FLOOD protection in Slovakia
&
The Slovak Water Management Enterprise, s.e.

The INBO 7th World General Assembly
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Debrecen, Hungary

Ing. Branislav Lipták
The Slovak Water Management Enterprise, s.e. Banská Štiavnica, Slovakia
Location of Banská Štiavnica in the heart of Europe
The headquarters of SWE, s. e. in Banská Štiavnica
Historical water reservoirs in the surrounding of Banská Štiavnica
Danube River (basin):

Length (km): 2,960
Drainage Area (km²): 817,000
Discharge (m³/s): 6,500
Countries: 17
Population: 80,000,000
Sea at Mouth: Black

- Danube River basin: 96% of Slovakia
- Wistula River basin: 4% of Slovakia
The Rivers in Administration of SWE, s.e.

Surface of basins  cca 49 015 km²
The Organizational Structure of the SWE, s.e.
Subject of activities

The main subjects of activities of the enterprise are administration and protection of surface and ground waters, complex hydrological activity within the river basin and to ensure other activities, especially:

• catering for public utilities

• administration of the concerned water courses and to ensure all their functions, implementation of the right to manage the water courses and water works built on them

• to ensure effective protection of waters, water courses and water works

• implementation of specific activities related to administration of border water courses and the following activities resulting from specific agreements related to border water courses

• to ensure surface water supply from water courses and reservoirs including its use for generating electric energy in the range determined by state water administration bodies

• to ensure development, operation and maintenance of waterways, to form conditions for utilization of water courses and reservoirs for navigation and other national economic use

• implementation of safeguarding works to prevent unfavourable affects of waters on water courses and water works, implementation of tasks resulting from flood plans and decisions of flood commissions during flood activities

• implementation of building, assembling and maintenance works, extraction of river materials, extraction and production of aggregate and cutting trees off forests

• monitoring and evaluation of water quality in water courses, taking of water and other handling with waters, collection of money according specific provisions

• operation of fish farming of the enterprise

• Implementation of other tasks resulting for the state enterprise from the act on waters and related legal rules including supervision activities in protected water management areas
### State property administered by SWE, s. e.

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total basin area</td>
<td>km²</td>
<td>49 015</td>
</tr>
<tr>
<td>Water courses</td>
<td>km</td>
<td>29 917</td>
</tr>
<tr>
<td>... from that - trained water courses</td>
<td>km</td>
<td>8 189</td>
</tr>
<tr>
<td>Flood protection dikes</td>
<td>km</td>
<td>3 074</td>
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<tr>
<td>Drainage channels</td>
<td>km</td>
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<tr>
<td>Water reservoirs</td>
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<tr>
<td>Water reservoirs for drinking water</td>
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<tr>
<td>Volume of water reservoirs</td>
<td>mil.m³</td>
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<tr>
<td>Retention Volume of water reservoirs</td>
<td>mil.m³</td>
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<tr>
<td>Surface of water reservoirs</td>
<td>km²</td>
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<tr>
<td>Weirs</td>
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<tr>
<td>Ship locks</td>
<td>number</td>
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</tr>
<tr>
<td>Pumping stations for internal waters (flood protection)</td>
<td>number</td>
<td>70</td>
</tr>
<tr>
<td>Historical water management structures (water reservoirs)</td>
<td>number</td>
<td>23</td>
</tr>
</tbody>
</table>
... our dreams ..... 
... beautiful morning...
... holiday ....
Floods!

Natural phenomenon, climate changes...
Districts in the Slovak Republic, where states of Emergency were raised in the period I. - VIII. 2006.

Flood activity degrees

- 2nd - state of Danger
- 3rd - state of Emergency
Flooding

BEFORE
- IWRM, ... „INBO“
- River and basin cond.
- Rainfall - runoff models
- Flood risk maps
- Land-use planning
- Forecasting and Warning
- Flood protection inspections
- River trainings, construction reservoirs...

DURING
- Flood plans
- Security (safeguarding) activities (by water management sector)
- Emergency (rescue) activities (by interior sector)
- Fraction and evacuation of the population on the threatened territories
- Data processing

AFTER
- Flood protection
- Data processing
- to know river basin models calibration
- Protection of dikes from surge, leakages, impact of erosion, seepage and protection from overflow the top of the dike
- Protection and evacuation of the inhabitants on the threatened territories
- Protection and rescuing the property

What we can do ???

????
Floods

We need to be prepared

We need to do our best „BEFORE“ ...

- Prevention flood protection measures:
  - Data, models, systems, IWRM management
  - Awareness, preparedness .... PEOPLE ...
  - Dikes, retention in country, ... sand bags
Legal basis:

3. Bilateral agreements

1. The Constitution of the Slovak Republic
3. The Slovak Flood Protection Act (Nr. 666/2004)

I. Preliminary flood risk assessment by December 22, 2011

II. Flood hazard maps and flood risk maps by December 22, 2013

III. Flood risk management plans by December 22, 2015
   - prevention
   - protection
   - preparedness

... repeated in a six-year cycle.
Organization of Flood Protection on the Territory of the SR

- Government of the SR
  - Central flood protection commission
    - Technical staff CFPC
      - CFPC Secretary
      - Operating team – MoE SR
        - SWE
        - Branch office of riverbasin
        - Territorial office of riverbasin
      - Operating team – Dept. of protection HS-PO, MoI SR
        - Flood protection commission RO
        - Flood protection Commission DO
        - Rescue team
      - Operating teams of other sectors
        - Subordinated enterprises and organisations, army ...
        - Forests of SR
        - Hydromeliorations s.e Bratislava
Information flow
data collection

**SHMU**
Slovak hydrometeorological institute

**Municipalities**

**Citizens**

**Media**
TV, broadcast, newspapers

**Flood Protection Commission**
- Central Flood Protection Commission
- Flood Protection Commission BR
- Flood Protection Commission RO
- Flood Protection Commission DO

**Decisions**
- Security (safeguarding) activities (by water management sector)
- Emergency (rescue) activities (by interior sector)
FLOOD PLANS

• Fixed phasing related to **flood activity degrees** (water levels, threat of exceptional snow melting, ice events)
  1\(^{\text{st}}\) degree (state of Alert)
  2\(^{\text{nd}}\) degree (state of Danger)
  3\(^{\text{rd}}\) degree (state of Emergency)

• The plans are specific for different river basins
• They contain concrete actions with specific personnel attached
• There is specified the structure of flood authorities and flood protection system
• Format for situation reports is clearly specified
• Procedure for post-event evaluation
Security (safeguarding) activities

- Protection of dikes from surge, leakages, impact of erosion, seepage and protection from overflow the top of the dike
- Protection of water course channel and banks from violating and damaging
- Elimination of barriers disabling smooth water flow
- Striking ice blocks and obstructions
- Special operations on the water management systems
- Closing breaches on dikes
- Draining water from flooded territory
- Draining and pumping inner waters
- Building secondary flood protection lines
- Etc.
Security (safeguarding) activities

Protection of dikes from surge, leakages, impact of erosion, seepage and protection from overflow the top of the dike
Security (safeguarding) activities

Draining and pumping inner waters
Financial support of EU  2004 - 2006
- Preventive flood protection measures

Structural funds
(1 050,3 mil. EUR for SR)

Cohesion Fund
(509,7 mil. EUR for SR)

Community Initiatives
(56,5 mil. EUR for SR)

Community Action Programs
Flood protection measures 2004 - 2006

**Structural Funds**

Approved 21 projects ... 6,681 mil. EUR

... projects of - river trainings,
   - dikes reconstructions,
   - flood damages elimination,
   - ...

**Cohesion Fund**

Bratislava (The Capital of SR) – Flood protection:
...... under construction .....  
31,239 mil. EUR (eligible costs)

CF: 26,553 mil. EUR

State budget: 3,124 mil. EUR

Own resources: 1,562 mil. EUR

Structure of financing:
- ERDF 80 %
- State budget 15 %
- Own resources 5 %

Structure of financing:
- CF 85 %
- State budget 10 %
- Own money 5 %
Community Initiatives

**INTERREG III B**: GIS FORUM– PROJECT D4D, DANewBE Data, MOSES …

Community Action Programs

Socrates, **Leonardo da Vinci**, Life, Youth, Daphne, …
Teaching and Learning in Virtual Learning Environments for Water Management
"Teaching and Learning in Virtual Learning Environments for Water Management"

**Main goal**

Online education system

- in the area of flood protection and renewal of a country's retention ability.
"Teaching and Learning in Virtual Learning Environments for Water Management"

Project partners

The Slovak Republic:
The Slovak Agricultural University Nitra,
The Slovak University of Technology Bratislava,
The Slovak Water Management Enterprise Banská Štiavnica

The Czech Republic:
Mendel Agricultural and Forestry University Brno,
Labe River Basin Management Enterprise, Hradec Králové,

Germany:
Osteuropazentrum Universität Hohenheim Stuttgart,
Ingenieurbüro Winkler und Partner GmbH Stuttgart,

Poland:
Szkola Glowna Gospodarstwa Wiejskiego w Warszawie,
Instytut Badawczy lesnictwa w Warszawie,

Hungary:
University of Debrecén,
Vituki Consult Rt Budapest.
"Teaching and Learning in Virtual Learning Environments for Water Management"

The expected specific results:
- Rework of the **LMS** (Learning Management System)
- Creation of **6 modules** system for training of the target group
  - **Module 1** Hydrology and applied hydrology of water resources
  - **Module 2** Water resources use and protection
  - **Module 3** Integrated Water Resources Management
  - **Module 4** Habitats of water courses and their dynamics, revitalization of water courses
  - **Module 5** Flood prevention measures in the country and settlements, reduction of disasters
  - **Module 6** Natural and human-made wetland ecosystems and their sustainable use
- Combined models of education (eLearning, establishment of transnational virtual study groups... )
- The development of a pilot course for the target group,
- Etc.
"Teaching and Learning in Virtual Learning Environments for Water Management"

**Products:**
- self-contained online education system
- CD ROM,
- Online course (The Internet),
- Text materials
- Internet portal (web page)
- www.fem.uniag.sk/water_management/
- Leaflets, posters …
- Publication in press and specialized magazines
- Participation in conferences …
Thank you for your attention!

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Bratislava – flood situation on the Danube river quay in summer 2002
Floods in Slovakia

The Ondava River - flood protection dike failure in 2004
Floods in Slovakia

The Danube river in 1965
Floods in Slovakia

The Hron river in 1974
Floods in Slovakia

Šahy in 1999
Flood prevention

The Beša polder in 1999
Floods in Slovakia

Tichý potok (Silent Creek) in 1997
Flood prevention

The Morava river in 1997
Floods in Slovakia

Devínska Nová Ves in summer 2002