TECHNICAL FOCUS PAPER

# Integrated water resources management in Central and Eastern Europe:

## IWRM vs EU Water Framework Directive

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Global Water Partnership

The **Global Water Partnership's** vision is for a water secure world.

Our mission is to advance governance and management of water resources for sustainable and equitable development.

Global Water Partnership (GWP) is an international network, created in 1996 to foster an integrated approach to water resources management (IWRM). IWRM is a process which promotes the coordinated development and management of water, land, and related resources in order to maximise economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.

The Network is open to all organisations that recognise the principles of an integrated approach to water resources management endorsed by the Network. It includes states, government institutions (national, regional, and local), intergovernmental organisations, international and national non-governmental organisations, academic and research institutions, private sector companies, and service providers in the public sector.

GWP's Technical Committee is a group of internationally recognised professionals and scientists skilled in the different aspects of water management. This committee provides technical support and advice to the Partnership as a whole. The Technical Committee has been charged with developing an analytical framework of the water sector and proposing actions that will promote sustainable water resources management.

A **Technical Focus Paper** is a publication of the GWP Technical Committee aimed at harnessing and sharing knowledge and experiences generated by knowledge partners and Regional and Country Water Partnerships.



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# Contents

# Acronyms

| | |
|---|---|
| CAP | Common Agricultural Policy |
| CEE | Central and Eastern Europe |
| CIRCABC | Communication and Information Resource Centre for Administrations, Businesses and Citizens |
| CIS | Common Implementation Strategy (of EU) |
| CWP | Country Water Partnership |
| DRB | Danube River Basin |
| DRBM | Danube River Basin Management (plan) |
| DRBD | Danube River Basin District |
| DRBMP | Danube River Basin Management Plan |
| DRPC | Danube River Protection Convention |
| EU | European Union |
| EU WFD | European Union's Water Framework Directive |
| EAFRD | European Agricultural Fund for Rural Development |
| ERWG ICID | European Regional Working Group of International Commission on Irrigation and Drainage |
| EUSDR | EU Strategy for the Danube Region |
| GDP | Gross Domestic Product |
| GWP CEE | Global Water Partnership Central and Eastern Europe |
| ICPDR | International Commission for the Protection of the Danube River |
| IRBM | Integrated river basin management |
| ISRBC | International Sava River Basin Commission |
| IWRM | Integrated water resources management |
| IWT | Integrated water transport |
| JDS | Joint Danube Survey |
| NGO | Non-governmental organisation |
| OECD | Organisation for Economic Co-operation and Development |
| OSCE | Organisation for Security and Co-operation in Europe |
| RBM | River basin management |
| RBMP | River basin management plan |
| SAP | Strategic action plan |
| TNMN | TransNational Monitoring Network |
| UNECE | United Nation Economic Council for Europe |
| UNWC | United Nations Watercourses Convention |
| WFD | Water Framework Directive |
| WFE | Water for Food and Environment |
| WWF | World Wide Fund |
| W&WW | Water and Waste Water (services) |

# Foreword

This Technical Focus Paper is one of a series of papers from the GWP regions that provides a critical review of progress made in planning and putting integrated water resources management (IWRM) into practice. The papers synthesise the challenges, the successes, the setbacks, and the direction for further integration. They provide valuable insights from which others can learn lessons that they can apply to their particular and often unique circumstances.

This paper focuses on Central and Eastern Europe. The countries in this region experienced significant change following the collapse of the Soviet Union in 1989 and faced the challenges of becoming European Union (EU) Member States and adopting the stringent EU legal requirements and, particularly, the Water Framework Directive. This has dominated water resources planning and management across Europe and is seen as a surrogate for IWRM because of the many common features they share. But IWRM goes much further than environmental objectives, of course, and embraces sustainable social and economic development. This paper explores what more needs to be done to fully achieve this.

The Global Water Partnership Central and Eastern Europe (GWP CEE) regional and country partners are to be congratulated on the significant contribution they have made in advocating and encouraging this process of integration and involving stakeholders in decision-making across the region, particularly at the macro level.

Our thanks to the authors, who are all members of GWP CEE, for their excellent analysis of what is an extremely complex mix of physical, social, economic, and environmental issues across the region. We would particularly like to thank the lead authors Janusz Kindler, Istvan Ijjas, and Danka Thalmeinerova. We would like to acknowledge József Gayer, GWP Hungary and Richard Müller, coordinator of GWP CEE for their comments and suggestions. We are also grateful to others within GWP CEE for their invaluable support during the drafting stages.

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# Executive summary

Since the collapse of the Soviet Union in 1989, the countries of Central and Eastern Europe (CEE) – Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Moldova, Poland, Romania, Ukraine, Slovakia, and Slovenia – have all sought a pathway from a Soviet era command economy to a free market one with democratic institutions. Individually, they each face their own unique physical, social, economic, and environmental challenges. Most have joined or are planning to join the EU. Thus, not only do they have their economic journey in common, they are each rapidly absorbing and implementing the stringent legal requirements of EU Membership. In the water sector, the environment and water quality requirements of the EU Water Framework Directive (WFD) dominate water resources planning and management. CEE countries see this as a surrogate for integrated water resources management (IWRM) as both have many common features, such as a river basin approach and the involvement of stakeholders in decision-making. But IWRM has a much broader agenda; in addition to the environmental objectives it includes sustainable social and economic development.

The main purpose of this paper is to review the progress being made towards adopting IWRM in CEE countries. But because of the similarities between IWRM and the WFD, and the more immediate importance of the latter for EU Member States, the paper focuses on the progress being made to meet the WFD and assesses what steps, if any, may be needed to go beyond the WFD and put IWRM into practice.

The paper first describes the economic, political, and social transformations which have taken place since the disintegration of the Soviet Union and the dissolution of the Warsaw Pact in 1989, which set the foundations for rebuilding economies and institutions. This is followed by a review of the water resources issues in the region, which are highly variable from country to country both physically and hydrologically. Water demands also vary from country to country for people, industry, agriculture, navigation, and the environment. Droughts and water scarcity are also growing threats. Water in CEE countries, like most of Europe, is assumed to be relatively abundant in comparison to the more arid regions of the world. But weather patterns over the past 15 years are showing that some countries are highly vulnerable to drought and water scarcity. GWP CEE is now pioneering support to governments to develop sound drought strategies.

The paper then explores the relationship between the aims of the WFD and those of IWRM and brings together selected experiences in putting IWRM into practice. GWP CEE, as an organisation, has focused its efforts particularly at the macro level, encouraging a fully integrated approach to water management and full stakeholder participation in decision-making. And there are signs of good progress, driven principally by the WFD. The most striking example is the Danube River Basin in which 19 countries now work together on river management for floods, droughts, and sedimentation issues, and coordinate this with the requirements of ecosystems, agriculture, aquaculture, industry, navigation, and power generation. This river basin has a long history of transboundary cooperation and this has been built upon to provide strong professional and institutional capacity that can cope with the demands of growing nations. It is a model of good practice that is used by many other river basins both within Europe and across the world. Other important examples of good practice stem from this experience in the Tisza and Sava River Basins, which are tributaries of the Danube. The Drin Basin too is a complex transboundary water system with Ramsar-protected wetlands in which stakeholders are participating in planning

through the Drin Dialogue, though some countries are not EU Member States and so are not obliged to meet the WFD requirements.

But equally there are many challenges, exemplified in this review by the Dniester River Basin, which is shared by Moldova and Ukraine – neither are EU Member States. Both countries experience many national and transboundary problems, pollution, and suffer from a lack capacity to effectively share this resource even though the paper agreements are in place.

At the macro level, cooperative approaches are visible in EU development strategies for both the Baltic Sea and the Danube Region where listed priority actions for economic and social development are to be integrated with those of water quality improvements. Cooperation is also promoted in rural development planning where large communities still rely on agriculture for their livelihoods. EU Rural Development Policy is strongly influenced by the WFD, such as solving nitrate leaching problems, and the EU's Common Agricultural Policy. GWP CEE initiated a Dialogue on Water for Food and Environment with the aim of providing policy advice for sustainable development, which promotes an integrated approach across the rural sector.

Similar steps are being taken to integrate water resources planning with inland navigation, which now links the North Sea and the Black Sea, and hydropower development. Both are critically important to sustainable economic development across the CEE countries.

In conclusion CEE countries have many strengths, not the least of which is a cohort of highly qualified water management professionals with high levels of education and training to internationally accepted standards. Progress towards IWRM over the past decade is significant, particularly at the macro level, bearing in mind the starting points for many countries in 1989. But much more needs to be done to coordinate planning at the national and local levels. This is the challenge for the next six-year phase of planning and implementing the WFD.

# 1 CEE's water challenge

Over the past 25 years the countries of CEE have addressed their problems of water resources planning and management within the unique context of the transition they have undertaken from centrally-planned to market economies. Although there are still many challenges ahead, there are clear signs that 12 member countries of the region's Global Water Partnership (GWP CEE), most of whom are now EU Member States (Box 1), are rethinking their water policies as they begin to adopt the EU Directives governing water management. These are crucial legal instruments designed to protect and improve water resources. They include the Water Framework Directive (WFD) 2000/60/EC, the Floods Directive 2007/60/EC, the Urban Wastewater Treatment Directive 91/271/EEC, and the Nitrates Directive 91/676/EEC.

**Box 1. GWP CEE**

Global Water Partnership Central and Eastern Europe (GWP CEE) is a network that unites 12 Country Water Partnerships (CWPs) – Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Moldova, Poland, Romania, Ukraine, Slovakia, and Slovenia. All except Moldova and Ukraine are EU Member States. In turn the CWPs unite partners within the countries (153 partners as of June 2013). GWP CEE was formed in 1998 for the purpose of advocating integrated water resources management (IWRM) and seeking ways of putting this into practice.

One of GWP CEE's key roles is to share experiences of implementing the EU WFD and other water-related EU Directives among the 'young' EU Member States and in particular to help transpose these experiences to non-EU countries in the region. GWP CEE adds value by providing a platform for broad discussion on the urgent needs of countries that are not covered by official national river basin management plans (RBMPs) and finding ways to cover and bridge the gaps.

The WFD is the main driver of change. It was developed in response to the need for a common, coherent, and integrated policy framework for EU Member States to deal with growing problems of water quality deterioration, loss of aquatic ecosystem functionality, and increasing water scarcity throughout Europe. The Directive recognises that addressing these issues is crucial to ensuring long-term water security across the EU.

The WFD is legally binding and incorporates most of the key principles of integrated river basin management. It brings together economic and ecological issues, and incorporates stakeholder perspectives into policy-making. This includes assessments of the ecological, chemical, and quantitative status of waters, setting environmental objectives, designing programmes of measures to achieve them, and monitoring progress. WFD sets out a programme and timetable for Member States to develop river basin management plans (RBMPs) which bring together the statutory objectives for water bodies and the measures needed to achieve them. WFD works on six-year planning cycles. The first cycle will be completed in 2015 with the objective of all Europe's waters reaching 'good' status (Box 2) unless there were justified reasons for not doing so.

The CEE Member States and others are now preparing to enter the second six-year RBMP cycle.

**Box 2. Defining 'good' status of surface water bodies (WFD, 2000)**

'High ecological status' or 'good ecological status' is achieved when the values of the biological quality elements for the surface water body show low levels of distortion resulting from human activity, but deviate only slightly from those normally associated with the surface water body type under undisturbed conditions. If these levels of distortion and deviation become more important, the ecological status will fall to 'moderate', 'poor', or 'bad', depending on the degree of deviation from undisturbed conditions.

'Good chemical status' is recorded when a water body achieves compliance with all the environmental quality standards established in Article 16 (Strategies against pollution of water) and Annex IX (Emission limit values and environmental quality standards) of the WFD, and in other relevant EU Community legislation setting environmental quality standards. If not, the water body shall be recorded as failing to achieve 'good chemical status' and thus be classified as in 'poor chemical status'.

Good overall status is achieved when a surface water body reaches a high or a good ecological and chemical status. The overall status of a surface water body is ruled by the 'one out, all out principle', meaning that the final score for any kind of status is defined by the worst value among its elements or standards (either ecological or chemical).

The WFD is one of the main drivers for changes in water resources management in CEE countries. Clearly many of the principles and objectives of the WFD are synonymous with IWRM, like the river basin approach, the economic assessment of water use, and the involvement of stakeholders in decision-making. But there are differences as well.

The main purpose of this paper is to review the progress being made towards adopting IWRM in CEE countries. But because of the similarities between IWRM and the WFD, and the more immediate importance of the latter for EU Member States, the paper focuses on the progress being made to meet the WFD objectives as a surrogate for IWRM. The paper then assesses what steps, if any, that CEE countries may need to make beyond the WFD in order to put IWRM into practice.

The paper first examines the economic, political, and social transformations which have taken place since the disintegration of the Soviet Union and the dissolution of the Warsaw Pact in 1989 (Chapter 2). The water resource issues in the region are then described including the highly variable physical and hydrological conditions, and the demands for water for people, industry, agriculture, and the environment (Chapter 3). The paper then explores the relationship between the aims of the WFD and those of IWRM (Chapter 4). Experiences of putting IWRM into practice in the region are described and, in particular, the processes of integration at different levels. These experiences are offered as options for others in the region and beyond to consider as they seek to adopt IWRM (Chapter 5). Finally the paper summarises an answer to the question: Where we are up to in adopting IWRM and what are the next steps? (Chapter 6).

# 2 Water policy challenges

## 2.1 The transition

Over the past 25 years CEE countries have gone through immense change as they have striven for territorial restructuring and the building of new national states, managed radical economic transitions from centrally-planned to market-led systems, restructured their institutions, and induced civil society towards a more pluralistic and democratic way of life.

To understand developments in the CEE region is to appreciate that the political, economic, social, demographic, and environmental policy situation has never been and still is far from homogeneous in spite of the 'uniform' approaches to water management during the Soviet era. Thus any attempt to find a general policy pattern underpinning water resources development and management for the whole region is simply not possible.

From the end of the Second World War up to the late 1980s, the so called 'socialist' CEE countries, under Soviet influence, each followed the same pathway in developing their political, economic, and social environment (Offe, 2009). They were dominated by the public sector (state ownership), the State allocated and distributed goods and services rather than the market, and countries were isolated from each other. For more than 40 years these centrally-planned economies focused on raising output through quantitative production targets, with little regard for costs and with under-priced capital and natural resources. Priority was given to expanding heavy industries, often using black and brown coal as the main source of energy.

Under-pricing and excessive use of energy, water, and other raw materials increased and intensified pollution. Even where pollution control installations were in place, poor maintenance and operating practices meant that they were rarely operated efficiently. Only limited steps were taken to improve controls and safety equipment, and operating procedures. The result was that water pollution and degraded water resources and related ecosystems are now one of the most pressing problems in the region.

According to the World Bank, all CEE countries were classified as middle-income. GDP growth was largely generated by industry – automobiles, chemistry, energy, and defence industries. Agriculture was the second largest contributor to GDP. The services sector was almost non-existent. All the countries experienced hidden unemployment, low productivity, and low wage rates. Secure employment was enforced by law. High social security limited migration to other countries together with administrative restrictions on foreign travel.

This situation dramatically changed in 1989 with the collapse of the Soviet Union, and countries began moving towards a market economy. But these changes brought market irregularities and this destabilised some CEE countries. GDP and real wages were reduced, inflation and levels of unemployment reached serious levels. At this point the economic situation within CEE countries started to diverge. The leaders in the transformation process, like Czech Republic, Hungary, Poland, Slovakia, and Slovenia, then Estonia, Latvia, and Lithuania, and ultimately Bulgaria and Romania began strengthening their relations with West European countries and the USA. The

'organic' economic relations with Russia were gradually loosening. Differences showed in GDP per capita, economic growth rates, the share of GDP produced by the private sector, labour costs (wages), unemployment rates and other indices. All these factors were contributing to strengthening international relations in many social and economic areas.

Offe (2009) remarked that all the 'new' CEE Member States that joined the EU in 2004 and 2007 shared the quality of having emerged, after 1989, from the economic, social, and political regime of state socialism. As the transition from state socialism to democratic capitalism is without historical precedent, there was no coherent model or template according to which the transformation was to be conducted. The making of post-socialist welfare states occurred often in a mode of recalibration of existing institutions under many economic and political constraints, and the resulting hybrids being adopted in the various countries that differed both from each other and from the existing, ideologically somewhat consistent welfare states in Western Europe. Conditions in some of the CEE countries were shaped, moreover, by their specific ethnic composition and religious cultures.

In 2015, all 12 CEE countries celebrated their 25th anniversary of regaining independence. The 1990s, when the reforms were contemplated and first stage implementation began, was a time of euphoric expectations of democratisation, reparation of earlier injustice, and the fulfilment of diverse political and social ideals and ambitions (Illner, 1997). But gradually new challenges and difficulties started to appear. One of them, which is directly connected to water resources management, was the development of territorial administration and the system of regional development policy management.

## 2.2 Decentralisation

Transforming the territorial structure of national government, decentralising responsibilities and actions, and introducing territorial self-government, were some of the most important tasks in the process of rebuilding political and administrative systems in the region (Illner, 1997). This process was driven by three principal groups of factors. The first group comprised historic traditions, regional associations, and cultural legacies in each country. Second, were the democratic ideas and beliefs of political actors and their preferences for decentralised power. Finally, there was the prospect of EU accession, particularly the need for candidate countries to adopt entire *acquis communautaire* prior to accession, including the requirements of managing structural funds which have influenced the drive towards decentralisation. But while the EU was a factor, in each case the local circumstances and political dynamics ultimately determined what happened (Yoder, 2003). Thus in some CEE countries decentralisation did not happen as expected. Examples of the transition process and the implications for water management are described in Box 3 and Box 4.

### Box 3. Decentralisation in Poland

In Poland there is a history of regional public administration, but no tradition of decentralising power. In 1990 there were 49 medium-size state administrative regions and about 2,800 communes. Recognising the need for change, the main issue was the number and delimitation of regions. Competencies became the key elements in assessing the success of decentralisation. But in spite of the deliberate structural coincidence of regional developmental and public administrative units, Polish regionalisation initially failed. The new regions were not equipped with competencies and funds; in other words region building was in fact not accompanied by the decentralisation of competencies and tasks (Regulski, 2003). A dual structure of public administration in Poland consists of a *Voivode* (an individual nominated and representing central government in the region) and a Marshall (an elected representative in the region – president of the regional self-government board). The biggest contradiction was the fact that the reallocation of tasks from the national to the regional level was not accompanied by the reallocation of sufficient resources. The limitation of resources made available for the self-government proved to be the major hindrance of the initial performance of several subordinated institutions.

Where the administration of water resources was concerned, the rivers in Poland were divided into 'large' rivers of national importance and 'small rivers important to agriculture'. The administration of 'large' rivers was allocated to the seven Regional Water Management Boards (three upper, middle, and lower segments of the Vistula River and their basins, another similar three for the Odra River, and one for the Silesia coal mining and heavy industry region). All the Regional Water Management Boards were subordinated to the National Water Management Board, which in turn is reporting directly to the Minister of Environment, who is responsible for all water resources in the country.

Where 'small' rivers (about 5,700 tributaries of different categories of 'large' rivers) are concerned, their maintenance and management was left in the hands of special Water Management Units subordinated to the Marshalls operating in 16 administrative regions of the country. In brief, 'large' river water authorities report to the central government, while 'small' rivers and their tributaries, remain in hands of the 16 self-governance units operating in the administrative regions and having nothing to do with the hydrographic boundaries of 'large' rivers. In addition planning was not sufficiently coordinated with the spatial planning also left in hands of the local self-government.

### Box 4. Decentralisation in Slovakia

In 1997, the Slovak Government decentralised state-owned water and wastewater (W&WW) services and transferred the assets to the municipal level. Unfortunately, the process was politically hampered and several times postponed. There were five W&WW utilities subdivided into smaller units without budgetary, development, and planning autonomy. During the decentralisation period, several conflicts and problems occurred. Since 1996, low investment in water infrastructure and operations and maintenance were reported. In practice, the government let the W&WW utilities 'dry out' and allowed their assets to depreciate prior to completing the transfer. Municipalities without water infrastructure in place were excluded from the transformation. Municipalities where water supply and sewerage services were profitable were not willing to join their W&WW companies with other municipalities in the region that were losing money. Municipalities refused to accept facilities under construction as there was no finance to complete the work. Finally, municipalities were reluctant to take over the services because of unclear future development in tax, price, insurance, and depreciation policies. In addition to all this, the Ministry of Finance regulated the maximum prices applied to municipal consumers, which distorted the market in which the W&WW services operators provided services.

# 3 Water resources management

## 3.1 Water supply

Central and Eastern Europe covers a land area of 1.1 million km$^2$ and is mostly located in the Baltic Sea and Black Sea Basins (Figure 1).

Figure 1. The countries of Central and Eastern Europe


Source: GWP CEE.

Several hydrologically independent river basins – the Odra, Vistula, Nemunas, Daugava, Parnu, Matsalu, and the Emajogi – discharge into the Baltic Sea. They are located in Estonia, Latvia, Lithuania, and Poland. Bulgaria, part of the Czech Republic, Hungary, Moldova, Romania, Slovakia, Slovenia, and Ukraine form 65 percent of the total area of the Danube River Basin which flows into the Black Sea. The Danube is recognised as the world's most international river. The separate nature of the Baltic river basins contrasts with the strong interconnections within

the Danube countries. This means that there are very different water resource management issues and priorities across the region.

Water availability varies substantially across the region caused by uneven rainfall distribution and runoff in both time and space, as well as seasonal and year-to-year variability. Slovenia is richest in internal annual renewable water resources (16,100 $m^3$/capita); Estonia (8,050 $m^3$/capita) and Lithuania (4,100 $m^3$/capita) are also well endowed. In contrast, the Czech Republic, Latvia, and Slovakia have much lower water availability and in dry years this can fall below 1,000 $m^3$/capita, which is the established bench mark for defining water scarcity.

Hungary is different. It is rich in water resources because the Danube flows through the country – about 12,000 $m^3$/capita. But only 5 percent of this (600 $m^3$/capita) is from runoff generated within the country itself.

Country-wide and annual average rainfall data do not reflect all the difficulties encountered in water resources management in the region.

## 3.2 Water demand

Water demands are met from both surface water and groundwater. Only 13 percent of the available annual water resource is abstracted, which suggests that overall, there is sufficient water available to meet demand. However, in many locations, overexploitation to support a range of economic sectors poses a threat to water resources, and demand often exceeds availability. Thus problems of water scarcity are widely reported, with reduced river flows, lowered lake and groundwater levels, and drying wetlands.

Households rely primarily on groundwater in Estonia, Hungary, Latvia, Lithuania, Slovakia, and Slovenia. In Poland, groundwater resources supply about half of the urban and 95 percent of the rural household water demands. The Czech Republic, Bulgaria, and Romania rely mainly on surface water for municipal use.

Surface water is mostly used to meet industrial water demands, including cooling water withdrawals for thermal power plants. Irrigation water withdrawals are mostly from surface resources, but these have significantly declined over the past 20 years (especially in Bulgaria, Hungary, Poland, Romania, and Slovakia) because of the structural changes in agriculture. The collapse in the 1990s of many oversized and uneconomic irrigation and drainage systems inherited from the Soviet era also contributed to the decline in irrigation demand. The fate of state-owned large-scale irrigation systems is still one of the major strategic issues facing future rural development.

Across the region, in the past 20 years water use has been falling in all sectors. Initially this was a consequence of a fall in economic activity and the introduction of water pricing. In the early years of transformation, structural changes in the economy meant that several industrial enterprises ceased working or limited their production and this affected water withdrawals. Municipal water use also decreased by as much as 40 percent in some urban areas as water prices and wastewater charges increased and water management technologies improved. One result of this was that existing water supply networks were oversized and this caused water to stagnate and water quality deteriorated.

This tendency towards reduced water use still continues, although in some industrial sectors (like precision machinery) increased water withdrawals are expected in the future. Water withdrawals for agriculture are expected to remain low until the industry undergoes long-term restructuring. Municipal water demands are expected to reduce because water meters are more commonly used and water tariffs are increasing. The CEE region is likely to follow the EU trend, which means further reduction of water use in urban areas. In rural areas some increase is anticipated since the present overall service level is generally low.

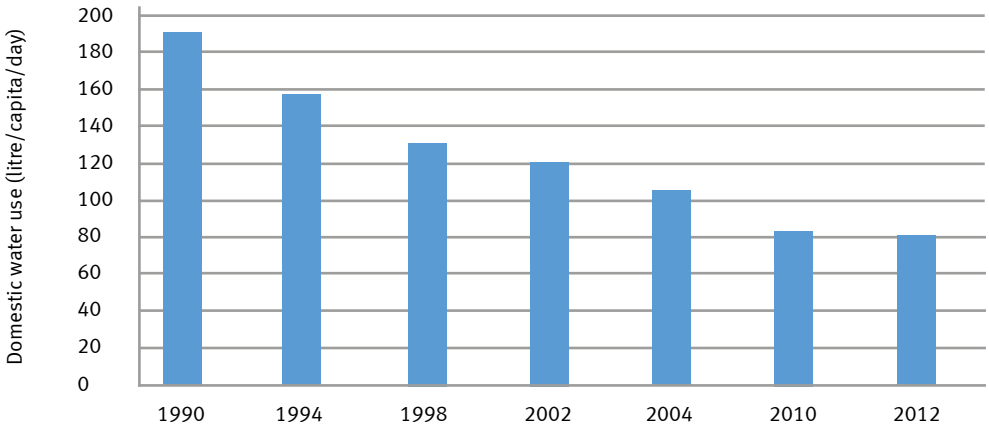
## 3.3 Domestic water supply and wastewater

The water supply coverage in CEE countries is only about 85 percent complete and quality problems often occur. Water supply in small rural settlements is also far from being adequate (less than 50 percent). The issue is closely related to the need to improve development in rural areas.In some CEE countries water losses in the supply systems are still significant. Moreover, large parts of the water supply systems and municipal water supply networks were constructed some 30 to 40 year ago using asbestos-cement pipes.

In all CEE countries, reform in water services' ownership influenced performance. Most countries were faced with multiple reforms ranging from reforms in environmental administration to reforms in municipal governance, health and social systems, and privatisation of most services, such as electricity, gas, and water. The difficulties stemming from the governmental decision to decentralise water services and the lack of capacity at a local level to meet public needs were exacerbated by poor financial discipline at all levels.

In Poland between 1998 and 2012, municipal drinking water use fell by 20 percent. This resulted in companies supplying water and sewage services increasing their charges in order to maintain their services and meet higher water quality standards of receiving waters. Over the past 14 years water supply costs increased by 145 percent and sewage disposal costs increased by 220 percent. On average, people in Poland are spending 2.1 percent of their income on water supply and sewage disposal. A similar situation exists in Slovakia (Figure 2). In 1990, water use was almost 200 L/capita/day, but by 2014 it had fallen to 77 L/capita/day.

Figure 2. Trend in domestic water use in the Slovak Republic




Source: GWP CEE, 2007 and website of the Slovak Ministry of Environment (http://www.minzp.sk/en/).

## 3.4 Water quality

Water pollution is one of the most pressing problems that CEE countries have inherited. The poor quality of surface and groundwater resources in the CEE region is well documented. Indeed, in the early 1990s, the availability of water resources to meet human and ecosystem needs was seriously threatened by continually degrading resource quality. Health risks from poor water quality were much greater than those accepted in the Organisation for Economic Co-operation and Development (OECD) countries. Also the economic costs of water quality degradation were substantial.

In 2009, the status of water across Europe was assessed when all EU Member States produced RBMPs for the first time. This assessment reported that more than half of the surface water bodies across the EU had less than 'good' ecological status or potential, and would need mitigation and/or restoration measures to meet the objectives of the WFD. A large percentage of these water bodies were in the CEE region. Here, as in other parts of Europe, the most common pressures affecting surface water bodies are pollution from point (urban) and diffuse (agriculture) sources causing nutrient enrichment, as well as hydromorphological pressures causing changes in habitats.

Poor chemical status is also a problem affecting more than 20 percent of rivers and lakes. The principal causes are pollution from by-products of fuel burning (polycyclic aromatic hydrocarbons), heavy metals, and industrial chemicals, such as pesticides. Water pollution from nitrogen and phosphorus compounds comes typically from their emission via urban wastewater (point sources) or from their use in agriculture as fertiliser (diffuse sources).

All EU countries must also comply with the EU Urban Waste Water Treatment (UWWT) Directive (EC, 2012a). The objective is designed to protect the environment from the adverse effects of urban wastewater discharges and biodegradable industrial wastewater from the agro-food sector. Most EU Member States have achieved 94 percent compliance, but four CEE Member States still have compliance rates below 30 percent. In all CEE countries this Directive is exceptionally challenging to implement because of the financial and planning implications of major infrastructure investment in sewerage systems and waste water treatment facilities. In Poland, the National Programme of UWWT was initiated in 2003 and is now planned for completion in 2015 at a cost of EUR 7 billion – EUR 4.5 billion for the urban waste water systems, EUR 2.2 billion for the treatment plants, and EUR 0.3 billion for sludge management installations.

Agriculture contributes substantially to the overall nutrient load in both surface water and groundwater. Even in the River Danube, with its high discharge and dilution rates, concentration of nutrients is high and eutrophication is visible, particularly along the lower stretch of the river. Eutrophication of inland and coastal waters is still a problem in many CEE countries. The problems of ammonia volatilisation, nitrate leaching, phosphorus leaching, and soil erosion, and discharges of farm waste, such as effluent from animal houses, manure storage, and silage heaps, are still not at the desired level in many parts of the CEE.

Poor handling and management of commercial fertilisers is still a problem for CEE agriculture (Eurostat, 2015). Since the 1990s, price increases for fertilisers and pesticides have significantly reduced their use and average consumption of fertilisers per hectare is now considerably lower in CEE countries than in the 'old' EU countries. But recent reports show that although between

2000 and 2012 total nitrogen fertiliser use decreased significantly in the 'old' EU countries, it increased in Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Poland, and Slovakia. Similar increasing trends were noticed for phosphorus use in Bulgaria, Poland, Romania, and Slovakia.

Two primary monitoring programmes help countries to cope with assessing water quality – the surveillance monitoring and the operational monitoring networks for surface waters and groundwater. Current monitoring observation stations in the CEE do not meet these requirements and so all national water quality monitoring systems are gradually being modified. However, many are behind schedule, which leaves many water bodies with unknown status. The main reason is lack of finance for hydrological and meteorological services.

## 3.5 Droughts and water shortages

CEE countries are affected by droughts, which are becoming longer-lasting and severe in their impact. The public, governments, and operational agencies are alert to this vulnerability and to the many socio-economic problems that come with water shortages and the need for drought mitigation measures. Climate change just adds to the problems of droughts and is likely to increase both their frequency and severity. The most probable future climate development is directed towards warmer and slightly drier summers, warmer winters with unchanged average levels of annual rainfall, and increased frequency of extreme weather events.

In 2003, low rain and snowfall in the Danube River Basin and in upstream countries caused water levels in the Danube River to fall to their lowest for over a century, stranding ships and barges from southern Germany to the Romanian lowlands. Romania's Cernavoda nuclear power plant, which draws cooling water from the Danube, was forced to shut down for nearly a month.

Annual evapotranspiration in the Danube Basin is 500–600 mm and can exceed annual precipitation. Supplementary irrigation is meant to prevent damage to agriculture, but the large-scale systems in the south-east of the region, constructed during the Soviet era, are now mostly abandoned.

Frequent droughts in the Carpathian region in Hungary results in significant economic damage with 30–60 percent crop yield losses. Drought is an issue in Bulgaria, Hungary, Poland, Romania, Slovakia, and Ukraine (Box 5).

In Poland, in dry years, the annual runoff from the international Vistula and Odra River Basins may be 50 percent less than the mean. The situation is made especially difficult when several dry years come together. The river basins of Estonia, Latvia, and Lithuania are better endowed than Poland. But in dry years, local shortages can and do develop. These are not so serious in terms of water volume, but more serious in terms of deteriorating water quality. In Latvia, the largest rivers – the Daugava, Venta, and Lielupe – originate in neighbouring countries and bring noticeable pollution loads.

**Box 5. GWP/WMO Integrated Drought Management Programme**

In 2013 the UN World Meteorological Agency (WMO) and GWP jointly launched the Integrated Drought Management Programme for Central and Eastern Europe (IDMP CEE) involving more than 40 organisations from 9 CEE countries.

This programme is a coordinated regional framework for drought monitoring, early warning, prediction, and management plus a set of guidelines and tools for developing regional, national, and local drought policies and plans. It was to advocate, facilitate, and integrate responses from various agencies in sectors such as water, land, agriculture, ecosystems, and energy.

The Programme promotes horizontal integration of efforts by water specialists working together with those representing the meteorological and hydrological services, agriculture and energy sectors, forestry services and others. Management actions need to be coordinated at all scales – regional, national, and local. The subsidiarity principle must be respected, but drought policy and finance decision-making must be taken at the appropriate higher levels.

This is a unique programme that focuses on integrated approaches rather than fragmented solutions. It closes in 2015.

Source: www.gwpcee.org

## 3.6 Floods and flooding problems

Extreme floods occur every 10–12 years and are usually caused by a number of factors coming together, such as local storms, unusual areal rainfall patterns, and high soil moisture content. The Danube floods every 2–3 years and in the middle stretch of the river the high to low flow ratio is about five. Its tributaries are more volatile with a ratio of 50 for the Tisza River, which floods every 1.5–2.0 years, and 500 for many small to medium rivers. Coping with floods on the Tisza River and its tributaries causes the river bed to silt, and remedial works to resolve the problems are complex and require the construction of emergency reservoirs and relocating dykes.

Flood management systems in the Danube Basin are well developed, though maintenance is not always satisfactory and the monitoring network needs improving in the eastern part of the basin. Many settlements, railway lines, public roads, industrial plants, and a significant portion of the region's GDP is protected. It is generally believed that constructed civil engineering works reduce the consequences of severe floods, but such events do still occur and cause substantial economic and social damage.

In 2010 serious flooding occurred in both the Baltic Sea and Danube River Basins as a result of poor weather conditions during May and June. Poland was worst affected, but Austria, Czech Republic, Germany, Hungary, Slovakia, Serbia, and Ukraine were also affected when two months of rainfall fell in 24 hours. The Polish city of Krakow declared a state of emergency. The flooding lasted several days and escalated when the Vistula River broke its banks. The Czech Republic reported the heaviest rain for eight years. However, historical parts of Prague were not damaged, due to the efficiency of flood defence measures constructed since the 2002 devastating flood. In Hungary several roads became impassable. Rescue assistance was provided by the other EU nations. Flood management is one of the most serious national issues as seen in 1997 when flood losses reached about USD 10 billion.

In Lithuania spring floods result in heavy financial losses, mostly in the delta of the Nemunas River. These floods occur even during the low flow years, because of ice jams in the Belorussian part of the Neman River Basin. Water accumulates in the lowlands and local depressions during the intensive and often long lasting rainfall events.

By end of 2015, all the EU Member States are expected to have implemented the EU Floods Directive adopted in 2007. This requires that preliminary flood risk assessment, flood maps, and flood risk management plans are prepared in cooperation and coordination with neighbouring states in cross-border river basins, and with the implementation of the WFD. The Directive also requires an active involvement of key stakeholders in the planning process. In Slovakia, as in other CEE countries, the process is formal and municipalities that are faced with potential flood damage are not always fully engaged or even informed and so have limited opportunities to provide support.

A further challenge is to integrate flood risk management with the WFD planning cycle and to make synergies rather than duplicate tasks and set up potentially conflicting measures. This is an issue that has yet to be dealt with.

## 3.7 Laws, legislation, and institutions

In Western Europe water-related legislation has gradually evolved over many decades, but CEE countries were only given 2–4 years to transpose EU legislation and go through major changes as they joined the EU. These changes had a significant influence on the environment, water, energy, navigation, agriculture, and regional development.

In many CEE countries, water administration at the policy level falls within at least two ministries. This weakens water governance and leads to fragmented decision-making because the coordinating mechanisms are weak or overly formal. There are no clear mandates for managing water at a horizontal level and municipal and county responsibilities often overlap with decisions made by sector ministries.

The following are some examples of the fragmented approaches to legal and institutional issues governing water management in the region and they express the urgent need for a more integrated approach.

In Slovakia, decisions on land use planning are made separately from those for water and the environment even though they are all inextricably linked. Land use planning is coordinated by municipal authorities. But sector planning, such as RBMPs, Nature Conservation Plans, and Solid Waste Management Plans, is the responsibility of the Ministry of Environment (and water) which administers the county districts.

In Slovakia, although municipalities play a key role in water management they are largely excluded from water management planning and decision-making at national government level. Public funds for water infrastructure are under the control of the national government even though the municipalities are the primary beneficiaries. EU funds to support nature conservation are also administered by government rather than the municipalities, who were seen to be a problem rather than part of a solution.

In both RBMP cycles in 2007 and 2015, the Slovak Environment Ministry has used the Water Management Research Institute to publish a review of the most significant water management problems rather than engaging with municipalities. This, even though the municipalities have significant responsibilities for water services and for spatial, economic, and social planning at the local level. The municipalities expressed their concerns about their lack of participation and integration in water planning and with other water use sectors. In 2009 this dissatisfaction culminated in a report published by the Association of Municipalities and Villages – *Principles of Integrated Water Resources Management in Municipalities and their River Basins*. This was designed to alert the Slovak government to make decisions that lead to sector and interdisciplinary cooperation at the local level. In 2015 the Association has become a strong partner in the development of the National Water Plan, bringing key non-governmental organisations into the planning process.

These are just some of the concerns which drive GWP CEE to influence a process of change and the adoption of a more integrated approach.

## 3.8 Similarities, differences, and country specific issues

National differences among principal water management objectives and characteristics are substantial, and it is difficult to make general statements about the region as a whole. The following demonstrates some similarities, differences, and country specific issues.

Water resources in the four Baltic countries are generally dealt with separately as only a few basins are shared. However, there are a number of common issues which require similar solutions, such as protecting the quality of the Baltic Sea. Some transboundary issues need resolving, such as between Latvia and Lithuania, and also with countries not included in this review, such as Belarus and Russia.

Eight GWP member countries are connected by the Danube River and are signatory parties to the Danube River Protection Convention. Consequently there is a strong focus on solving transboundary issues. However, this is never an easy task as governments must also focus on national problems of higher priority for the local population and these may cause conflicts between nations.

Estonia, Latvia, and Slovenia are countries with relatively abundant water resources and most of their water problems are on the 'demand side' of water resources management (e.g. quality of drinking water, obsolete water supply and sanitation infrastructure, and inefficient small water utility companies).

Some Baltic Sea Basin countries, such as Poland and Lithuania, have both demand and supply problems, although geographically located in the northern part of Europe. The supply problems are especially acute because of the considerable year-to-year variability of water resources. Persistent water shortages in some parts of these countries cause resource allocation problems, conflicts, and competition between different water users.

Water quality of both surface and groundwater is still a common problem for all countries of the region. The problem is multidimensional – legal (environmental liability), technological,

informational, and institutional. Pollution through inadequately controlled discharges of municipal waste and from industry and agriculture gives rise to risks to human and ecosystem health alike.

Flood management is a problem in most countries within the Danube Basin. Most current flood protection is based on flood levees, with relatively small flood capacities in storage reservoirs. The number of storage facilities is limited given the region's predominantly flat topography. Poorly controlled urbanisation, land use changes, and economic developments in the floodplains as well as institutional weaknesses are considered to be major causes of high flood losses.

Water-related institutional arrangements in all CEE countries are considered over-complicated, lacking in transparency, and are not financially self-supporting. Economic, regulatory, and institutional arrangements need to be strengthened at regional, national, river basin, and local levels to make them compatible with the new political and economic realities.

The principle of river basin management is well known across the region and well embedded into the national institutional structures, but suffers from frequent governance changes (reshuffling of the structure).

During the Soviet era, planning was more concerned with investment and central implementation, whereas today the need is for an emphasis on management instruments and implementation.

## 3.9 Some key challenges

The European Environment Agency has identified the three most critical areas for the future health of CEE water resources and related ecosystems – land use, energy, and water governance (EEA, 2012). Land use, land management, and regional (spatial) development of landscapes are the main driving forces that threaten the resilience of water systems. In terms of European and national legislation, the most important policy areas for securing water resilience are the new Common Agricultural Policy (CAP) and the policies for regional development detailed by the European Commission in Territorial Agenda 2020. This document stresses the importance of environmental and water concerns in regional development. Agriculture and regional development all create pressures on water quality and water quantity. The CAP and cohesion policy need to better integrate water quality objectives to reduce these pressures.

Water and energy are inextricably linked as economic resources. The impact of energy production on water needs to be reduced. This can be accomplished by careful planning of biofuels, hydropower, and unconventional recovery of oil and gas while fully applying all environmental assessment tools. Placing proper prices on water and energy can also help to improve the effective use of water resources.

For water governance (OECD, 2015), there needs to be better 'vertical integration' at different levels of administration, such as local, regional, national, and European. Better 'horizontal integration' of water stakeholders and the water-using sectors is also needed.

# 4 IWRM vs EU WFD

The WFD is sometimes called the 'IWRM of the North' and is seen as Europe's way of implementing IWRM. They are synonymous in many ways, but equally there are differences between the two. IWRM is a response to the need for improved water governance whereas WFD focuses more on environmental protection legislation.

Within the CEE region, the WFD is seen as a core policy element for IWRM and, as such, it is a key tool for water policy integration, which specifies water protection targets in balance with economic interests. There is much common ground, such as the basin approach, public participation, the precautionary principle, and transparency (INBO, 2006), but WFD alone is not sufficiently balanced with socio-economic development goals as is encouraged by the IWRM approach. There are, of course, many other directives, economic sector policies, and conventions to be taken into account for a comprehensive integrated approach to environmental, economic, and social development.

## 4.1 River basin management planning

River basin management plans (RBMPs) provide the mechanism for EU Member States to implement the WFD. The WFD sets clear guidelines on how to produce, review, and update RBMPs in order to achieve the environmental objectives. It stipulates the need to include water users and other stakeholders in the planning process, though it lacks clear guidelines on how to do so. Goals towards economic and social development are not emphasised as these objectives are seen as the responsibility of Member States. So too are the issues of gender and poverty, which are not seen as such pressing issues in water management as they are in less developed countries. As the WFD deals with European conditions, water is assumed to be relatively abundant, in comparison to the more arid regions of the world, and that adequate water infrastructure is in place to effectively manage water resources (Larsen, 2005; INBO, 2006).

Implementing IWRM, the WFD, and RBMPs is influenced by the specific and highly diverse hydrological and economic conditions, geographical circumstances, socio-cultural factors, government structures, traditions, and national cultures.

EU Member States are expected to take an integrated approach, particularly bringing together the water interests of agriculture, rural development, municipalities, energy, transport, tourism, climate adaptation, and nature conservation in order to identify the most cost-effective combinations of measures to achieve environmental, social, and economic objectives.

Table 1 summarises the two approaches to integrated river basin management (IRBM) – to meet both the WFD objectives of good environmental status and the broader social and economic objectives implicit in IWRM.

**Table 1. Approaches to integrated river basin management (IRBM)**

| Type of IRBM | IRBM for WFD objectives | IRBM for national objectives |
|---|---|---|
| Types of objective | Environmental objectives; mandatory | Social and economic objectives; non-mandatory |
| Objectives | Common European environmental objectives. Good status of all surface and ground waters; good status of protected areas | European, national, regional, and local social and economic objectives: sustainable water use/water services |
| Legal background | EU Water Policy; EU WFD; related directives | National policies, strategies, action plans and laws. EU policies, strategies, action plans; EU Flood Risk Management Directive; international agreements |
| Types of planning | RBMPs under the WFD | National, regional, and local plans including coordination of sector plans (rural development, spatial planning, drought management plans, climate adaptation, and flood risk management plans) |
| Deadlines for achieving objectives | 2015, 2021, and 2027; mandatory | No common deadlines; not mandatory |
| Planning guidance | EU CIS guidance documents – more than 30 guidance documents covering various aspect of WFD<br><br>International Commission for the Protection of the Danube River (ICPDR) guidance documents | National/international guidance documents, handbooks, manuals<br><br>GWP ToolBox for guidance on IWRM<br><br>ICPDR manuals for sustainable navigation and sustainable hydropower production |
| Planning outputs | Programmes of measures to achieve environmental objectives | Programmes of measures to achieve the social and economic objectives |
| Monitoring objectives | Monitoring environmental indicators | Monitoring indicators for water use and water services |
| Target groups | Ecosystems (good status); citizens (human security – good health) | Citizens/stakeholders; interest groups |
| Public participation | Mandatory | Optional; mandatory for so called 'interested parties' – direct water users |

Source: Ijjas, 2014.

## 4.2 EU level support

Since 2001, support for CEE countries, as they seek to implement the WFD, has come from a significant, though informal, cooperation under the Common Implementation Strategy (CIS). This is led by Water Directors of EU Member States and the EU Commission. The CIS has successfully delivered more than 30 guidance documents and policy papers with the active participation of experts from the CEE countries. This has been a valuable platform for exchange of experiences and best practices among Member States and candidate CEE countries.

The CIS is currently the platform used by EU Member States and the EC to facilitate implementation and provides a common interpretation of the WFD. This mechanism of

cooperation has been used as a model in other environmental sectors supporting the implementation of environmental *acquis*[1].

The European Parliament and the European Council require regular assessments of progress in implementing the WFD (Box 6). The public has free access to the assessment reports.

**Box 6. Third assessment report on implementing RBMPs**

The EC's third implementation report under the WFD (EC, 2012b; EC, 2013b) is based on the assessment of the RBMPs and is an integral part of the new water policy document of the EU – the *Blueprint to Safeguard Europe's Water Resources*. The assessment is based on the information provided by EU Member States – published RBMPs and accompanying documentation, and electronic reporting through the Water Information System for Europe.

The report says that a large proportion of water bodies have unknown status. Monitoring is insufficient and inadequate in many countries, not all priority substances are monitored, and the number of water bodies being monitored is limited. The report indicates progress towards the objective of good status by 2015, but it will not be achieved for a significant proportion of water bodies. The chemical quality of water bodies has significantly improved in the last 20 years, but the situation regarding priority substances listed in the WFD falls short of the objective.

### 4.2.1 Information exchange tools

The European Commission promotes information exchange and facilitates the work of experts through an internet-based platform – the Communication and Information Resource Centre for Administrations, Businesses, and Citizens (CIRCABC). (It was originally called CIRCA.) It is used to create collaborative workspaces where communities of users can work together and share information and resources.

In the water sector, the key achievement was the establishment of the Water Information System for Europe. This is an important information tool for EU organisations and citizens. It was launched in 2007, and provides a web portal entry to water-related information and data on all European waters including pollution, ambient river quality, and groundwater. It includes general information for the public.

### 4.2.2 Integrating water policy with other sector policies

The energy, water, and climate sectors are highly developed, but only a limited effort is made to manage the links between them. Planning land use, agriculture, urban development, hydropower, navigation, and flood protection all have potentially negative impacts on water resources. Thus the WFD and the RBMP processes offer a unique opportunity to create the interactions needed among these related sectors.

Implementing the WFD requires integrating water policy objectives into the development and economic planning activities that rely on water. The WFD Article 4.7 on new projects and modifications to water bodies, frames the conditions under which trade-offs between water protection and economic developments can be established.

[1] The *acquis* is the accumulated legislation, legal acts, and court decisions which constitute the body of European Union law.

Arrangements for coordination in order to resolve overlaps and inconsistencies between the requirements of different directives and sector strategies are not in place in many CEE countries. There are also inconsistencies between the countries in their legislation for implementing the directives, which hinder transboundary assessments for coordinating and harmonising water resources management.

### 4.2.3 Water pricing and cost recovery

The WFD explicitly states that EU Member States shall ensure that water pricing policies provide adequate incentives for users to use water resources efficiently, and thereby contribute to the environmental objectives. Cost recovery establishes the overall amount that users are charged for water services. The WFD foresees an adequate degree of recovery not only of the financial costs for providing water services, but also of the costs associated with negative environmental effects (environmental costs) and the forgone opportunities of alternative water uses (resource costs).

All Member States report that considerable work has been done to calculate financial costs and estimates of cost recovery for water services based on the principle that the 'beneficiary pays'. But there is less progress in estimating and integrating environmental and resource costs, which are based on the principle that the 'polluter pays'. Some 19 Member States are reported to be considering these costs. One constraint is the lack of practicable methodologies.

# 5 IWRM experiences

The UNEP report (2012) provided a global overview of the progress being made towards adopting an integrated approach to water resources management and included contributions from CEE countries. Nevertheless, there is as yet no specific status report available on the experiences of applying the principles of IWRM in CEE countries and of implementing the WFD and RBMPs, even though they have long experience of water management planning.

However, the following are some specific experiences available from selected CEE countries (GWP, 2014; EMLA, 2010; Ijjas and Szlávik, 2000). The main focus is the Danube River and its tributaries and the experience in planning and managing the complex transboundary issues along these important waterways.

## 5.1 Danube River Basin

Transboundary basins present particular challenges for IWRM. The Danube River Basin (DRB) has a long history of transboundary cooperation and is often known as the 'most international river basin in the world' (Figure 3). The basin includes 19 countries, over 81 million people, some 20 percent of the EU land area (approximately 800,000 $km^2$), a wide range of diverse landscapes, and major socio-economic differences among the many nations.

Today, scholars of international law often identify this basin as the place where international organisations first evolved (ICPDR, 2014). As early as 1616 an Austro-Turkish treaty granted Austrians the right to navigate the middle and lower Danube. In 1774 a treaty allowed the Russians to use the lower Danube. In 1856, the Treaty of Paris created the first, and for many years the only, international body – the European Commission of the Danube – with significant

Figure 3. Danube River Basin


Source: ICPDR.

powers to guarantee freedom of commerce and navigation along the Danube for all European countries. Cooperation under this Commission continued until the middle of the 20th century.

In 1992 the United Nations Economic Commission for Europe's (UNECE's) Convention on the Protection and Use of Transboundary Watercourses and International Lakes was signed. It served as a model for the Convention on Cooperation for the Protection and Sustainable Use of the Danube River signed in 1994 and provided the legal framework for cooperation on water.

Adopting an integrated approach to water management when preparing and implementing the Danube River Protection Convention (DRPC) was a real challenge. It involved countries with differing histories, languages, and cultures as well as diverse water interests.

A significant proportion of the water resources is environmentally damaged or under threat and so needs protecting, and improving water quality is a substantial task for achieving sustainable development. The Convention provided a solid base for cooperation and was a stimulus for international funds to co-finance many environmental investigations and studies and allowed a wide range of organisations to cooperate (Ijjas, 2011). These included:

- The Danube … for whom and for what, Equipe Cousteau (1992)
- Danube Integrated Environmental Study, Environmental Programme for the Danube River Basin, EC PHARE-Programme (1993–1994)
- Strategic Action Plan (SAP), Environmental Programme for the Danube River Basin (1994) and SAP Implementation Plan (1995)

- Danube Nutrient Reduction Programme (1997–1999)
- ICPDR Joint Action Plan (2000–2005)
- EC supported Danube–Black Sea programme (specific reports in 2002 and 2004)
- EU WFD Danube River Basin Analysis (2005)
- UNDP/GEF Danube Regional Project (2001–2006)
- UNDP/GEF/ICPDR Danube River Basin Updated Transboundary Diagnostic Analysis Based on EU Water Framework Directive – Analysis Report (2006)
- Danube River Basin Management Plan (2009)
- Second Danube River Basin Management Plan – Draft (2014–2015).

All Danube countries with territories greater than 2,000 km$^2$ are Contracting Parties to the Convention. These include Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Moldova, Montenegro, Romania, Republic of Serbia, Slovak Republic, Slovenia, and Ukraine (Box 7). The EU is also a Contracting Party to the Convention. The International Commission for the Protection of the Danube River (ICPDR) is the organisation established by the Convention's Contracting Parties to facilitate multilateral cooperation and for implementing the Convention. Among other activities, the Contracting Parties have agreed to periodically assess the quality conditions of the Danube River (Box 8).

The ICPDR is now the largest international body of river basin management experts in Europe, with a mission to promote and coordinate sustainable water management in the Danube Basin. This is a model of transboundary cooperation that can guide the actions towards sustainable development in transboundary river basins across the world.

**Box 7. ICPDR and UN Watercourses Convention**

The UN Watercourses Convention (UNWC) came into force in 2014, some 17 years after it was adopted. The Convention constitutes a global legal mechanism for facilitating the equitable and sustainable management of transboundary rivers and lakes. It is a new tool for improving transboundary water cooperation worldwide. ICPDR, as one of the world's most developed transboundary basin organisations, will continue to promote and support the UNWC globally, offering inspiration and lessons learned from the Danube experience.

Source: ICPDR, 2014.

In 1994, when the DRPC was signed, Germany was the only contracting party that was also an EU Member State. By 1998, when the ICPDR began its work, Austria had also become an EU Member State. Today, 9 of the 14 countries in the Danube region are EU Member States. One of the main changes for new members of the EU is water legislation – harmonising national water management legislation with EU legislation.

In 2000 all ICPDR contracting parties agreed to coordinate the WFD implementation in the Danube Basin and in 2007 this agreement was extended to include the Floods Directive.

The DRPC is referred to as an example of good IWRM practice. It is effectively coordinated by the ICPDR. The Danube Basin has a transboundary RBMP (ICPDR, 2015a, b, 2009), and the first-ever transboundary climate change adaptation strategy. This experience is shared with others as part of a global network of basins working on climate change adaptation. ICPDR is considered a world leader in linking water with related sectors having developed guidelines on sustainable waterway and sustainable hydropower planning together with interest groups.

**Box 8. TransNational Monitoring Network of the Danube River Basin (TNMN)**

The TNMN was designed in 1993 under the project *Monitoring, Laboratory Analysis and Information Management for the Danube River Basin*. The contracting parties established a joint monitoring system, and agreed upon monitoring points sources of pollution, river quality characteristics, and pollution parameters to be regularly evaluated for the Danube River and its main tributaries. A concern was also underlined regarding typical emissions of pollutants discharged within the respective catchment areas. In addition, the Parties were to periodically assess the quality conditions of the Danube River and the progress made by the measures taken to prevent, control, and reduce transboundary impacts.

Source: GWP ToolBox case study No. 390 (www.gwptoolbox.org).

Countries within the Danube Basin have also benefitted from being part of ICPDR's expert groups where lessons are exchanged and new solutions that have improved the IWRM implementation are discussed. The ICPDR is the only international mechanism to engage in a dialogue with stakeholders and invites observers to join in its work. To date, 22 organisations hold observer status, including GWP CEE, and represent the full spectrum of water interests (ICPDR, 2014)[2].

### 5.1.1 Good practices for river basin management (RBM) planning and coordination

RBM planning and coordination for large river basins requires special attention and understanding (Ijjas, 2004a, b) and so the River Basin Management Expert Group of ICPDR was given the responsibility of identifying good practices that were appropriate for the Danube Basin. The objective was to provide help for realistic and reasonable preparations for the Danube level RBMP and coordination and to define the essential critical tasks. These include:

- Selecting the issues affecting the whole Danube River Basin District (DRBD)
- Selecting the best applicable practices
- Drafting a proposal for the contents of a guidance document on RBMP and coordination in large river basins.

Three main levels of planning and coordination were identified:

- Danube River Basin level (issues affecting the whole DRBD)
- Bilateral/multilateral level (issues with bilateral, multilateral transboundary effects)
- National level (all other issues regarding implementation).

It was agreed that Danube level planning and coordination would be limited to what was absolutely necessary. Key issues at this level include:

- Selecting pressures and impacts
- Selecting water bodies for analysis of the pressures and impacts
- Assessing the status of selected water bodies
- Designating programmes of measures for selected water bodies
- Public participation and stakeholder involvement.

[2] Black Sea Commission, World Water Fund for Nature, International Association for Danube Research, Viadonau, European Anglers Alliance, Carpathian Convention, DANUBEPARKS, International Sava River Basin Commission, Global Water Partnership Central and Eastern Europe, Regional Environmental Center for Central and Eastern Europe, International Association of Water Supply Companies in the Danube River Catchment Area, Danube Environmental Forum, Central Dredging Association, Danube Commission, Danube Tourist Commission, European Water Association, Friends of Nature International, International Hydrological Programme of UNESCO (IHP/Danube), Ramsar Convention of Wetlands, VGB PowerTech eV.

### 5.1.2 Joint Danube survey

Since 2001 a Joint Danube Survey (JDS) has been carried out every six years. In 2013, the third JDS report produced the largest volume of knowledge on the Danube River Basin ever collected in a single experience (ICPDR, 2015c). An international team of 20 scientists collected samples at 68 sites over 6 weeks. The data were organised in three inter-related assessments of the river – biological, chemical, and hydromorphological – to determine if the status of waters had improved or deteriorated. The results are pending.

The ICPDR's JDS is influencing others to follow this approach. The Orange-Senqu River Commission is currently organising a similar river survey, based on collaboration with the ICPDR.

### 5.1.3 Danube RBMP to achieve 'good' status for Danube water bodies

In 2010 DRB Water and Environment Ministers adopted the Danube RBMP (ICPDR, 2009), which outlined the concrete measures to be implemented by 2015 to improve the environmental conditions along the Danube River and its tributaries. The measures included reducing organic and nutrient pollution, offsetting the negative environmental effects of man-made structural changes to the river, improving urban wastewater systems, introducing phosphate-free detergents in all markets, and effective risk management of accidental pollution. Further measures to restore river continuity for fish migration and reconnecting wetlands were also planned.

Although not all Danube countries are EU Member States and are not legally obliged to fulfil the WFD requirements they have all agreed to adopt and implement the WFD. The five non-members are Bosnia and Herzegovina, Moldova, Montenegro, Republic of Serbia, and Ukraine.

The DRBMP identified four significant transboundary issues that affect both the Danube River and the Black Sea:

- Nutrient pollution – leading to over-enrichment by nutrients and eutrophic conditions
- Organic pollution – leading to low dissolved oxygen levels in the receiving water
- Hazardous substances – leading to environmentally toxic conditions
- Hydromorphological alterations – leading to a loss of wetlands, negative impacts on natural aquatic conditions, and present migration barriers for fish.

During the 1970s and 1980s, the trophic status of the Black Sea, and particularly the north-west shelf increased dramatically. The ICPDR and the UNDP/GEF programme agreed upon both short- and long-term targets for recovery:

- Short-term – to avoid nutrient loads being discharged into the Black Sea which exceed those that existed in 1997
- Long-term – to reduce the nutrient load discharged to levels allowing the Black Sea ecosystems to recover to conditions similar to those of the 1960s.

### 5.1.4 Second Danube RBMP – Update 2015

In 2014, the second RBMP cycle was launched and will be finalised in December 2015, taking into account the results of a six-month public consultation process. More detailed plans are being prepared at national levels.

Water bodies are the basic management units for assessment within the WFD and their delineation is being revised for this second cycle. All Danube countries – except Montenegro – have completed or are near completing this task. They were identified and updated based on an analysis of the pressures on resources and on the monitored data. Moldova has identified the number of water bodies focusing on the Prut River Basin and Ukraine has done a similar task for the Tisza and the Prut River Basins. Some 59 water bodies are identified on the Danube River, and 644 water bodies on the tributaries within catchments exceeding 4,000 km$^2$. Five lake water bodies are delineated and, overall, two transitional and four coastal water bodies were reported. All other water bodies are dealt with in detail in the national reports.

Since the adoption of the first DRBMP in 2009, more intensive work has been undertaken and additional issues investigated in order to identify their relevance and significance at a basin-wide scale. These include sediment quality and quantity, invasive alien species, adaptation to climate change, water scarcity and drought, and concerns about sturgeon. Furthermore, new activities were launched to enhance inter-sector cooperation, especially inland navigation, sustainable hydropower, and agriculture, and linkages between the WFD and the marine environment covered by the EU Marine Strategy Framework Directive 2008/56/EC. These sector policies are closely interlinked with the significant water management issues[3] – infrastructure projects for navigation, hydropower, and flood protection; hydromorphological alterations; and agricultural activity including organic pollution, nutrient pollution, and hazardous substances pollution.

More than 80 percent of the Danube is regulated for flood protection, and 30 percent of its length impounded for hydropower generation. About half of the Danube tributaries are used to generate hydropower. In total, hydropower plants in the Danube Basin produce 30,000 MW.

There are 1,018 barriers located on DRBD rivers within catchment areas in excess of 4,000 km$^2$. Some 598 are dams/weirs, 296 are ramps/sills, and 124 are classed as other types of interruptions. About 47 percent cause a water level difference of less than 5 m under average conditions, 21 percent cause a water level difference between 5 and 15 m, and 6 percent are larger dams with water level differences of more than 15 m. By 2015, 335 of the barriers will be equipped with functional fish migration aids, but 628 will remain a hindrance for fish migration and are currently classified as significant pressures.

**Box 9. Integrating DRBMP with flood risk management plan (FRMP) for the Danube River Basin**

The Floods Directive 2007/60/EC aims to reduce the flood risk in EU water courses and coastlines by mapping the flood extent and assets and humans at risk and to take adequate and coordinated measures to reduce the risk. This Directive also reinforces the rights of the public to access this information and to participate in the planning process. The Directive is a response to the series of major and catastrophic flood events between 1998 and 2006, including the floods along the Danube and Elbe Rivers, and the very high economic damage.

The FRMPs focus on prevention, protection, and preparedness and are scheduled for completion in 2015. It will be essential that this Flood Directive is fully coordinated with the WFD, notably the FRMPs, the RBMPs, and the public participation procedures. All assessments, maps, and plans will need to be publically available.

[3] The WFD requires the identification of significant water management issues in each RBD at least two years before the beginning of the River Basin Management Plan. Significant water management issues are defined as environmental pressures that pose the greatest risk to water bodies in the River Basin District. These are the issues that could cause water bodies to fail to achieve the environmental objectives of the WFD by 2015.

## 5.2 Tisza River Basin

The Tisza River is the longest Danube tributary. It is the largest sub-basin – 157,186 km$^2$ – and is home to 14 million people across five CEE countries – Hungary, Romania, Serbia, Slovakia, and Ukraine (Table 2).

**Table 2. Countries sharing the Tisza Basin**

| Country | Basin area in country (km$^2$) | Status in the EU |
|---|---|---|
| Hungary | 46,213 | EU Member State |
| Romania | 72,620 | EU Member State |
| Serbia | 10,374 | Potential Candidate EU Member State |
| Slovakia | 15,247 | EU Member State |
| Ukraine | 12,732 | Non-EU Member State |

The Tisza countries have a long history of cooperation, including a 1998 agreement on the protection of the Tisza and its tributaries and the establishment, in 2000, of the Tisza Forum to address flood issues. The Tisza countries are all parties to the DRPC and to the Framework Convention on the Protection and Sustainable Development of the Carpathians (Carpathian Convention). At the first ministerial meeting of the ICPDR countries in 2004, ministers and high-level representatives of the Tisza countries signed a memorandum of understanding – *Towards a River Basin Management Plan for the Tisza River supporting sustainable development of the region*. The ICPDR established the Tisza Group as the platform for strengthening coordination and information exchange related to international, regional, and national activities in the Tisza Basin and to ensure that actions where harmonised and effective.

The Tisza countries have together developed the Integrated Tisza RBMP. This goes much further than the requirements of the WFD and accounts for water quantity as well as water quality. It identifies measures that will have positive impacts both on water quality and quantity and on aquatic ecosystems.

### 5.2.1 Comparing the Tisza and Danube RBMPs

The Tisza Group identified that the integration of water quality and quantity with land planning, is an essential issue to be considered during the preparation of the Integrated Tisza RBMP. The draft, developed in 2010, was submitted for public participation and the final plan was introduced to the ICPDR Tisza Countries Heads of Delegation in December 2010 (ICPDR, 2010a; ICPDR and UNDP/GEF, 2011). Four significant water quality issues were identified for the Tisza Basin which are similar to those in the Danube RBMP – pollution by organic substances, by nutrients, and by hazardous substances, and changes in hydromorphology. The Tisza plan also introduces a methodology developed for integrating floods and excess water, droughts and

water scarcity, and climate change. All three water quantity management issues were considered to have a direct impact on water quality in the Tisza Basin (ICPDR, 2007a).

In contrast to the Danube RBMP, the Tisza plan was produced with a higher resolution. It takes account of rivers with smaller catchments – larger than 1,000 km$^2$ (instead of 4,000 km$^2$) – and natural lakes – larger than 10 km$^2$ (instead of 100 km$^2$) – and of basin-wide importance.

### 5.2.2 Integrating water quality and quantity issues

Water resources are mainly used for public water supply, irrigation, and industrial purposes. Other uses include agriculture, fishing, and recreation. Water use for irrigation will increase significantly as all Tisza countries plan to upgrade existing irrigation systems and build new schemes. The increase in water use will add to the pressures on aquatic ecosystems, particularly in the summer when flows are low.

Water scarcity and droughts, and floods and excess water events, are major challenges and climate change is expected to further influence the current situation. To manage droughts, floods, and climate change, the first priority is to move towards water-efficient and water-saving economies and to improve water-demand management in line with planning future land use and spatial development.

The Tisza RBMP includes horizontal measures, such as international coordination and consultation; drought mitigation measures, such as changes in agricultural practices, improving irrigation efficiency, and reducing leakage rates; a more coordinated approach to water allocation and managing low-flows; and flood protection measures (Box 10).

**Box 10. 'Making space for water' in the Bodrog River Basin**

Under the UNDP/GEF, the Tisza demonstration project *Making Space for Water* was jointly implemented by Hungary, Slovakia, and Ukraine with the main objective being to mitigate the consequences of floods by achieving consistent and holistic management of flood risk in the Bodrog River Basin (tributary of River Tisza). Local stakeholders worked over two years to formulate the project. It included both top-down and bottom-up approaches to ensure that national policies were translated into practical solutions and local flood protection experiences were mainstreamed into the national policies. It successfully combined various policy, practical, and communication ingredients, such as flood management strategy, demonstration sites, rehabilitation measures, capacity and ownership building at a local scale, and a public information campaign.

Source: GWP ToolBox case study No. 398 (www.gwptoolbox.org).

## 5.3 Sava River Basin

The Sava River Basin is different to most other basins in Europe. The political changes in the region of the former Yugoslavia in the 1990s turned the Sava River from the largest national river into an international river, and substantially challenged water management practices in the basin (Komatina, 2011).

The Sava River Basin is one of the most significant sub-basins of the Danube covering 97,713 km$^2$, and is home to 8.5 million people. Today it flows through Slovenia, Croatia, Bosnia and Herzegovina, and Serbia and joins the Danube in Belgrade (Table 3). The former Yugoslav

national river became an international waterway as a result of the 1991–1995 conflicts. In 2002, following the end of hostilities, negotiations over several years produced the *Framework Agreement on the Sava River Basin*. In 2006 the International Sava River Basin Commission (ISRBC) was established to implement the Agreement.

**Table 3. Countries sharing the Sava River Basin**

| Country | Basin area in country ($km^2$) | Status in the EU |
|---|---|---|
| Bosnia and Herzegovina | 38,349 | Non-EU Member State |
| Croatia | 25,374 | EU Member State |
| Montenegro | 6,930 | Non-EU Member State |
| Serbia | 15,147 | Potential candidate EU Member State |
| Slovenia | 11,735 | EU Member State |

The Framework Agreement is a unique international agreement that integrates many aspects of water resources management. The specific feature of the ISRBC within the European basin organisations is the integration of environmental protection and navigation responsibilities within one institution. This provides the ISRBC with the broadest scope of responsibilities among river commissions. The ISRBC has the capacity for making decisions about navigation and making recommendations on all other water management issues. It provides the main mechanism for cooperation among the five riparian countries and serves as a platform for coordinating and implementing the WFD in the basin on issues of basin-wide importance.

Future development activities in hydropower, navigation, agriculture, and flood defence may have negative impacts on water status and so are also included in the RBMP. An integrated RBMP, FRMP, and emergency preparedness plan are expected to be fully completed by 2015 (ISRBC, 2013a, b).

## 5.4 Drin River Basin

The Drin River is a complex transboundary water system and a strategic developmental resource for the riparian states in south-eastern Europe. These include Albania, Greece, Montenegro, and the Former Yugoslav Republic of Macedonia. The Drin Basin covers some 19,582 $km^2$ and includes Lake Prespa, Lake Skadar/Shkoder, and the Buna/Bojana River sub-basins, which are all protected under the Ramsar Convention as wetlands of international importance. Hydropower plants installed on the Albanian Drin produce 85 percent of the country's hydropower, which is 70 percent of the country's energy needs. There are 44 dams in Albania for energy production and for irrigation.

In the Former Yugoslav Republic of Macedonia, two large dams were built on the Black Drin mainly for hydropower generation. Until recently, these were managed nationally with little consideration for other users in the basin. But the country lacks sound institutional structures, governance, capacity, and financial resources to effectively manage this infrastructure.

Since 2005 efforts to strengthen transboundary cooperation have been one of the key outcomes of the *Regional Dialogue on Transboundary Water Resources Management in South-*

*Eastern Europe* to promote sustainable management of these shared water bodies. The activities under the Regional Dialogue (assessments, international roundtables, capacity building workshops, and study tours) were used to enable stakeholders to identify solutions that can be applied in their respective basins. In 2009, participation of the Drin stakeholders in these events was a catalyst for the initiation of the Drin Dialogue. In 2011, the key political outcome of the Dialogue was the signing of a memorandum of understanding for the Management of the Extended Transboundary Drin Basin. Although this was signed by ministers from the riparian states who were responsible for the management of water and the environment, it was developed by the main water agencies rather than by initiating negotiations on an intergovernmental agreement (Scoulos et al., 2015). Both Dialogues were initiated under the Petersberg Phase II/Athens Declaration Process and were implemented in synergy with the GEF IWLEARN programme.

## 5.5 Dniester River Basin

Moldova and Ukraine are not EU Member States, but they intend to apply for membership. They share the Dniester River Basin. It is the fifth largest in the Black Sea region with the largest land area in Moldova, which includes a population of 2.7 million people. The Dniester River supplies water to towns located along the river, including Chisinau, the capital city of Moldova. The basin's ecosystems deteriorated during the Soviet era as agrochemicals and untreated wastewater were discharged into the river and water abstractions for a variety of purposes were not controlled. The mechanisms and tools available are not sufficient to effectively manage water nor can they cope with the need for transboundary cooperation to manage this shared resource. This is aggravated by the Transdniestrian conflict along the border between the two countries and which affects the use of the joint infrastructure for wastewater treatment. The problem takes on transboundary dimensions as polluted water flows into Moldova from Ukraine and then back into Ukraine again before discharging into the Black Sea south-west of the city of Odessa.

**Box 11. Cooperation of Ukraine and Moldova**

Ukraine and Moldova aspire to join the EU and so both governments have declared a willingness to adopt the WFD. However, the institutional capacity in the basin is inadequate for this purpose. There are also differences in legislation, procedures, monitoring strategies, information gathering, and institutional organisation between the two countries. Hence there is need to develop step-by-step guidelines in order to implement IWRM principles.

A legal framework for cooperation was agreed and signed in 1994 and a milestone in mutual cooperation was the signing of the Dniester Treaty in 2013. This enabled external funds to be mobilised and projects to be implemented with support from the EU Commission (Eastern Partnership, trilateral cooperation Romania–Ukraine–Moldova, Black Sea programme). A project, *Transboundary cooperation and sustainable management in the Dniester River Basin: Phase III – Implementation of the Action Programme (Dniester-III)*, started in 2009 with support from Sweden and Finland. It is implemented by the Organisation for Security and Co-operation in Europe, UNECE, and the United Nations Environment Programme (UNEP) in close collaboration with authorities and NGOs from Moldova and Ukraine. The aim is to improve cooperation between Moldova and Ukraine on joint management of the Dniester River Basin. Following the signing of the treaty, a high-level meeting in April 2015 provided an opportunity for bilateral cooperation through the launch of the Strategic Framework for Adaptation to Climate Change for the Dniester Basin.

Source: GWP ToolBox case study No. 425 (www.gwptoolbox.org).

In 1994, a bilateral agreement was signed between the governments of Moldova and Ukraine on the *Joint Use and Protection of the Cross-Border Waters*. This cooperation framework is based on the contributions of a network of local authorities, non-governmental organisations (NGOs), academia, and university communities and was designed to ensure effective cooperation to put IWRM principles into practice. Following the cooperative framework, the EU funded an initiative called 'Neighbourhood Policy' to promote Ukraine–Moldova cooperation (Box 11). But in spite of all the efforts by different levels of stakeholders to develop an integrated management plan for the Dniester Basin, little has been achieved in practice beyond producing a number of documents and plans to regulate different activities in the basin. The major weakness is the lack of institutional capacity to prepare, coordinate, and implement a comprehensive RBMP.

## 5.6 At macro-regional level

In 2009, the EU established an economic strategy for the Baltic Sea region and in 2011 a similar strategy was adopted for the Danube region. In 2014, the European Council invited the European Commission to develop an EU strategy for the Adriatic and Ionian region. The aim of these macro-regional strategies was to mobilise new projects and initiatives to create a sense of common responsibility. They are an important innovation for territorial cooperation and cohesion and the two existing strategies are now demonstrating their merit both strategically and politically. Although further improvements are needed for planning and implementing projects, there are clear results of improved and more integrated policy-making (EC, 2013a).

### 5.6.1 EU Strategy for the Danube Region

The EU Strategy for the Danube Region follows in the footsteps of the EU Strategy for the Baltic Sea Region and builds on its good practices. It is focused on the WFD and the Floods Directive as major issues within the region. The European Commission jointly developed the EU Strategy for the Danube Region (EUSDR) with the Danube Region countries and stakeholders in order to address common challenges together. The strategy addresses four main objectives, or 'pillars' – connecting the region, protecting the environment, building prosperity, and strengthening the Danube Region.

The strategy addresses 11 wide-ranging priority areas (Table 4). Each priority area is jointly coordinated by two participating countries that designate a Priority area Coordinator.

The main criterion for selecting projects and actions is basin-wide importance. This includes issues that require a basin-wide perspective and cooperation among the basin countries, and those that require inter-ministry or inter-sector coordinating mechanisms and policy integration. The funds will support projects that promote sustainable development and cover several regions and countries. GWP CEE is a permanent participant of the EU Strategy for the Danube Region Priority Areas 4 and 5 Steering Groups.

The parallels between EU Strategies for the Baltic Sea Region and Danube Region are shown in Table 5. GWP CEE was involved in a workshop to support knowledge transfer between the two programmes.

**Table 4. Priority areas for the EU Strategy for the Danube Region**

| Priority area | Coordinating countries |
|---|---|
| P1 Mobility and inter-modality | Inland waterways: Austria, Romania<br>Rail, road and air: Slovenia, Serbia |
| P2 More sustainable energy | Hungary, Czech Republic |
| P3 Culture and tourism, people to people | Bulgaria, Romania |
| P4 Water quality | Hungary, Slovakia |
| P5 Environmental risks | Hungary, Romania |
| P6 Biodiversity, landscapes, quality of air and soils | Germany (Bavaria), Croatia |
| P7 Knowledge society (research, education and ICT) | Slovakia, Serbia |
| P8 Competitiveness of enterprises | Germany (Baden-Württemberg), Croatia |
| P9 People and skills | Austria, Moldova |
| P10 Institutional capacity and cooperation | Austria (Vienna), Slovenia |
| P11 Security and organised crime | Germany, Bulgaria |

**Box 12. Danube strategy challenges**

In 2014, progress with the European Strategy for the Danube Region was assessed. A review by the Association of Employers in the Water Management Sector in Slovakia recommended the development of better governance and identified the main challenges facing the region:

- Lack of a mandate for the steering group members to adopt decisions
- Frequent changes of members
- Absence and passivity in the case of some priority areas
- Inconsistency between decision-making of the steering group meeting and consequent decisions about the projects 'at home'.

Source: Translated from Association of Employers in the Water Management Sector in Slovakia: Water – integrated approach in mutual cohesion, Special Issue – Water Management Journal, Volume 57 June 2014.

**Table 5. Parallels of between the Baltic Sea Region strategy and the Danube Region strategy**

| Aspects | Baltic Sea Region | Danube Region |
|---|---|---|
| Number of participating countries | 11 | 14 |
| Number of EU Member States | 8 | 9* |
| Catchment area ($km^2$) | 1,739,000 | 830,000 |
| Number of international river basin districts | 14 | 1 |
| Major legal tools | EU WFD<br>EU Marine Strategy Directive | EU WFD<br>EU Floods Directive |
| Type of water management | Integrated Marine Basin Management and Integrated River Basin Management | Integrated River Basin Management |
| Number of priority areas | 15 | 11 |

**Croatia joined the EU in 2014 after the launch of the EUSDR*

## 5.7 Rural development planning

EU Rural Development Policy supports investment in rural communities and is strongly influenced by the WFD and the EU CAP. Within these influences, Member States have flexibility to select the most appropriate measures to address the specific needs of their country and to decide spending priorities.

In 2003, GWP CEE initiated the idea of a Dialogue on Water for Food and Environment with the aim of providing policy advice for sustainable development that promoted an integrated approach across the rural sector. The Dialogue combined international, national, regional, and local public participation and was organised within the framework of the Global Water for Food and Environment (WFE) Dialogue for implementing the WFD in agricultural water management in CEE countries. The Dialogue was coordinated with other relevant activities of GWP CEE, the European Regional Working Group of the International Commission on Irrigation and Drainage (ERWG ICID), World Wide Fund (WWF), Danube-Carpathian Programme and WWF Europe.

The Dialogue resulted in 10 National Dialogue Reports and the CEE regional report (GWP CEE, 2003, 2004) The participating countries were Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia. The key messages included:

- The need for a delicate balance between meeting EU water and common agricultural policies to enable competitiveness without increasing the burden on the environment
- To raise the relatively low living standards typical in agriculture in all CEE countries, reconsideration of subsidiary policy is needed
- People living in disadvantaged areas need to achieve social justice and so environmentally friendly investments must be encouraged with adequate incentives.

Although farmers will be in the front line implementing many of the WFD measures, there is poor communication and coordination between the water and agricultural sectors. Most farmers do not know how to contribute to the water planning cycle.

The role of 'national cultures' requires more attention. Implementing the WFD in agricultural water management takes place in the highly diverse economic conditions, geographical circumstances, socio-cultural factors, government structures, and traditions of each EU Member State.

The principle of equity should be applied among environmental, social, and economic interests, so that adequate consideration is given to each and a broad consensus is reached on priorities.

Agricultural development needs to recognise the environmental standards set by the WFD. But equally the WFD must be harmonised with the different interests of achieving social and economic objectives.

Between 2007 and 2013 most public expenditure was for 'improving the competitiveness of the agriculture and forestry sectors' (Ecologic 2009a, b). Modernisation was crucial for rural economic development, but the actions taken during this period were not sufficient to solve water management problems. Thus additional efforts will be needed during the next Rural Development Regulation period from 2014 to 2020. This will provide financial support to implement the WFD and Natura 2000 objectives. It will also support investment in irrigation, but this will need to be conditional on farmers' compliance with standards set under the WFD and Natura 2000 regulations (EU, 2013). Irrigation development faces many challenges and will need to be coordinated alongside other water users to find sustainable solutions and so become part of an IWRM approach (Dirksen and Huppert, 2006). The WFD articulates the importance of coordination and this approach needs to continue across agricultural sector demands for more water for food production.

Unlike most of Western Europe, the CEE countries have significant rural populations, some 56 million people – 25 percent in the Czech Republic and over 50 percent in Slovenia. Investment in water infrastructure has largely targeted urban areas (settlements larger than 2,000 population) and this is driven by the EU Urban and Wastewater Treatment (UWWT) Directive. Less effort and funding has gone towards improving rural areas. But this is changing as appropriate water supplies and sanitation facilities are being installed in rural communities in several CEE countries (Box 13).

**Box 13. Sustainable sanitation for rural settlements**

The small Czech village of Hostetin has become a pioneer in sustainable development. In the past 20 years, the village has conducted several pilot projects, such as a constructed wetlands-based wastewater treatment plant, biomass district heating, a factory for producing organic cider, and a centre focused on education for sustainable development, which is also an example of ecological construction.

Constructed wetlands were tested in Slovenia and by 2007, a dozen were in operation. They blend well into the landscape and are highly appropriate in natural parks.

In Hungary, poplar plantations are irrigated by recycled waste water from small rural settlements without sewerage systems.

In rural schools in Ukraine, lack of proper water supply and sanitation facilities is a common problem. A local NGO, Mama 86, conducted several projects to install functional toilet solutions for schools and poor people. The concept of dry urine diverting toilets was chosen. The end products are composted and used as soil fertiliser.

Source: GWP ToolBox case study No. 467 (www.gwptoolbox.org) and GWP CEE, 2007.

## 5.8 Inland navigation

The River Danube is an important transport corridor within the EU's Trans-European Transport Network. Improving the River Danube's navigability is a key component of the EU's transport policy and a top priority issue in the EU Strategy for the Danube Region. Navigation plans and programmes need to consider alternatives that would have minimal impact on the water environment, such as other forms of transport.

In 1992 the Rhine-Main-Danube Canal was completed. This opened a navigable waterway connecting the North Sea, via the Rhine delta at Rotterdam, with the Danube delta in south-eastern Romania and the Black Sea, via the Rivers Rhine, Main, and Danube.

In 2007, the ICPDR, together with the Danube Commission and the International Sava River Basin Commission, initiated an international dialogue to create a basis for improving navigation while at the same time protecting and improving the Danube's natural landscape and water quality. This resulted in the *Joint Statement on Guiding Principles for the Development of Inland Navigation and Environmental Protection in the Danube River Basin* (ICPDR, 2007b). This document provided, for the first time, guiding principles and criteria for planning and implementing waterway projects that bring together the conflicting interests of navigation and the environment. The Joint Statement is internationally recognised as a milestone for developing inland navigation in the Danube Region and an example for other navigable basins across Europe. It assists in preventing conflicts, helps to create integrated solutions, and provides planning security for new infrastructure projects.

To facilitate and apply the Joint Statement, inland waterways planning authorities and interested stakeholders prepared a *Manual on Good Practices in Sustainable Waterway Planning* as a reference and practical tool for the Danube and other European river basins (ICPDR, 2010b). The manual offers general advice on implementing a balanced and integrated planning process. The river engineering criteria elaborated in the Joint Statement provide a general guide to the four essential features of integrated water transport (IWT) planning:

- Identify integrated project objectives incorporating IWT aims, environmental needs, and the objectives of other uses of the river reach, such as water management, recreation, and fisheries
- Integrate relevant stakeholders from the initial scoping phase of a project
- Carry out an integrated planning process to translate the IWT and environment objectives into concrete project measures creating, where possible, win-win results
- Conduct comprehensive environmental impact assessments before, during, and after the project works, enabling an adaptive planning and implementation approach as well as evaluating a project's progress.

In 2014, the EU Transport Council and Ministers of the Danube Riparian States endorsed the *Fairway Rehabilitation and Maintenance Master Plan for the Danube and its Navigable Tributaries*. The Master Plan was prepared within the framework of the EU Strategy for the Danube Region (Priority area 1a on Inland Waterways).

## 5.9 Hydropower development

In 2010, ICPDR, as part of the Danube Declaration (ICPDR, 2010a) and new EU legislation on renewable energy, was asked "…to organise in close cooperation with the hydropower sector and all relevant stakeholders a broad discussion process with the aim of developing guiding principles on integrating environmental aspects in the use of existing hydropower plants, including a possible increase of their efficiency, as well as in the planning and construction of new hydropower plants."

The EU Directive on Renewable Energy favours diversifying energy to include renewable energy production, such as hydropower. To ensure full coordination with other water interests, the Action Plan of the EU Danube Region Strategy (Priority area 2 – *To encourage more sustainable energy*) includes the action '*to develop and set up pre-planning mechanisms for the allocation of suitable areas for new hydro power projects*'.

ICPDR took a lead in elaborating the Guiding Principles on Sustainable Hydropower Development in the Danube Basin (ICPDR, 2013a, b). The hydropower sector, NGOs, and scientific community produced an Assessment Report on Hydropower Generation in the Danube Basin that provides key evidence on hydropower generation in relation to water management, flood protection, and environmental protection. A strategic planning approach was recommended for new hydropower stations based on assessments at the national/regional level followed by the project-specific assessment that guides decision-makers towards areas where hydropower can be produced with minimal environmental impact. This approach is in line with the prevention and precautionary principle and with the principle that the 'polluter pays'.

**Box 14. 'No-go' areas in Romania**

In Romania until 2020, small hydropower projects will be excluded from EU funding under the Operational Programme Large Infrastructure. This decision followed a nationwide action in 2013 that united associations of fishermen, researchers, academics, and ecotourism groups. The Romanian authorities promised to assign a 'no-go' status to areas protected from small hydropower development. Following the recommendations of the ICPDR Guiding Principles on Sustainable Hydropower Development in the Danube Basin, the authorities created a joint working group of government and civil society to develop criteria for integrating 'no-go' areas into legislation and improving construction and operating conditions for hydropower outside those designated areas.

Source: ICPDR, 2015d.

## 5.10 Promoting IWRM

The main proponent for IWRM in the region is GWP CEE. Information and experience on IWRM practices is available in the GWP ToolBox, which is now used to support water management curricula in universities and colleges and training as part of the EU accession process.

GWP CEE is a key player in mobilising public participation and stakeholder involvement in water management reform (Box 15). In 2001 GWP CEE acquired observer status with the ICPDR and has since been active in the expert working group on public participation. Most activities are conducted at the national level.

**Box 15. GWP joins the National Water Management Council of Hungary**

The National Water Management Council supervises river basin management planning at the national level, including endorsement of the RBMPs prepared according to the WFD. Council members include representatives of different ministries with water interests, delegates from the four sub-basin water management councils, water NGOs, water users, and professional-scientific associations – more than 30 members in total. The Council is chaired by the Secretary of State responsible for water nominated by the Minister of Interior.

Professor Emeritus Ferenc Ligetvári, GWP Hungary, was invited to join the Council. He is now the elected vice-chair of the Council, becoming the highest elected member. GWP Hungary is now able to substantially influence RBMP planning in Hungary – a process of strategic importance.

Source: Gayer, J., personal communication.

# 6 Adopting IWRM – where are we?

This paper reviews progress across the CEE region towards adopting IWRM and putting its principles into practice.

Such a review is made difficult because of the diverse range of physical, social, economic, and environmental conditions that prevail across the region. But there are common features, as each country has sought a pathway from a Soviet era command economy to a free-market economy with democratic institutions. Most countries have also joined, or are planning to join, the EU. Thus they are all rapidly absorbing and implementing the stringent legal requirements of EU Membership. In the water sector, the environment and water quality requirements of the WFD dominate water resources planning and management. Many see this as a surrogate for IWRM as the two have many common features, though IWRM has a much broader focus on sustainable social and economic development and not just on the environment. In view of this, the paper reviews progress in pursuing the WFD as an important step towards putting IWRM into practice.

Over the past decade progress has been made across the region towards improving water quality and meeting the WFD requirements, but many problems, which mostly stem from past practices, still persist. Untreated municipal and industrial wastewater discharge into water bodies is still a major problem and plans to improve this situation remain at the top of the water management agenda together with concerns about flooding and droughts that are occurring more frequently and with greater effect in some countries.

GWP CEE, as an organisation, has particularly focused its efforts at a macro level, encouraging a fully integrated approach to water management. And there are signs of good progress, driven by the WFD that, like IWRM, requires a river basin approach to water management and full stakeholder participation in decision-making. The most striking example is the Danube River Basin in which 19 countries now work together on river management for floods, droughts, and sedimentation issues, with those of ecosystems, agriculture, aquaculture, industry, navigation, and power generation. This river basin has a long history of transboundary cooperation and this has been built upon to provide strong professional and institutional capacity that can cope with the demands of growing nations. It is a model of good practice that is used by many other river

basins both within Europe and across the world. Other important examples of good practice stem from this experience in the Tisza and Sava River Basins which are tributaries of the Danube. The Drin Basin, too, is a complex transboundary water system with Ramsar-protected wetlands in which stakeholders are participating in planning through the Drin Dialogue, though some countries are not EU Member States and so are not obliged to meet the WFD requirements.

But equally there are many challenges, exemplified in this review by the Dniester River Basin which is shared by Moldova and Ukraine, neither of which are EU Member States. Both countries experience many national and transboundary problems, pollution, and suffer from a lack of capacity to effectively share this resource even though the paper agreements are in place.

At the macro level, cooperative approaches are visible in the EU development strategies for the Baltic Sea and the Danube Regions, where listed priority actions for economic and social development are to be integrated with those of water quality improvements. Cooperation is also promoted in rural development planning where large communities still rely on agriculture for their livelihoods. EU Rural Development Policy is strongly influenced by the WFD, such as solving nitrate leaching problems, and the EU's CAP. GWP CEE initiated a Dialogue on WFE to provide policy advice for sustainable development, which promotes an integrated approach across the rural sector.

Similar steps are being taken to integrate water resources planning with inland navigation, which now link the North Sea and the Black Sea, and hydropower development. Both are critically important to sustainable economic development across the CEE countries.

In conclusion, CEE countries have many strengths, not the least of these being a cohort of highly qualified water management professionals with high levels of education, and training to internationally accepted standards. Progress towards IWRM over the past decade has been significant, particularly at the macro level, bearing in mind the starting points for many countries in 1989. But much more needs to be done to coordinate planning at the national and local levels. This is the challenge for the next six-year phase of planning and implementing the WFD.

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GWP ToolBox: http://www.gwptoolbox.org

International Commission for the Protection of the Danube River: http://www.icpdr.org

International Sava River Basin Commission: http://www.savacommission.org

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