

Impact of Water Management on Water Saving in Some Pre-accession Countries

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Introduction

Last twelve years Estonia, Latvia, Lithuania, Poland, Czech Republic, Slovakia, Hungary, Slovenia, Romania and Bulgaria have seen enormous changes in social, political and economic circumstances. The long post war period of central planning has left a legacy of problems to be resolved in water management; but the changes of the past twelve years also open doorways of opportunity for repairing damage and sustainable use of water in the future. While the circumstances in the individual countries differ one from the other, this history binds them with a link which in turn is strengthened by the shared goal of all to rejoin Europe, now under the umbrella of the European Union [GWP/ CEETAC, 2000].

The water problems in these 10 countries have many dimensions – political, institutional, legal, and technological. There was institutional fragmentation and budget constraints limiting the scope and scale of investment in water. Now, the structural economic change offers a window of opportunity, affecting levels of water saving.

The paper presents the impact of water management on water saving in the Central and Eastern European (CEE) region, and specially in Bulgaria - country with the highest water losses (average 52.3 %) and lowest GDP (USD 1593 per capita). The forecasts made about the development of the country, including the water sector by the year 2025, reveal that Bulgaria faces an acute need of large investments for upgrading of water services and water quality in the one hand, and for amendment of the general concept about water management, on the other hand.

Since 1 July 1997, a currency board has been in operation in Bulgaria. A currency board represents an extreme example of a fixed exchange rate monetary policy regime (1 Bulgarian leva to 1 DM). The currency board has also been introduced as a stabilization device in Estonia, and Lithuania.

Status of Water Resources Management in CEE

The CEE region covered by this paper contains 105 million population. The land of 1.08 million km² is mostly located in the Baltic Sea and Black Sea Basins.

Parts of the Czech Republic drains to the Nordic Sea and the percentage of the Bulgarian territory, draining to the Danube River, Black Sea and Mediterranean Sea is 36.1, 20.1 and 43.8 percent respectively (Fig. 1) [GWP/ CEETAC, 2000].

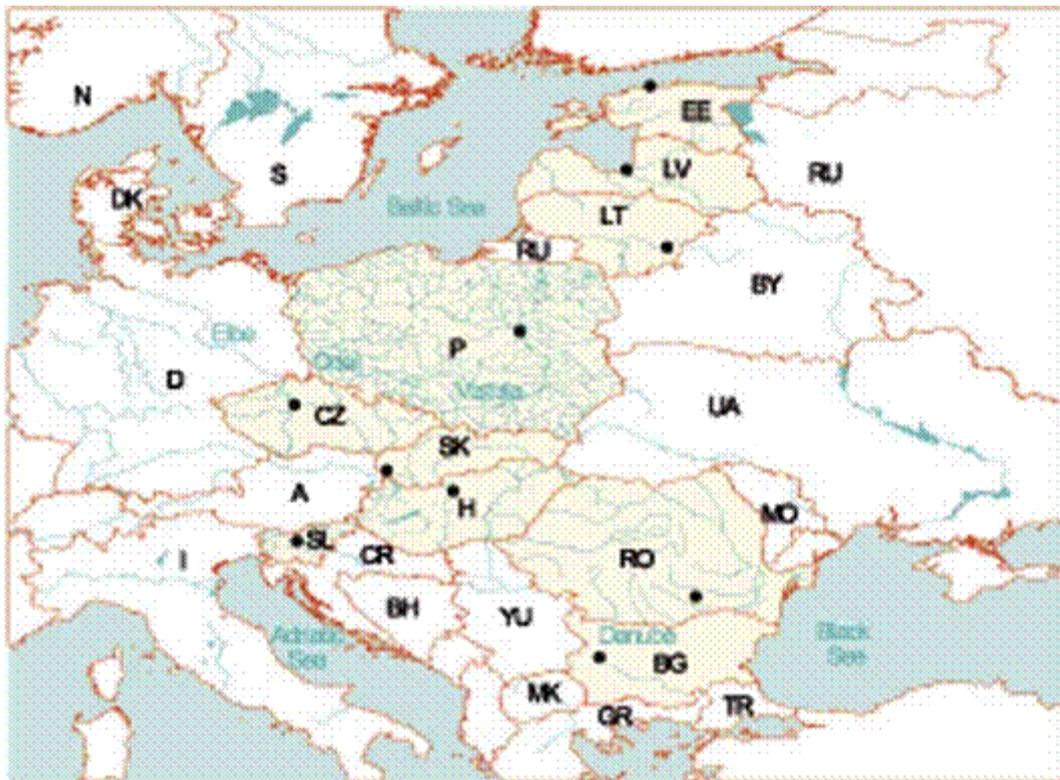


Fig.1. Map of the CEE region

Water availability varies across the CEE region (Table 1) [GWP/ CEETAC, 2000].

Table 1. Mean annual renewable water resources and GDP

Country	Internal	Internal	Rivers	Total	Total per	GDP
		per	flow	rivers	capita	
		capita	from	flow		
			other			
			countries			
	km ³	m ³	km ³	km ³	m ³	USD
Bulgaria	20,00	2410	5,00	25,00	3010	1593
Czech Republic	16,20	600	0,54	16,70	1650	5418
Estonia	11,70	8050	4,68	16,38	11290	3728
Hungary	6,00	570	109,00	115,05	10930	5016
Latvia	14,60	5840	19,40	34,00	11940	2573
Lithuania	15,40	4162	10,80	26,20	7043	2799
Poland	53,60	1440	5,00	58,60	1580	3811
Romania	34,00	1501	85,00	119,00	5253	1753
Slovak Republic	14,20	284	62,30	76,50	1530	3837
Slovenia	32,20	16100	13,20	45,40	22700	9673

In the dry years, water availability may be even in the order to 1000 m³/capita (Poland, Czech Republic and Hungary-on the basis of internal resources), which is usually considered a limit below which “scarcity” begins. Also, the persistent water shortages in other countries (Bulgaria and Lithuania) cause resource allocation problems, conflicts and competition between different water uses. Estonia, Latvia and Slovenia have relatively abundant water resources and most of their problems lie on the ‘demand side’ (e.g. quality

of drinking water, obsolete water infrastructure, and inefficient small water utility companies).

Also, annual water uses shows considerable difference in their structure (Table 2) [GWP/CEETAC, 2000]. Overall a pronounced reduction of water demand has been observed across the region in all water use sectors, mostly as a consequence of the fall in economic activity, of the highest control of the water quantity uses (water meters), and of the real water pricing.

The recovery of the economy might lead to small increase in demand, but in the future - excluding the impact of potential climate change - it is generally not anticipated to have serious quantity problems on the national level.

Table 2. Mean annual water use

Country	Year	Total km ³	Sectoral use, %				Annual water use per capita, m ³	Water use as a per cent of renewable resources
			Municipalities	Industry excluding power production	Power production	Agriculture		
Bulgaria	1997	12,9	11,0	11,0	76,0	2,0	1554	51,6%
Czech Republic	1998	2,2	39,4	35,0	24,8	1,5	225	34,6%
Estonia	1998	1,4	4,3	4,4	84	7,3	1000	8,9%
Hungary	1998	5,7	9,2	8,3	71,8	10,7	559	5,1%
Latvia	1997	0,4	38,0	35,0	7,0	2,0	91	0,8%
Lithuania	1998	5,1	2,8	1,2	94,0	2,0	1179	16,7%
Poland	1998	11,1	17,2	10,0	63,7	9,0	351	22,2%
Romania	1996	10,5	20,0	26,0	10,0	44,0	461	8,8%
Slovak Republic	1998	1,4	32,0	43,1	18,6	5,8	1141	74,6%
Slovenia	1998	0,5	50,0	50,0		less 1	170	0,7%

Discussion of water demand and use in individual countries would not be complete without analysing network losses. These losses are related both to industrial and household water uses. The level of losses provides a good indication what is the actual condition of water supply networks.

In a situation of low costs of water abstraction and purification, elimination of leakages in short term may be more costly than increase of the amount of water entered into the network.

Calculation of losses as the difference between the amount of water extracted and the amount of water sold is not fully appropriate (Table 3) [EUB4/3040/99/ 130877/ MAR/B2, 2000].

Table 3. Approximate network losses in the CEE countries

Country	Average	Maximum	Other estimates, comments
Bulgaria	52% (1)	70% in big towns	30% -90% (1) in villages
Czech Republic	na		
Estonia	na	60%	
Hungary	21%		
Latvia	13%	25%	24%
Lithuania	24%		28%
Poland	29%		
Romania	22%	39%	Bucharest
Slovak Republic	22%		
Slovenia	40%		

Note: na - data does not exist; (1) – new investigation.

In this way use of water for the so-called own purposes (e.g. washing the pipes and the filters) as well as the stolen water parts and exchange of water with other producers (users) are ignored.

The household water use varies from 112 l/cap/d in Bulgaria to 345 l/cap/d in Romania.

Low usage of water in Bulgaria results from the higher price of water than before (no state subsidies) and from obligatory installation of water meters. Now, all existing water supply and sewerage systems are 2-3 times oversized i.e. there are sufficient capabilities for water supply but water demand is low.

The recent investigations on water demands show that water losses in the Bulgarian supply systems are still significant. For example, they are from 27% to 84% in the Rakovsky water supply system (Fig. 2).

98.2% of population and 87.4% of populated areas are water supplied in Bulgaria. Large parts of water supply systems are constructed from asbestos-cement pipes that are more than 25 to 30 years old. The main pipes are of various materials, such as steel (19.5%), asbestos cement (77.5%), cast iron (1.5%) and concrete (1.5%). The water supply system having 22000 km of water mains needs upgrading.

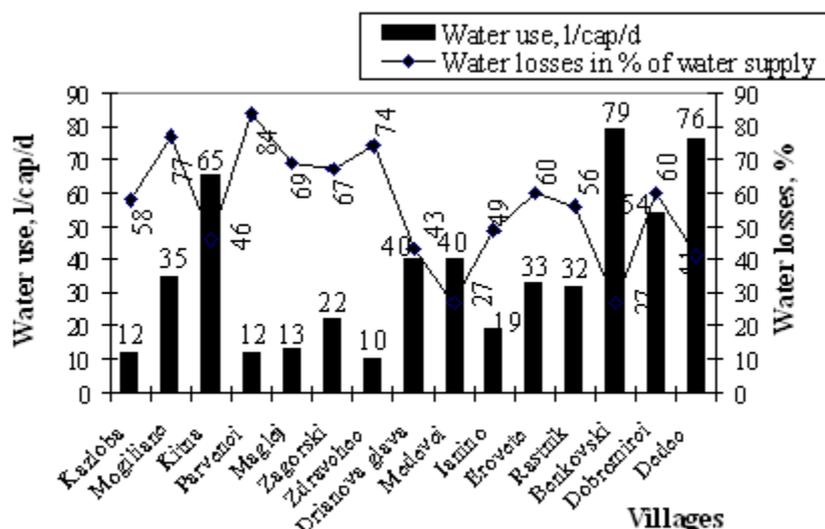


Fig. 2. Water use and water losses in Water Supply System Rakovsky, 1998.

Measures on Water Saving

In all transition economies, a combination of further market reforms and sound water policies can improve water saving.

First, changes in water quantity control will promote more efficient use of water. All the analysed countries have a very similar structure of the tariffs used. If there are no water meters measuring of the individual water consumption, a flat rate (per person-constant, per person and equipment standard, per m² of the apartment) is applied.

Information on the actual metering penetration of households was searched for, however, often no data were available [EU B4/3040/99/130877/MAR/B2, 2000].

Table 4. Household water metering penetration

Country	%	Comments
Bulgaria	n.a.	100% in 2002
Czech Republic	62%	Estimate
Estonia	More than 50%	Estimate
Hungary	97%	(1)
Latvia	58%	Estimate
Lithuania	84%	Water Suppliers Association
Poland	97%	(1)
Romania	87%	
Slovak Republic	80-90%	Estimate
Slovenia	100%	Estimate (1)

(1) The actual rate is lower because this value includes inhabitants living in multi-apartment houses connected to single water meter.

Box 1. In case of a deficit of drinking water resulting from limited possibilities of water abstraction, limitation of unit consumption by installation of water meters constitutes an alternative to water transfer or to its costly purification. Comparison of the costs of installation of water meters to the costs of water transfers for a distance of 40 km for agglomerations of 700 thousands of Cracow inhabitants in the 1980s, indicates that water meters are more cost-effective, even in case of some installation problems [EU B4/3040/99/130877/MAR/B2, 2000].

Second, increase of significance of the price mechanisms. The level of advancement of this process is very diverse. Slovakia, with a uniform and regulated water price for the entire country, represents an exception. In other countries an increase of unit prices of water services has been observed (i.e. the increase was higher than inflation). Three countries with the lowest unit prices (Slovakia, Bulgaria, Lithuania) are characterised with lower unit water use than the countries with the highest service prices (Estonia, Hungary) (Fig. 3) [EU B4/3040/99/130877/MAR/B2, 2000].

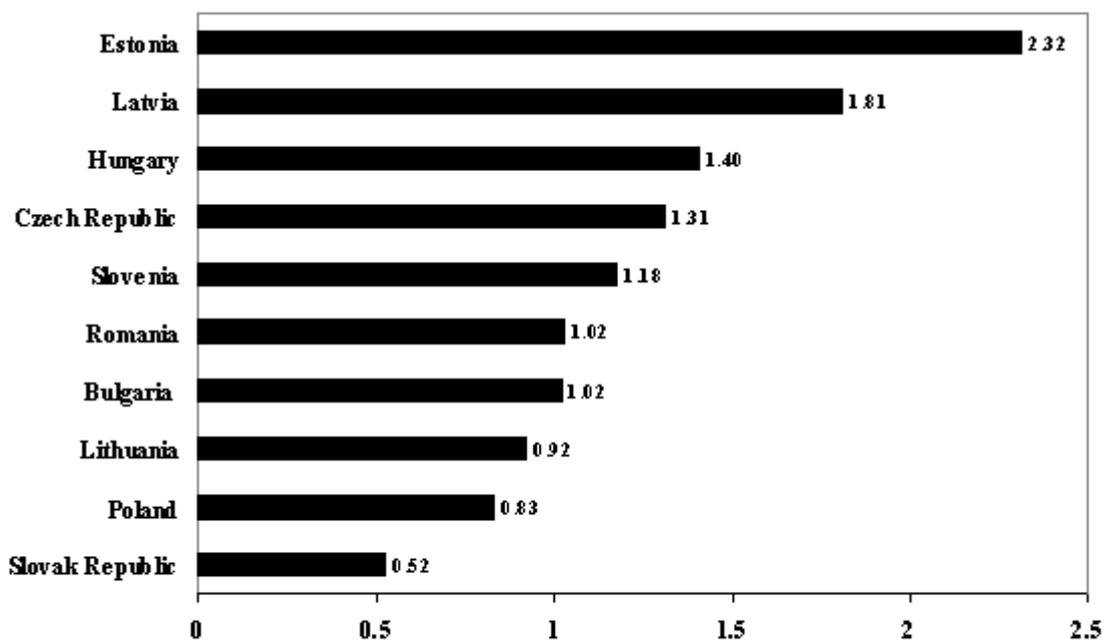


Fig.3. Price for water and wastewater, USD (PPP)/m³

Generally, the water usage in urban centres is decreasing due to price increase, change of tariffs, or other, effective incentives.

The number of households that are highly sensitive to price changes arise. The highest percentage of income spent on water and sewerage services is observed in Romania – 4.5% (Fig. 4).

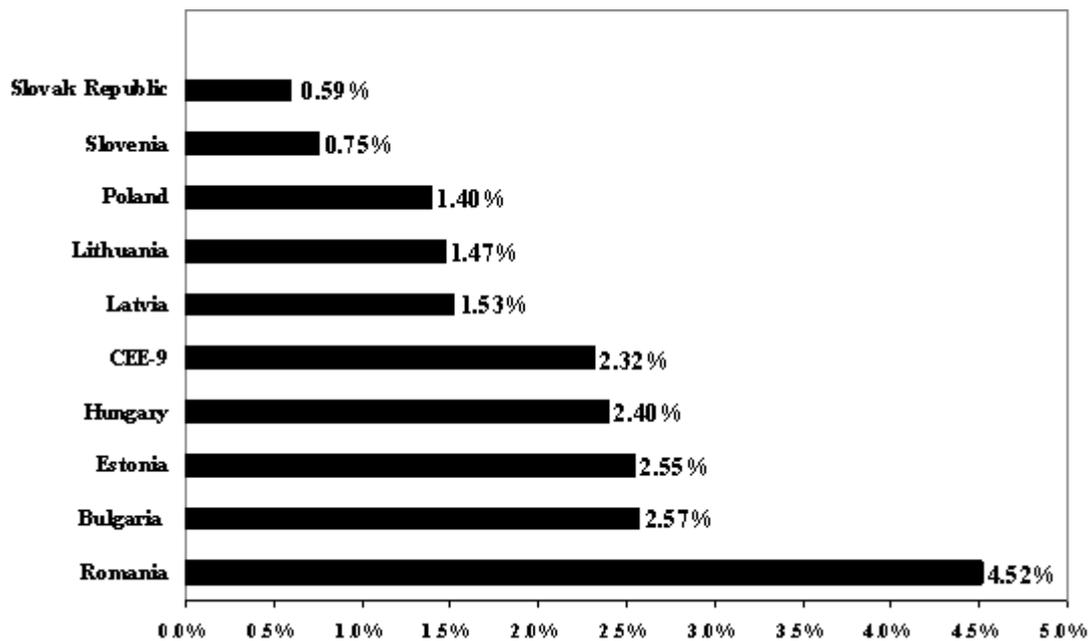


Fig. 4. Share of expenditures for water and sewage treatment in households budgets, %.

Third, privatization and reduced state interference in economic decisions will encourage management to improve the operating performance of water users, while replacing old equipment by less water-intensive and cleaner production technologies. Well-prepared water laws and investments can contribute to this process.

A clear institutional separation of enterprise ownership from regulatory authorities should help ensure realistic water quantity measures and water saving.

There is a clear need for innovative financing approaches for financing specific actions. First of all, it is proposed to undertake immediate analysis into scale of financial demands, the resource gap, and the investments offering the water saving.

The most popular form is a municipal ownership of water and sewerage infrastructure. A general trend is that state ownership is gradually being replaced by municipal ownership (very often mixed forms occur), and that privatisation attempts are carried out in the whole region.

Involvement of foreign capital is not popular (Hungary, Estonia, Poland, the Czech Republic) and in all countries listed only a few foreign operators exist. The main reason seems to be high political impact of the growth of price for water and wastewater services. The foreign capital is willing to get involved in financing of water and wastewater infrastructure only when the return on capital invested is adequate. The municipalities are not willing to accept high increase of prices for water and wastewater services - these decisions are not popular.

EU integration process that has been launched face a large challenge related to the necessity of improving the water and sewerage infrastructure.

Fourth, international co-operation can bring in best water saving management practices from around the world. Sharing bad and good experiences between stakeholders with regards to water saving policies in place and the role of key factors explaining their

success or failure. For achieving of this shift in perspective is a need to improve communication between main actors in water resources management and to improve dialogue among politicians, water consumers, water specialists and other stakeholders. Communication at every level - regional, national, community and household - enables every body to find the right balance between competing initiatives that must be satisfied with efficiency, equity and sustainability criteria taken into account. For example, ToolBox for Global Water Partnership Case Study. The aim is to extract the lessons learned from a specific geographical area with implementation of integrated water resources management (IWRM) and pass on to others. Case studies can describe and discuss success stories as well as unsuccessful outcomes.

Conclusions

Entering the European Union is one of the most important goals for CEE countries. The main water saving drivers for action can be summarised as follows as:

- Complying with EU directives, Water Framework Directive and report of World Commission on Dams;
- Implementation of river basin management;
- Changing the ownership of water and sewerage infrastructure from the state ownership into mixed state-municipal or municipal;
- Improving financial flows for water saving. Attempts to privatise the sector, allowing involvement of foreign capital;
- Implementation of uniform rules of costs calculation borne by the operators. Better pricing policies in a very practical way by improving the transparency and the information available for consumers, users and taxpayers. Increase of the tariffs for water and sewerage exceeding inflation in order to decrease cross-subsidies;
- Generating knowledge for water saving practice and increasing public water saving awareness.

References

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