Water threats at river basin scale

Igor Liska

Perception of water threats

- Waters in the Community are under increasing pressure from the continuous growth in demand for sufficient quantities of good quality water for all purposes (WFD I(4));
- Between 1998 and 2004, Europe suffered over 100 major damaging floods, including the catastrophic floods along the Danube and Elbe rivers in summer 2002 (EFD website);
- Water resources are vulnerable and can be strongly affected by climate change (UN/ECE Guide, 2009).

Water quantity:
- Floods
- Droughts

Water quality:
- Organic pollution
- Nutrient pollution
- Pollution by hazardous substances
- Accident pollution
- Hydromorphological alterations

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;
- ICPDR has been established to implement the objectives and provisions and to achieve the goals of the Danube River Protection Convention.
ICPDR Contracting Parties

- Germany
- Austria
- Czech Republic
- Slovakia
- Hungary
- Slovenia
- Croatia
- European Union
- Bosnia & Herzegovina
- Serbia
- Montenegro
- Romania
- Bulgaria
- Rep. of Moldova
- Ukraine

Organisational structure under DRPC

- ICPDR
- StWG
- Monitoring
- Assessment
- Pressures
- Measures
- Flood
- RBM
- RBMP Coordination
- and Guidance
- Service support
- Info exchange
- Mandate & Report

LEGEND
- Hydro-morphology
- Ground-water
- Tisza
- AEWS
- AP
- Flood risk

NOTE
Further Task Groups may be created according to the needs

Floods

- Danube River Basin suffered from massive floods in 2002, 2005 and 2006;
- Each year devastating regional floods occur in Danube countries endangering lives and causing human tragedy as well as heavy economic losses.

ICPDR response to floods

- Action Programme on Sustainable Flood Protection in the Danube River Basin adopted in 2004:
  - Improvement of flood forecasting and early flood warning systems;
  - Preparation and coordination of flood action plans in sub-basins;
  - Common approach in flood risk mapping;
  - Exchange of expert knowledge.

- 17 flood action plans for the sub-basins in the Danube catchment area prepared in 2009 based on 45 national plans;
- Sub-basin plans contain hundreds of measures the Danube countries are going to take to keep their citizens safe against the flood danger;
- Preparation process strengthened international cooperation.
Flood protection under ICPDR – future plans
- Joint implementation of the EU Floods Directive in the Danube River Basin;
- EU project Floodrisk (€ 6.5 mil) developing joint flood risk maps for the Danube and defining a common methodology;
- Cooperation with EC JRC on Improving Danube Flood Alert System.

Floods – impact of climate change
Relative change in 100-year return level of river discharge between scenario (2071-2100) and control period (1961-1990) for the 3.9ºC (left) and 2.5ºC (right) scenarios (PESETA project)

Droughts
- Europe is considered as having adequate water resources, but water scarcity is an increasingly frequent phenomenon;
- EU report on Drought Management Plans (2007);
- DMPs:
  - drought early warning system based on hydrological indicators;
  - drought stages scale;
  - program of mitigation measures to be applied under drought conditions;
  - should include cross-border coordination in transboundary basins;

Droughts
- Droughts are not the SWMI in 1st DRBMP, will be investigated in next cycles (also in connection to climate changes);
- Drought management is part of the WFD Art. 5 Analysis of the Tisza River Basin (2007) and will be part of RBMP therein.
- The Tisza Analysis:
  - Lists the most commonly used indicators;
  - Provides overview of droughts in the riparian countries;
  - Reviews groundwater depletion;

Organic pollution
Reference Situation:
- 6,224 agglomerations > 2,000 PE in the DRB:
- 2,000 – 10,000 PE: 4,969 agglomerations
- > 10,000 PE: 1,255 agglomerations
- Many agglomerations without wastewater treatment or sewerage connection;
- No wastewater collection: more than 2,900 aggl. = 12.6% of the generated load.

Organic pollution - scenarios
BOD5 and COD emissions – different scenarios:
- Reference situation
- Baseline Scenario-UWWT 2015
- Midterm Scenario-UWWT (beyond 2015)
- Vision Scenario-UWWT (beyond 2015)
Achievement of WFD environmental objectives on the basin-wide scale by 2015 not ensured.

Nutrient pollution
Overall Baseline Scenario – Nutrients 2015 considers most likely developments in different sectors (urban wastewater, agriculture, atmospheric deposition) by 2015.

Pollution by hazardous substances
- Emission data based on EPER (EU MS) and ICPDR Emission Inventory data;
- Lack of knowledge on sources, pathways and losses of hazardous substances on the basin-wide scale;
- More detailed monitoring data on hazardous substances are needed;
- EU IPPC and other EU Directives are key instruments for reduction of emissions of hazardous substances;
- Further measures are needed.

Accident pollution
Hydromorphological alterations

- HYMO components in DRBMP
  - River and habitat continuity interruption
  - Disconnection of adjacent wetlands/floodplains
  - Hydrological alterations
  - Future infrastructure projects

- Key drivers
  - Hydropower generation
  - Navigation
  - Flood protection
  - Water supply

Future infrastructure projects

- Future Infrastructure Projects can impact and deteriorate the water status;
- 112 Future Infrastructure Projects reported;
- 70 of them in Danube River;
- 57% dedicated to navigation; 28% to flood protection;
- Rest: hydropower generation, water supply and other purposes;
- 25 projects are subject to WFD Article 4(7) in EU MS.

Conclusions

- Integrated RBM requires to consider all relevant threats to water and their interrelation;
- EU legislation provides a good basis for managing water threats;
- Implementation of water protection policies requires cooperation with all stakeholders;
- Public participation is an important prerequisite for a successful implementation;
- Impacts of climate change to be taken into account.

WHAT?

- Integration of flood risk management and river basin management;
- Priority & emerging substances – monitoring, impacts, distribution pathways, reduction policies;
- Quality & quantity of sediments;
- Invasive species & ecological status assessment;
- Etc………
WHAT?

- Integration of flood risk management and river basin management;
- Priority & emerging substances – monitoring, impacts, distribution pathways, reduction policies;
- Quality & quantity of sediments;
- Invasive species & ecological status assessment;
- Etc.........