

Title:

Lessons from River Basin Management in the World's Most International River -The Danube

This paper has extensively used information and built upon text from the following documents: Dr Ursula Schmedtje and Philip Weller, Development of a Danube River Basin Management Plan in line with the requirements of the EU Water Framework Directive, Paper to be presented at IWA World Water Congress, Marrakech, September 2004, and Strategic Paper for Development of a Danube River Basin Management Plan, ICPDR. May 2002.

Introduction

The Danube is the most international river in the world. Thirteen countries together comprise 99% of the territory of the basin and a further five countries have small amounts of land area in the basin. These thirteen major countries and the European Union signed the Danube River Protection Convention in 1994, that committed them to coordinated management of water resources. To coordinate the work under the Convention the International Commission for the Protection of the Danube River (ICPDR) was founded. The ICPDR has established a secretariat based in Vienna and developed a work group structure involving the input of experts from each of the countries.

The commitment to work together under the Convention obliges the countries to undertake specific actions in support of coordinated management of water resources. First and foremost, the countries have obliged themselves to exchange information about water quality. As a result, the Trans-National Monitoring

Network(TNMN) has been created. They have also established an Accident Early Warning System that provides warning of accidental pollution. In addition they have committed themselves to measures aimed at reducing the pollution inputs to the Danube and its tributaries. A five-year Joint Action Programme, adopted in the year 2000, outlined the specific commitments. Further, they have committed themselves to coordinated actions to minimise and respond to floods.

In recent years the work undertaken under the Convention, and in the structures established, has been reinforced by the adoption of a commitment to utilise the EU Water Framework Directive as a basis for organising water management efforts. All the Contracting Parties of the Convention have committed themselves to implement the EU Water Framework Directive although less than half the parties are currently EU member states. This commitment has been made with a political objective of legally harmonising the countries of the Danube more closely with the European Union, and in recognition of the value of this comprehensive legislation in providing a framework for further assessment and identification of measures needed by Danube countries to ensure the basis for sustainable water management.

The maturing institutional arrangements under the Convention and the legal and methodological advancement provided by the EU Water Framework Directive have been further strengthened by the financial support provided to Danube countries by the United Nations Development Programme /Global Environment Facility

(UNDP/GEF) Danube Regional Project. This 17 million USD project, which began in November 2001, supports transboundary cooperation in reducing nutrient pollution and in strengthening water resources management. This project has provided important financial and intellectual resources that have reinforced the work of the ICPDR and helped facilitate the implementation of the EU Water Framework Directive, particularly in those countries outside the EU Accession process.

These elements combined, a strong institutional commitment, the legal and methodological framework of the EU WFD, and the financial support of the UNDP GEF have provided a solid basis for achieving integrated river basin management in the most international river basin in the world. To date, considerable progress has been made, but much remains to be done.

The Danube River Basin

The Danube River Basin is the second largest river basin of Europe, covering 801 463 km².

The population residing within the Danube basin is 81 million. Table 1 provides a listing of the countries that have territory in the basin and their population as well as the percentage of the population living within the basin.

Table 1 - Coverage of the states in the Danube River Basin (DRB) and estimated population (data source: Competent authorities in the DRB unless marked otherwise; MS = EU Member State, CC = Candidate Country)

State	Code	Status in European Union	Coverage in DRB [km ²] ¹	Percentage of DRB [%]	Percentage of DRB in state [%]	Population in DRB [Mio.]	Percent of population in DRB [%]
Albania	AL	-	126	< 0.1	0.01	< 0.01	< 0.01
Austria	AT	MS	80 423	10.0	96.1	7.7	9.51
Bosnia i Herzegovina	BA	-	36 636	4.6	74.9	2.9	3.58
Bulgaria	BG	CC	47 413	5.9	43.0	3.5	4.32
Croatia	HR	CC	34 965	4.4	62.5	3.0	3.71
Czech Rep.	CZ	MS	22 870	2.9	31.1	2.8	3.46
Germany	DE	MS	56 184	7.0	16.8	9.3	11.49
Hungary	HU	MS	92 778	11.6	100.0	10.2	12.60
Italy ²	IT	MS	560	< 0.1	0.2	0.02	0.02
Macedonia	MK	-	109	< 0.1	0.2	< 0.01	< 0.01
Moldova	MD	-	12 834	1.6	35.6	1.1	1.36
Poland	PL	MS	430	< 0.1	0.1	0.04	0.05
Romania	RO	CC	231 511	29.0	97.4	21.0	25.94
Serbia and Montenegro	CS	-	88 635	11.1	90.0	9.8	12.11
Slovakia	SK	MS	47 271	5.9	96.0	5.2	6.42
Slovenia	SI	MS	16 389	2.0	81.0	1.7	2.10
Switzerland	CH	-	1 809	0.2	4.3	0.02	0.02
Ukraine	UA	-	30 520	3.8	5.4	2.65	3.27
Total			801 463	100		80.95	100

¹ For the purpose of comparison the coverage of the states was calculated using GIS based on the DRBD overview map. These values differ slightly from the official data of some countries, since other methods of calculation have been used.

² Data source: Autonomous Province of Bozen – South Tyrol.

Besides being a major river basin itself, the Danube also has a number of sub-basins that are the size of other important international river basins in Europe. The Tisza River Basin, for example, is the largest sub-basin in the Danube River Basin (157 186 km²) and is a slightly larger than the Elbe River Basin (148,268 km²). Five countries (Ukraine, Romania, Hungary, Slovakia and Serbia and Montenegro) have territory within the Tisza River Basin. In addition, the Sava River is the largest Danube tributary by discharge (average 1564 m³/sec) and the second largest by

catchment area (95,419 km²). The Sava River Basin includes territories of Slovenia, Croatia, Bosnia I Herzegovina and Serbia and Montenegro.

The Danube River, however, is not only impressive because of its size. It contains highly diverse geographic regions, and has a rich human history. It is also characterised by major socio-economic differences among the countries. There is a strong gradient from the upper to the lower Danube for indicators of economic strength. Germany and Austria have economies among the strongest of Europe, while downstream in Moldova and Ukraine the per capita income is less than 1,000 Euro per annum. This fact greatly influences the basin wide management of water resources and restoration and pollution reduction efforts. For example, the percentage of population connected to public water supply as well as to sewage disposal shows great differences and standards from West to East.

A unique feature of the Danube is the remarkable Danube Delta, the world's largest reed bed complex. It is largely situated in Romania and partly in Ukraine where the Danube enters the Black Sea, and is a bi-national biosphere reserve. The entire protected area covers 679 000 ha including floodplains and marine areas. The core of the reserve (312 400 ha) has been established as a "World Nature Heritage" in 1991. There are 668 natural lakes larger than one hectare covering 9.28 % of the Delta's surface.

The Danube is a river that binds and connects people. It is also a river that connects and binds important parts of Europe. The Danube begins in the EU Europe and travels through ten countries on its remarkable journey to the Danube Delta and Black Sea.

The Problems of the Danube

Like all major rivers of Europe, the Danube has historically been significantly altered and affected by human activities. Channelling and straightening of the river for transport and flood protection purposes have constricted and shortened the river. Dams for energy have blocked its flow. Land use alterations, such as the draining of wetlands and forest clearing, have reduced its naturalness, and pollution by both nutrients and toxic contaminants have all combined to impair the quality of the river.

The problems of the Danube developed slowly over time and are the cumulative impact of a number of actions. A UNDP/GEF supported programme for analysing the problems of the Danube in the mid nineties noted, "All countries within the Danube River Basin (including Germany and Austria) have to note that the water quality in many of the surface and groundwater bodies is not satisfactory." The report concluded, "As a rule, the insufficient water quality is directly related to anthropogenic activities and pollution sources." The Transboundary analysis identified 513 hot spots of pollution where action was needed to reduce pollution. An analysis of floodplains done in the frame of the project also found that about 80 % of the historical floodplain habitat had been lost in the Danube region.

Progressively during the past three decades the countries of the region began cooperating in response to the reduction of the quality of Danube waters. Even before the collapse of the Iron Curtain attempts were made to jointly exchange data on water quality. The political changes that altered the region at the end of the 1980s and early 1990s, however, provided both an impetus and incentive to strengthen the cooperation. Efforts began to formalise the cooperation through the development of a convention that was eventually signed in Sofia, Bulgaria on June 29, 1994.

The Management Arrangements

The "Convention on Cooperation for the Protection and Sustainable Use of the Danube River" (Danube River Protection Convention, DRPC) forms the overall legal instrument for cooperation and transboundary water management in the Danube River Basin. The main objective of the Convention is the sustainable and equitable use of surface waters and groundwater and includes the conservation and restoration of ecosystems. The Contracting Parties cooperate on fundamental water management issues and take all appropriate legal, administrative and technical measures, to maintain and improve the quality of the Danube River and its environment. Austria, Bulgaria, Croatia, the Czech Republic, Germany, Hungary, Moldova, Romania, Slovakia, Slovenia, Serbia and Montenegro, Ukraine and the European Union are presently Contracting Parties to the DRPC. Bosnia i Herzegovina has observer status but it is hoped will ratify the Convention this year. To facilitate

the implementation of the DRPC, the Danube countries agreed that with its entry into force the International Commission for the Protection of the Danube River (ICPDR) would be established.

The ICPDR set up a Secretariat based in Vienna, which coordinates the work of the countries under the Convention and the work of the Expert Groups in particular. Expert Groups for Monitoring, Laboratory and Information Management Systems (MLIM), Emissions (EMIS), Accident Prevention and Control (APC), Ecology (ECO), Flood Protection (FP), and River Basin Management (RBM) have been created. The organisation chart of the ICPDR can be seen in Figure 1. Each work group is composed of at least one expert from each country and meets twice or perhaps three times a year to undertake the work needed. Of importance, it is the experts from the countries who do most of the work needed in each of the work groups. The groups report regularly to the ICPDR on their work progress and/or seek guidance from the ICPDR on issues of policy.

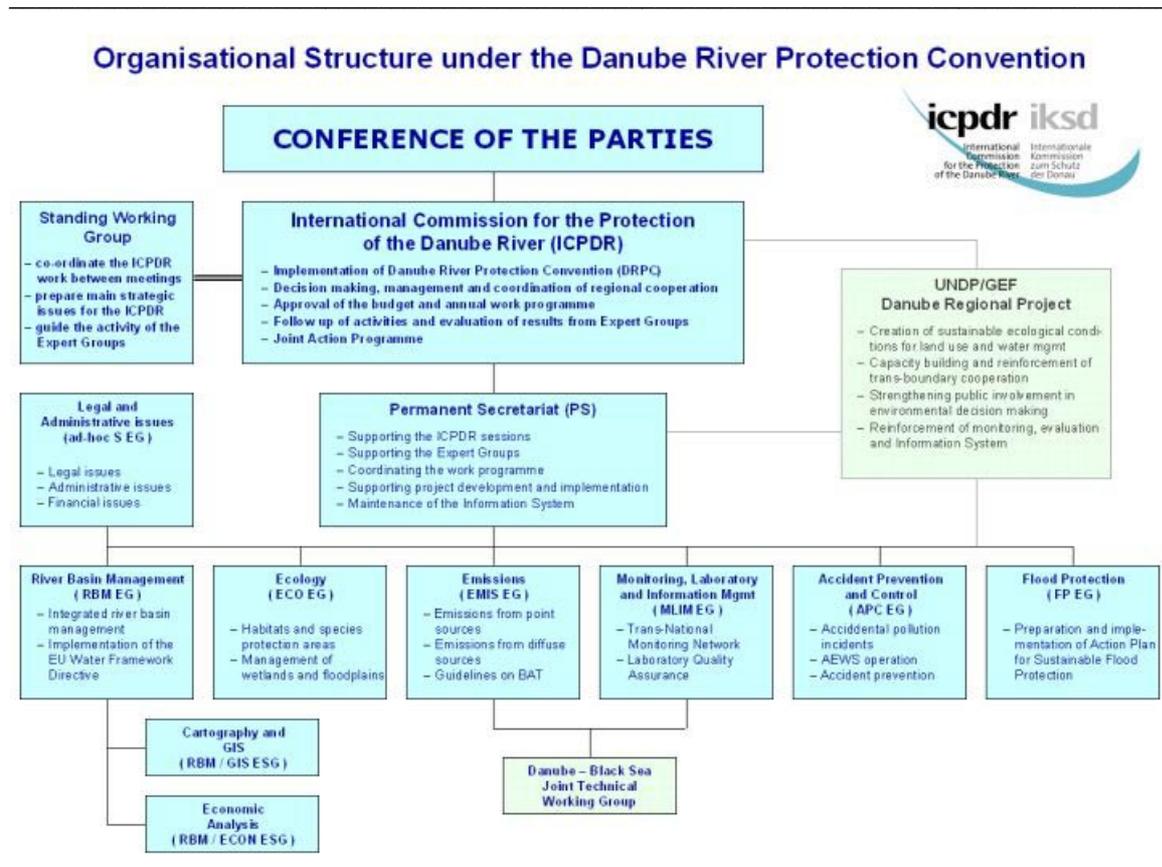


Figure 1 - ICPDR Organisation chart

From the early 1990s the European Commission (PHARE and TACIS Programme) and the United Nations Development Programme/Global Environment Facility (UNDP/GEF) have supported the building of capacity at the regional and national levels to develop mechanisms for cooperation under the DRPC. Currently UNDP/GEF is providing 17 million USD financing under the Danube Regional Project to support the countries of the region and the ICPDR in adopting new policies and measures for nutrient reduction and for sustainable river basin management. Specific projects have been targeted at industrial pollution, agriculture and supporting river basin management planning. A strong emphasis of the project is on communication and public participation activities. Although the project is independently managed by

UNDP, a steering committee composed of ICPDR Heads of Delegation from the Contracting Parties oversees the project and provides guidance to ensure the activities are compatible and supportive of the efforts and institutions managing water resources under the umbrella of the ICPDR.

In the ten years since the signing of the Convention, the International Commission for the Protection of the Danube River (ICPDR) has been established and matured as the forum for cooperation among the Danube countries. All the countries of the Danube have been actively participating in the work groups of the Commission and achieved important progress in their joint efforts to manage this shared river system. As ICPDR President Catherine Day stated during the celebration of the ten year anniversary of the signing of the Convention, "We have a number of successes to celebrate". She went on to note, however, that we have a "number of challenges still ahead of us."

One of those challenges is the effort to utilise the EU Water Framework Directive as a tool to achieve strengthened cooperation in water resources management.

The EU Water Framework Directive: An Essential Factor for Success

On December 22, 2000 the Water Framework Directive 2000/60/EC (EU WFD) came into force. The EU Member States (at the time this was Germany and Austria in the

Danube basin) are obliged to fulfill this Directive. The EU WFD brings major changes in water management practices. Most importantly, it:

- sets uniform standards in water policy throughout the European Union and integrates different policy areas involving water issues,
- introduces the river basin approach for the development of integrated and coordinated river basin management for all European river systems,
- stipulates a defined time-frame for the achievement of the good status of surface water and groundwater,
- introduces the economic analysis of water use in order to estimate the most cost-effective combination of measures in respect to water uses,
- includes public participation in the development of river basin management plans encouraging active involvement of interested parties including stakeholders, non-governmental organisations and citizens.

What makes the implementation process in the Danube River Basin a particular challenge is the fact that only some countries are EU Members and therefore obliged to fulfill the EU WFD. Besides Austria and Germany, four additional Danube countries have become EU Members States on May 1, 2004. Three other Danube countries are in the process of accession and are preparing to conform with the complete body of EU legislation in order to become EU Members. Others have not initiated a formal process to join the EU.

The Danube River Basin falls into the third category of rivers addressed in Art. 13.3 of the EU WFD – an international river basin extending beyond the boundaries of the European Community. The EU WFD requests the Member State or Member States concerned to *"endeavour to establish appropriate coordination with the relevant non-Member States, with the aim of achieving the objectives of this Directive throughout the river basin district"*. (Art. 3.5 EU WFD). Therefore, appropriate coordination mechanisms need to be introduced. The International Commission for the Protection of the Danube River (ICPDR) has been utilised to secure this coordination.

As the EU WFD has specified,

"In the case of an international river basin district extending beyond the boundaries of the Community, Member States shall endeavour to produce a single river basin management plan, and, where this is not possible, the plan shall at least cover the portion of the international river basin district lying within the territory of the Member State concerned." (Art. 13.3 EU WFD).

In November 2000 all Contracting Parties of the Danube River Protection Convention stated their commitment to implement the EU WFD within their jurisdiction and to cooperate in the framework of the ICPDR to achieve a single, basin wide coordinated Danube River Basin Management Plan. For the states with territories of less than 2 000 km² in the Danube River Basin (DRB) (Albania, Serbia and Montenegro (former FYR), Macedonia, Italy, Poland, Switzerland) the ICPDR has attempted to establish appropriate bilateral coordination.

In view of the size and number of states that have territories in the Danube basin, coordination is required on different levels in order to fulfill *"the environmental objectives established under Article 4, and in particular all programmes of measures"* (Art. 3.4 EU WFD). For issues of basin wide importance the ICPDR serves as the platform for coordination in the implementation of the EU WFD in the Danube River Basin District. Transboundary issues not covered by the ICPDR are solved at the appropriate level of cooperation, e.g. in the frame of bilateral/multilateral river commissions. Local issues remain a national task. Generally, coordination will take place at the lowest level possible so that the coordination via the ICPDR can be limited to those issues necessary on the basin wide level.

At its 3rd Ordinary Meeting on November 27-28, 2000 in Sofia, Bulgaria the ICPDR adopted the following resolutions:

- The ICPDR will provide the platform for the coordination necessary to develop and establish the River Basin Management Plan for the Danube River Basin.
- The Contracting Parties ensure to make all efforts to arrive at a coordinated international River Basin Management Plan for the Danube River Basin.

In the ICPDR all Contracting Parties, and Bosnia i Herzegovina as an observer, support the implementation of the EU WFD in their territories and cooperate in the framework of the ICPDR aiming in achieving a single, basin wide coordinated Danube River Basin Management Plan. The ICPDR President has addressed the other DRB countries not cooperating under the DRPC to commit themselves to

cooperate with the ICPDR to achieve a basin wide coordinated DRBMP. Poland, Switzerland, Macedonia and Albania have offered their support. From Italy no response was received. On the operational level, it is the obligation of the Contracting Parties to ensure the necessary coordination with their DRB neighbours not cooperating under the DRPC.

The River Basin Management Expert Group was created to prepare and coordinate the necessary activities for the implementation of the EU WFD. All countries cooperating under the DRPC are represented in the River Basin Management Expert Group. The group jointly agrees on the necessary actions for the development of the Danube River Basin Management Plan, e.g. the development of a strategy for establishing the RBM Plan, development of the roof report to the European Commission or identifying needs for harmonisation of methods and mechanisms.

The Danube countries cooperating under the DRPC report regularly to the ICPDR on the progress of EU WFD implementation in their own states. These national reports serve as a means for exchanging information between the states and for streamlining the implementation activities on the national level. At each of its Ordinary Meetings and Standing Working Group Meetings the ICPDR deals with the gradual implementation of the EU WFD in the Danube River Basin and takes the necessary decisions.

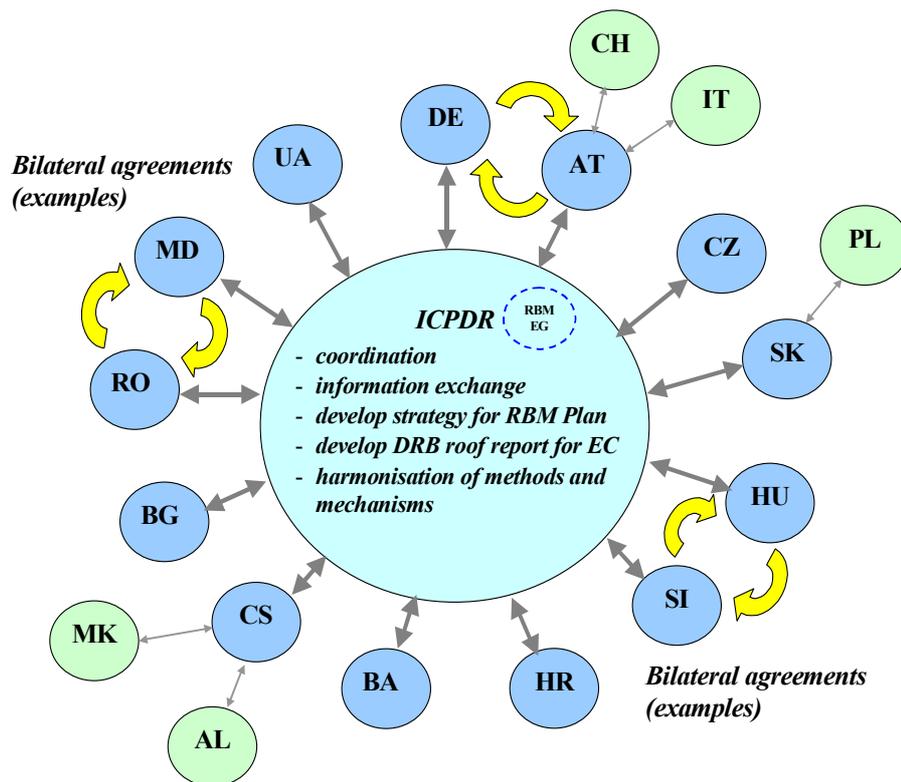


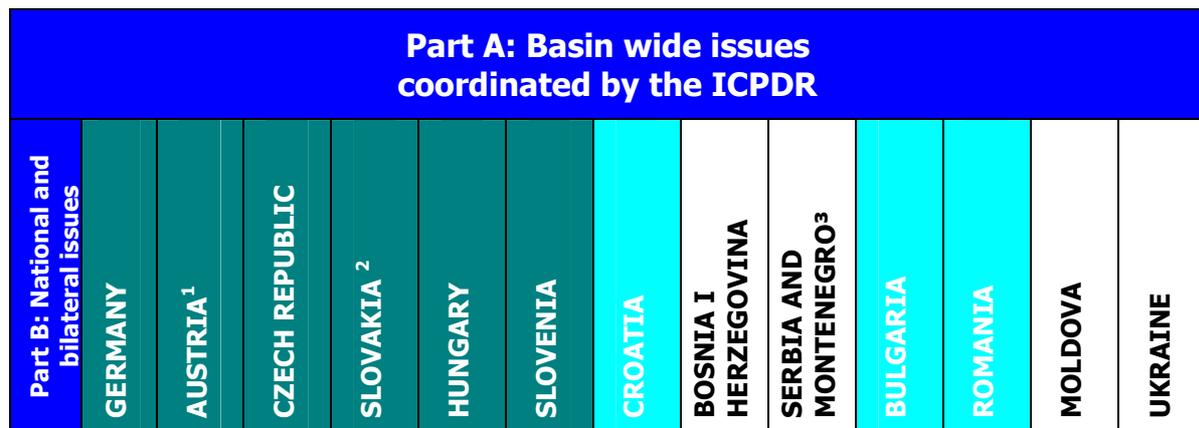
Figure 2 - Coordination mechanisms for EU WFD implementation in the Danube River Basin

Required under the Water Framework Directive are a series of reports which document the responsible authorities for water management in each country, analyse and determine baseline and reference information to achieve a characterisation of the waters, a pressure and impact analysis, and a programme of measures which will eliminate or reduce those pressures and impacts. The final product is the Basin Management Plan.

Development of The Danube River Basin Management Plan

Due to the large number of states and the coordination requirements in the Danube River Basin District (DRBD) it is necessary to divide the Danube River Basin Management Plan into two parts. Part A (roof of the DRBMP) gives relevant

information of multilateral or basin wide importance, whereas Part B (national input to DRBMP) gives all relevant further information on the national level as well as information coordinated on the bilateral level. The ICPDR has a coordinating and supporting function, but does not report on its own. Each state will deliver the roof report (Part A) and its own national report (Part B).



including bilateral coordination: ¹ with Switzerland and Italy, ² with Poland, ³ with Albania and Macedonia



Figure 3 - Structure of the Danube River Basin Management Plan¹

Part A – Roof report

The Roof report contains information on issues of multilateral or basin wide importance and demonstrates the basin wide coordination arrangements. This includes, in particular, an overview of the main driving forces of multilateral or basin wide importance and the related pressures exerted on the environment. The analysis

¹ This figure reflects the situation at the time of reporting (June 2004).

is based on data delivered by the competent authorities in the Danube River Basin.

Only where data is not available other data sources are used. The overview includes effects on coastal waters of the Black Sea as far as they are part of the Danube River Basin District. The Roof report intends to give an overview of the situation in the Danube River Basin district as a whole and to set the frame for the understanding of the national reports.

A summary of the relevant information on surface waters and groundwater will be given in Part A. Detailed information will be in Parts B. The Roof report deals with the following surface waters:

- all rivers with a catchment size of $> 4\,000\text{ km}^2$,
- all lakes, reservoirs and lagoons with an area of at least 100 km^2 , and
- the main canals.

Groundwaters are generally of local or regional importance and will be dealt with in the national reports. The Roof report deals only with the important transboundary groundwater bodies, in particular:

- all transboundary groundwater bodies $> 4000\text{ km}^2$, and
- transboundary groundwater bodies $< 4000\text{ km}^2$, if they are very important; the importance has to be based on certain bilaterally agreed criteria e.g. socio-economic importance, groundwater use, impacts, pressures, interaction with aquatic eco-systems.

The Roof report will be sent by the states to the European Commission with the National reports. The Roof report is identical for all states. The content of the management plan results from the work of the ICPDR Expert Groups and is approved by the ICPDR Ordinary Meetings. The ICPDR serves as the platform for coordination.

Part B – National reports

The national reports give all relevant further information on the national level as well as information coordinated on the bilateral level. Transboundary issues not covered by the ICPDR are solved at the appropriate level of cooperation, e.g. in the frame of bilateral/multilateral river commissions. Issues with local effects remain a national task. Generally, coordination will take place at the lowest level possible so that the coordination by the ICPDR can be limited to the basin wide issues.

For the report on the characterisation and analysis of the Danube River Basin in line with Art. 5 and Annex II and III EU WFD (Reporting deadline: 22 March, 2004) the 2-level outline will also be applied. The Danube River Basin Management Plan, which is due by the end of 2009, will most probably follow a 3-level approach, since it will be necessary to develop separate plans for the sub-basins in the Danube River Basin. A RBM Plan is currently under preparation for the Sava River Basin (shared by Slovenia, Croatia, Bosnia i Herzegovina and Serbia and Montenegro) as well as likely the Tisza and/or several sub-basins, namely the Somes/Szamos River Basin and the

Crisul/Körös River Basin (both shared by Hungary and Romania) as well as for the Hornád/Hernád River Basin (shared by Hungary and Slovakia).

The work of the International Commission for the Protection of the Danube River is concentrated on the development of a joint basin management plan and a harmonisation of methodologies and approaches for conducting the analysis needed. The first major step in that work – the characterisation of the basin – has been almost completed and forms the basis for identifying the problems and additional efforts and actions needed to reduce pollution, and minimize other pressures negatively influencing the quality of water in the basin.

The preliminary results of this work have shown that in recent decades, considerable improvements in environmental conditions in the Danube basin have been achieved. Where investments, e.g. in wastewater treatment, have been made, the water quality is visibly better. However, a major part of pollution reduction can be attributed to the decline of industries and agricultural activities in the middle and lower part of the basin. The main pressures are due to organic pollution, hazardous substances and nutrients. In addition, hydromorphological alterations are the cause of degradation throughout the basin. In these areas, investments for a sustainable reduction of pollution levels as well as from other pressures has just started and will have to continue for another 10 to 20 years.

This first characterisation of the Danube will soon be completed and will be presented at a Ministerial meeting to be held in December this year. Essential is, that this report should increase the clarity about the actions needed in the Danube River Basin and provide a basis for strengthening the political commitment in addressing them. It is needed to ensure prioritisation and transparency of actions needed to achieve good water quality across the entire basin.

Of importance, however, is to remember that the actions of governments alone will not bring improved water quality and environmental conditions to the Danube. Finding solutions will involve all sectors and groupings of people. Water managers alone can't solve the problems of the river and ensure that there is sustainable development. Everyone has a role to play.

For this reason the EU WFD calls for a Public Participation. Under the guidance of the ICPDR a methodology for Public Participation has been developed. Among the elements identified are local, regional and basin wide initiatives. One of the elements suggested was the convening of Danube Day on June 29 to celebrate among all peoples of the Danube the solidarity of all peoples in the Danube Basin. The first ever Danube Day in June 2004 was an overwhelming success with over 100 major events in all countries of the Danube basin. A Danube Art Master competition was held in connection with Danube Day and involved thousands of children collecting stones, driftwood and other objects from the Danube for use in art. The winners of this competition will be presented at the Ministerial meeting in December 2004.

Danube Day will be continued in subsequent years, was intended and appeared to

be successful in helping people understand their connection and the relation of their actions to the river and its well being.

Conclusion

Despite the difficulties of cooperation among the large number of states within the Danube region there has been important progress in establishing the necessary mechanisms for coordination and cooperation under the framework of the Danube River Protection Convention. The EU Water Framework Directive has added strength to the efforts to coordinate actions in support of integrated river basin management. Added to these elements has been the financial support provided by the UNDP /GEF Danube Regional Project.

The mechanisms for cooperation exist and agreement on the nature of the problems has been reached. It will nonetheless be important that many individual actions are taken that in total will add up to a cleaner and healthier Danube.

The future of the Danube Region will be dependent upon the solutions to the challenges that exist. Those challenges are many and varied:

- Achieving agricultural development that protects the waters.
- Adopting industrial strategies that prevent pollutant releases.
- Ensuring a transportation policy that is fitted to the river and not requiring the river to be fitted to the policy.

We have had significant success in efforts to achieve cooperative management, but these efforts will be tested in future by the challenges above. It is the responsibility of each and every one of us to ensure our actions and activities benefit the maintenance and sustainability of the ecosystem that supports us. The International Commission for the Protection for the Danube River is assisting in providing a forum for the necessary dialogue, understanding and action needed to meet these challenges.

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