPDR & EU WFD implementation
- Sediment quantity & quality
ICPDR & EU WFD
Implementation
Sediment quality and quantity in DRB

• 10% of Europe
• 83 mil inhabitants
• 19 countries

Most international river basin in the world

Source: European Commission, adjusted for ICPDR, 2004

Sediment quality and quantity in DRB
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Economic Factors

GDP per capita (PPP) in $, 2006

Bar chart showing GDP per capita (PPP) for various countries in 2006.
The Danube River Protection Convention

Signed 29. June 1994
Entry into force 22. October 1998
Permanent Secretariat since 1 October 1999

A legal frame for co-operation to assure the protection of water and ecological resources and their sustainable use in the Danube River Basin

Sediment quality and quantity in DRB

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The International Commission for the Protection of the Danube River (ICPDR) has been established to implement the objectives and provisions and to achieve the goals of the Danube River Protection Convention.

Sediment quality and quantity in DRB
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<tr>
<th>Contracting Parties</th>
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<td>Austria</td>
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<td>Bosnia &amp; Herzegovina</td>
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<td>Rep. of Serbia</td>
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<td>Romania</td>
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<td>Rep. of Moldova</td>
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<td>Ukraine</td>
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<td>European Union</td>
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<th>Montenegro</th>
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<td>(ratification process under way)</td>
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EU Water Framework Directive

ICPDR – common platform for the implementation of EU WFD in the Danube River Basin

Sediment quality and quantity in DRB

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Danube Basin Analysis
2004

First comprehensive analysis of the entire Danube River Basin
Basis for any future river basin management planning
Identification of significant water management issues

Sediment quality and quantity in DRB
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Significant Water Management Issues

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

Agenda Item: 3.1

Sediment quality and quantity in DRB
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Identification Significant Water Management Issues

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Danube River Basin Management Plan

......has to be compiled by 2009/10

good coordination mechanisms and a clear strategy including timelines are needed

Part A
Roof Level

Part B
Sub-Basin/ national Level

Part C
Sub-Unit Level

Common structure in all parts of the RBM Plan.

• Competent authorities jointly coordinate Part A. Part C is coordinated on the national level

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Outline DRBM Plan 2009

1. Introduction
2. Setting the Scene
   - Development DRBM Plan, Basin wide scale, Danube Basin Analysis
3. Identified Significant Pressures in the DRBD
   - Rivers, transitional & coastal waters, Groundwater
   - addressing each SWMI
4. Monitoring networks and ecological/chemical status
   - Rivers, transitional & coastal waters, Groundwater
   - addressing each SWMI as well as other significant issues (sediments)
5. Environmental objectives and exemptions
6. Economic analysis of water uses
7. Joint Programme of Measures based on national PoMs
   - Rivers, transitional & coastal waters, Groundwater
   - addressing each SWMI
8. Water Quantity issues and Climate Change
9. Annexes
Sediment quantity & quality
Damming and sediment transport

• Sediment accumulation in dams - extraction needed
  ➡ Gravel extraction 15 000 m³/a in Abwinden–Asten dam
  ➡ In the Iron Gate, 325 million tons of sediment accumulated between 1972 and 1994, and filled 10 % of the entire reservoir capacity

• Reduced sediment discharge leads to riverbed erosion – artificial material donation necessary to stabilize riverbed
  ➡ Austrian Danube downstream Vienna - the riverbed is eroding at a rate of 2.0 – 3.5 cm/year
  ➡ downstream the Freudenau dam addition of 160 000 m³ bed load per year is required
  ➡ Significant erosion downstream the Iron Gate
Sediment balance

Sediment deficit in the Danube due to damming and regulation works reported in the Roof Report 2004

No deficit of suspended solids reported in the upper Danube
Sediment balance

- Accuracy of sediment transport assessment is essential:
  - extreme flood event in August 2005 on the Inn at Innsbruck - 1.74 mil. tons transported
  - annual sediment load in 2004 - 0.82 mil. tons

- Cooperation with IHP/UNESCO - project on assessment of the sediment balance in the Danube River
Dredging

- Securing waterway transport
- Danube Delta: in 1960 – 1990 canals dredged to optimize water circulation needed for fish farming
- Dredging for construction purposes (HU/SK)
- Cooperation with CEDA on formulation of environmental aspects of dredging in the Danube River
Joint Danube Survey

Mercury in Sediments

- Danube
- Tributaries

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comparison NP in spm: JDS 1 - JDS 2

mg/kg dry matter

selected JDS sampling sites from JDS5 to JDS94
Sediments are ecosystems *per se*

Toxicity of contaminants in sediments depends on various factors:

- **Physical factors:**
  - grain size, pore water, gas content, temperature

- **Chemical factors:**
  - organic matter, redox conditions, pH, ammonia, sulfides

- **Biological factors:**
  - macrobenthos density and bioturbation, microbial activity

- **Anthropogenic activities:**
  - dredging, fluvial transport, etc.

- Meteorological and hydrological conditions

⇒ Harmonisation needed for toxicity testing and monitoring
Thank you for your attention

For more information, please visit

www.icpdr.org