Morava River Basin - Slovakia

Pavel Hucko
General description of the basin – Slovak territory

Morava river basin is bounded by the White Carpathians and the Small Carpathians.

River basin districts of the Slovak Republic and their sub-basins:

- Morava
- Váh
- Hron
- Slaná
- Dunajec and Poprad
- Bodrog including Tisa
- Danube
- Amulik
- Dunaj
- Východná

Legend:
- Danube River Basin District
- Vistula River Basin District
- Borders of sub-basins
- Main courses
- State border
General description of the basin – Slovak territory

### General

<table>
<thead>
<tr>
<th>River Basin - SK</th>
<th>Area in the country in km²</th>
<th>Area in the country in %</th>
<th>Inhabitants in the basin mil.</th>
<th>Population density inh/km²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morava, 127.5 km</td>
<td>2 282</td>
<td>8</td>
<td>0.2</td>
<td>94</td>
</tr>
</tbody>
</table>

### Land use (%)

<table>
<thead>
<tr>
<th>River Basin - SK</th>
<th>Waterbodies</th>
<th>Forests</th>
<th>Cropland</th>
<th>Grassland</th>
<th>Urban/industrial areas</th>
<th>Wetlands/peatlands</th>
<th>Other forms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morava</td>
<td>0.27</td>
<td>36.26</td>
<td>45.17</td>
<td>2.01</td>
<td>5.60</td>
<td>0.14</td>
<td>10.55</td>
</tr>
</tbody>
</table>

**Protected areas**

In Slovakia there are 3 large protected areas – Zahorie covers valuable natural ecosystems along the lower part of the Morava River. There are two Ramsar localities – alluvium of the Rudava river and the lower part of the Morava river.
### Water resources

<table>
<thead>
<tr>
<th>River Basin - SK</th>
<th>Surface water resources mil. m³/year</th>
<th>Groundwater resources mil. m³/year</th>
<th>Total water resources mil. m³/year</th>
<th>Total water resources per capita m³/year/capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morava</td>
<td>350</td>
<td>92.18</td>
<td>442.18</td>
<td>2 211</td>
</tr>
</tbody>
</table>

**Average for the years 1961 to 2000**

### Discharge characteristics

<table>
<thead>
<tr>
<th>Discharge characteristics</th>
<th>Discharge</th>
<th>Period of time</th>
</tr>
</thead>
<tbody>
<tr>
<td>( Q_{av} )</td>
<td>106.37 m³/s</td>
<td>1961-2000</td>
</tr>
<tr>
<td>( Q_{max} )</td>
<td>1 500 m³/s</td>
<td>1922-2010</td>
</tr>
<tr>
<td>( Q_{min} )</td>
<td>7.7 m³/s</td>
<td>1922-2010</td>
</tr>
</tbody>
</table>

**Long-term average flow at the mouth of the Morava in the Danube: 118.7 m³/s**
Main problems in the basin and their relative importance

- Hydromorphological changes on rivers interrupted natural river and habitat connectivity and hydrological regime.
- Food processing industry, machine industry - automobile manufacturing are situated in lower part of river basin.
- Insufficient sewerage systems, source of nutrient pollution, organic pollution and chemical pollution; agglomerations without collecting system and treatment.
- Insufficient system for evidence and control of waste deposits (point source of pollution) – it has to be improved.
- Potential risk is presented by old landfills, especially during flood.
Distortion of the longitudinal connection of rivers and habitats

2009 year
Weirs, slides, dikes

2015 year
Weirs, slides, dikes

- Interconnecting barrier for fish
- Impassable barrier for fish

On the River Morava measures are the responsibility of the neighboring country – The Czech Republic.
Main problems in the basin and their relative importance

✓ Intensive abstraction of groundwater in the alluvial aquifers of Morava river for drinking water purposes.

✓ The use of fertilizers, manure, pesticides was high in last 4 years, in last decade the consumption of agricultural substances rapidly decreased. The future can expect a slight decrease in their content in groundwater.

✓ Perspective - it is assumed that the extent of entry of nitrogen into groundwater in the coming years will not radically increase.
Status and transboundary impacts related to water quality and water quantity

The most serious water quality problems are eutrophication, organic pollution, bacterial pollution, and pollution by hazardous substances.

Legal and policy framework at the national and transboundary level

Bi- and multilateral transboundary agreements

- Bi-lateral - Cooperation in international Morava river basin is realized by Ministry of Environment of Slovakia through Agreement among Slovak government and government of Czech Republic on water management on transboundary waters.

- Multilateral cooperation - both countries signed Danube River Protection Convention – ICPDR serves as a platform for cooperation.
Legal and policy framework at the national and transboundary level

**National laws/regulations**

**National strategies**
- Conception of water management policy in Slovakia up to 2015.

**Institutional framework**
“Agreement among Slovak government and government of Czech Republic on water management on transboundary waters” is realized through Slovak – Czech Commission. In the frame of Commission three common (Slovak-Czech) working groups were established:
1. For WFD issues
2. Water quality issues
3. Water quantity issues
Legal and policy framework at the national and transboundary level

Non structural management instruments

- Plan according WFD requirements for national part of Danube River is available (Water Plan).
- Common measurements, data harmonisation, data exchange and experience exchange, common projects.
- Three codexes of good agricultural practice were elaborated in Slovakia. They are voluntary and valid for all territory of Slovakia.

Structural/technological measures

- Construction of WWTPs is realized on national territory – reflecting transitional periods Slovakia obtained for implementing UWWTD.
- Waste water reuse or artificial recharge is not realized.
- Irrigation in the Slovak part of Morava river do not belongs to the significant way of water using at present.
Legal and policy framework at the national and transboundary level

Monitoring of transboundary waters

**Implemented measures:**

- Monitoring of surface water – monthly for general physical-chemical parameters, biological parameters frequency according to WFD requirements.
- Joint monitoring programmes for water quantity and quality is executed several times per year according to agreed time.

**Funding:**

Monitoring – state budget or EU Operational program for Environment, Assessment – state budget.
Status of surface waters

Chemical status WB SW

Ecological status/potential WB SW

WORKSHOP ON TRANSBOUNDARY WATER RESOURCES MANAGEMENT IN WESTERN AND CENTRAL EUROPE
BUDAPEST, HUNGARY, 8-10 FEBRUARY 2011
Financing and investment

➢ Economic instruments are in place in Slovakia. If present instruments are adequate (to comply with article 9 WFD) will show more detailed study realized in close future.

➢ Financing and investments related to the IWRM Both – national and EU funds.

Involvement of stakeholders

Public participation

➢ Main communication tool – Internet, professional magazines and writing comments. Active involvement during seminars organized for WFD issues.
Involvement of stakeholders

Private sector involvement

- Main communication tool – Internet, professional magazines and writing comments. Active involvement during seminars organized for WFD issues, conferences for individual target groups (e.g. yearly conference for water managers of industrial companies,...).

Gaps in the involvement of stakeholders:

- Intensity of public involvement and communication tools are not fully sufficient.
- Foreseen measures to address these gaps: Developing of new strategy for public involvement for second WFD planning cycle.
Climate change adaptation measures

**Implemented measures:**

Slovak national climatic program is carried out since 1993. Their main tasks are:

a) Design of monitoring stations.

b) Analyses of changes and variability’s of hydrological parameters in monitoring stations.

c) Possible impacts climate change on agricultural production.

d) Possible impacts of climate change on forest ecosystems.

e) Proposal of adaptation measures for elimination of negative impacts of climate change on water management.
Thank you for your attention!