

### **3 Small community water services in Central and Eastern European Countries – situation, challenges, needs and developments**

*Marek Roman*

### 3 Small community water services in Central and Eastern European Countries – situation, challenges, needs and developments

#### 3.1 General information

Ten countries are usually referred to as Central and Eastern European (CEE) countries: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. They are linked by their geographical location, but also primarily by their political history after the Second World War, their current social and economical changes in the same direction and their willingness to become part of the European Union. In the years 1989-90, the CEE Countries regained their sovereignty and in the course of rebuilding a democratic political system began to change their economies to free market economies. At the same time, local governments were reinstated, and these began to take into their jurisdiction more and more matters of importance for local communities.

Regardless of common political, social and economic developments, the CEE countries differ from each other in many aspects. Differences exist in their demographic characteristics, the size of their water resources and the amount of water consumption. These characteristics are summarised in Tables 3.1, 3.2 and 3.3.

Table 3.1 Surface area, population and gross domestic product (GDP) of CEE countries

Country	Surface area km <sup>2</sup>	Population		Population density per km <sup>2</sup> (1998)	GDP in US \$ per capita per year
		Total million (1998)	% in rural areas		
Bulgaria	110,912	8257	31	74	1513 <sup>1)</sup>
Czech Republic	78,864	10295	32	131	4818 <sup>2)</sup>
Estonia	45,200	1429	30	32	3360 <sup>3)</sup>
Hungary	93,032	10,114	31	109	4569 <sup>3)</sup>
Latvia	64,600	2449	30	38	2430 <sup>3)</sup>
Lithuania	65,200	3702	35	57	2874 <sup>1)</sup>
Poland	312,685	38,666	38	124	4078 <sup>2)</sup>
Romania	238,391	22,503	40	94	1515 <sup>1)</sup>
Slovakia	49,012	5388	33	110	3654 <sup>1)</sup>
Slovenia	20,253	1983	50	98	10,076 <sup>1)</sup>

Source: Central Statistics Office, Warsaw, 2001

1) According to the official exchange rate in 1999 (CEETAC, 2000)

2) in the year 2000

3) in the year 1997 (CEETAC, 2000)

Table 3.2 Mean annual water resources of the CEE countries

Country	Annual renewable water resources m <sup>3</sup> per capita per year		
	Internal	River flow from other countries	Total
Bulgaria	2410	600	3010
Czech Republic <sup>1)</sup>	600	50	650
Estonia	8050	3240	11,290
Hungary	570	10,360	10,930
Latvia	567	11,373	11,940
Lithuania	4140	2903	7043
Poland	1440	140	1580
Romania	1501	3752	5253
Slovakia	284	1246	1530
Slovenia	16,100	6600	22,700

Source: CEETAC, 2000

- 1) According to another source, the volume of water resources of the Czech Republic is higher: internal resources – 1457 m<sup>3</sup>/capita.year, river flow from other countries – 97 m<sup>3</sup>/capita.year, total – 1554 m<sup>3</sup>/capita.year (Central Statistical Office, Warsaw, 2001)

Table 3.3 Mean annual water use in CEE Countries

Country	Year of data	Total water used in m <sup>3</sup> per capita per year	
		Total	in towns <sup>2)</sup>
Bulgaria	1997	1554	171.0
Czech Republic	1998	225	61.2
Estonia	1998	1000	43.0
Hungary	1995	657	85.4
Latvia	1997	91 <sup>3)</sup>	34.4 <sup>3)</sup>
Lithuania	1998	1179	33.0
Poland <sup>1)</sup>	2000	286	60.8
Romania	1996	461	92.2
Slovakia	1997	1058	380.8
Slovenia	1996	170	129.2

Source: CEETAC, 2000

- 1) According to data from the Statistical Yearbook (CEETAC, 2000)  
 2) Own calculation based on data given in table 2 (CEETAC, 2000)  
 3) Estimated for the largest cities.

The fraction of the population deemed to be rural is similar in eight of the ten CEE countries and lies within the range of 30-38%. In two countries, however, it is higher – in Romania it is 40% and in Slovenia 50% (table 3.1). The countries with the lowest water availability per inhabitant include the Czech Republic, Poland and Slovakia (table 3.2). However, when only the internal water resources are taken into account, i.e. the resources available within the territory of the given country, Hungary and Latvia also have a limited amount of water. It has to be noted that in these countries the amount of river water that flows in from other countries forms a large share of the total amount of water resources available. To a lesser extent this is also the case for Romania and Slovakia.

The water usage per inhabitant in CEE countries varies greatly (table 3.3). The index of total water usage in m<sup>3</sup>/person/year is high in Bulgaria, Estonia, Lithuania and Slovakia. This is a result of relatively high water consumption for energy and industrial needs. The index of water use in towns in seven CEE countries lies in the range of 33-90 m<sup>3</sup>/person.year. In three countries it is considerably higher:  
in Bulgaria – 171 m<sup>3</sup>/person.year; in Slovakia – 380.8 m<sup>3</sup>/person.year;  
and in Slovenia – 129.2 m<sup>3</sup>/person.year.

### **3.2 Condition of water services in CEE countries**

The availability of water and wastewater services can generally be characterised by the percentage of the population served. In the CEE countries such data are only available for the urban population, or refer to the population in general without an urban-rural breakdown. Data are rarely available for populations of small towns and rural areas. Table 3.4 summarises the data for inhabitants using municipal or community water supply and sewage disposal systems and sewage treatment plants. The data for the rural areas show that populations of small municipalities are in a worse situation than town populations as far as access to water supply and sewage disposal services is concerned. This is presented in more detail by the data for Poland shown in table 3.5. Statistical data quoted in tables 3.4 and 3.5 also clearly indicate that in small municipalities and in rural areas sewage disposal systems are significantly less developed than water supply networks.

**Table 3.4** Population using water supply networks and sewerage systems in CEE countries (major parameters – according to data 1997/98)

	% of population using:								
	Municipal water supply system			Municipal sewerage system			Wastewater treatment plants		
	Country wide	Urban	Rural	Country wide	Urban	Rural	Country wide	Urban	Rural
Bulgaria	85	n	n	49	70	2	36	n	n
Czech Republic <sup>1)</sup>	87.1	n	n	74.8	n	n	63.9	n	n
Estonia	77	n	n	60	80	45	50	n	n
Hungary	94	96	88	43	63	8	30	n	n
Latvia	93	n	<50	92	n	<50	88	n	n
Lithuania	70	n	n	60	n	n	36	n	n
Poland <sup>2)</sup>	84.9	91.7	76.5	55.7	83	11.5	53	79.3	10.7
Romania	55	n	n	40	n	n	28	n	n
Slovakia	81	n	n	54	84	16	36	n	n
Slovenia	66	n	n	n	74	n	43	n	n

Source: CEETAC, 2000; Central Statistical Office, Warsaw, 2000 and 2002; Foundation for the Development of Polish Agriculture, 2001; Hugh, J. and Roman, M., 2000; Roman, M., Kloss-Trębaczkiewicz, H. and Osuch-Pajdzińska, E., 2001

- 1) According to data from 2000 (Foundation for the Development of Polish Agriculture, 2001)
- 2) According to data from 2000 (Central Statistical Office, Warsaw, 2001, 2002; Hughes, J. and Roman, M., 2000; Roman, M., Kloss-Trębaczkiewicz, H., and Osuch-Pajdzińska, E., 2001)
- n No information available.

**Table 3.5** Population of Polish urban and rural areas using municipal water supply and sewerage systems and municipal wastewater treatment plants (data from 2000)

Type and size of settlements	% of total population of size group using:		
	Municipal water supply system	Municipal sewerage system	Wastewater treatment plants
<b>Urban area</b>			
Town size group (number of inhabitants)			
200 000 and more	96.8	92.0	75.5
100 000 ÷ 199 999	95.5	89.9	90.3
50 000 ÷ 99 999	92.6	85.4	82.8
20 000 ÷ 49 999	90.0	80.4	84.6

&gt;

Type and size of settlements	% of total population of size group using:		
	Municipal water supply system	Municipal sewerage system	Wastewater treatment plants
10 000 ÷ 19 999	84.3	72.0	76.8
5 000 ÷ 9 999	80.4	60.6	69.3
below 5 000	72.9	44.3	60.1
Town in total	91.7	83.0	79.3
<b>Rural area</b>			
Villages <sup>1)</sup>	76.5	11.5	10.7
Country in total <sup>2)</sup>	84.9	55.4	53.0

Source: Central Statistical Office, 2001

- 1) According to other sources (Central Statistical Office, Warsaw, 2001; Hughes, J. and Roman, M., 2000; Roman, M., Kloss-Trębaczewicz, H., and Osuch-Pajdzińska, E., 2001)
- 2) Own estimation.

After the Second World War, in the years 1945-1990, the communal water supply and sewage disposal systems in CEE countries were state owned. Institutional arrangements for managing the services also had a state-owned character. The services were either provided by state-owned companies or by central budget institutions that depended on the state administration. In general, water supply and sewage disposal in towns and rural areas were managed centrally.

After 1990 water supply and sewage disposal systems became the property of municipalities and communities. As well as gaining ownership of the technical systems, they became responsible for water supply and sewage disposal in towns and rural areas. While implementing these tasks they began to change the institutional arrangements for supplying water and disposing of sewage and wastewater in their territories. Currently there are different institutional forms such as: budgetary enterprises; limited liability companies; joint stock companies; water law companies; entrusting the operational services to private companies based on legal agreements; and others. Table 3.6 shows examples of the different institutional arrangements for water services currently in operation in Poland. The figures indicate that commercial code companies prevail in the larger cities (with populations over 50,000), while municipal budgetary enterprises and units operate predominantly in small urban municipalities (<10,000 people) and rural locations.

**Table 3.6** Incorporation forms of water/wastewater service providers in Poland as at December 1999

Locality by size of population	% of all providers in a particular type of locality					
	Budgetary enterprises and units	Limited liability company	Joint stock company	Unchanged incorporation <sup>1)</sup>	Other	Total
<b>Urban</b>	45.6	40.2	2.0	2.3	9.9	100.0
Over 50 000	8.0	71.5	8.0	9.1	3.4	100.0
20 000 – 50 000	22.6	68.4	2.3	3.8	4.9	100.0
10 000 – 20 000	38.4	51.2	1.8	1.8	6.8	100.0
5 000 – 10 000	52.0	33.0	1.7	1.1	12.2	100.0
under 5 000	71.2	12.0	0.0	0.4	16.4	100.0
Rural localities - total	57.8	9.9	1.1	0.9	30.3 <sup>2)</sup>	100.0

Source: own studies

- 1) Municipal enterprises – former state-owned enterprises operating under the State Enterprises Law of 1981.
- 2) The majority of them have entrusted operational services to others on the basis of a legal agreement or the lease of technical objects to conduct the services.

A characteristic feature of the current situation in water supply and sewage disposal services in CEE countries is the maintenance of public ownership of communal water supply and sewage disposal networks. The communities do not want to sell these assets and participation of the private sector in that field is very limited. Currently the main opening for private sector enterprise is found in the management of the operations, while the ownership of the system remains within the hands of the communities (or: remains communal property).

### 3.3 Challenges, needs and developments

The overall vision given by the Central and Eastern Europe Technical Advisory Committee (CEETAC) of the Global Water Partnership is that “in two to three decades there will be sufficient, safe, clean and healthy water and people living in stable societies in the CEE region” (CEETAC 2000). It is an ambitious vision, and to implement it requires complex activities within the scope of overall water resources management: protection from contamination; improvement of water supply and sanitation; improvement of protection against floods and droughts; promotion of international

cooperation in solving common aspects of water supply and sharing water resources; development and implementation of environmental protection policies; and obtaining sufficient funding.

In the field of water supply there is a need to develop the water supply networks, especially in small municipalities and rural areas. It is necessary to raise the access to domestic water supply services in those areas to the much higher levels of large towns. This is not only important from a perspective of social equity, but also to ensure an adequate level of public health. Currently, shallow wells, which are present in nearly all rural households, are the alternative water source, but the sanitary quality of their water is often unsure.

Extending the scope of water supply networks has to go hand-in-hand with improvements in the quality of water supplied to consumers. That requires further modernisation of existing water treatment plants and construction of new ones, to meet raised standards. Water supplies in small municipalities and rural areas in CEE countries mainly use water from groundwater sources. The quality of this water needs to be improved and its sources protected against pollution.

Development of improved water supply systems must be accompanied by an adequate development of sewage disposal and water treatment systems. If this does not happen, the paradoxical situation will emerge that the development of safer water supply systems in rural areas and small municipalities creates new threats to the environment and public health. Lack of funding is the biggest obstacle to improving water supply, sewage disposal and water treatment systems in CEE countries. The countries have low per capita GDPs and huge restructuring needs in many other fields as well as water services.

An important task currently being undertaken by the CEE countries is to ensure that in future the water tariffs make it possible to recover the costs of the water services, as laid down in Article 9 of the European Community water policy directive 2000/60/EC. This is an immensely difficult challenge. It will have to be implemented gradually over several years, because it will cause a significant increase in water prices for rural populations with very limited financial capabilities.

In meeting the considerable challenges they face, CEE countries do have some advantages over developing countries in the South facing similar problems. There is, for example, no shortage of qualified professionals able to design, build and maintain water supply infrastructure. The CEE countries all have university graduates with master's degrees and higher engineering degrees in water supply and wastewater engineering. Training facilities are also available for technical personnel and operators. There is an open market now for foreign technologies, particularly from Western Europe, and CEE home companies also produce appropriate modern solutions.

### 3.4 Relevance of this publication to CEE countries

Clearly many of the approaches described in this book are of great relevance in solving the problems of water supply services for small communities in the CEE region. It is true that, for CEE countries, the approaches and technologies are traditionally similar to the solutions used in Western Europe so that the range of technologies has to be expanded at the upper end. Knowledge for doing so exists already, as the experience of Western Europe countries is well known in CEE countries, and German and English textbooks for water supply engineering are widely available. The countries also publish their own high-standard textbooks. In Poland, for example, a new edition of a very detailed textbook (474 pages) devoted to water supply and sewage disposal in the rural areas was published in 1998.

Groundwater is the main source of water supply in small communities in CEE countries, so the information that is especially important is that on the removal of iron, manganese, ammonia and other pollutants found in underground waters. In CEE countries pressure filters are often used, with prior aeration carried out also in pressure aerators. Where possible, water supply networks in small communities are based on closed systems in which the water is obtained from boreholes and supplied by pressurised networks with equipment for the removal of iron in the distribution network or air vessels. Mostly, water tower reservoirs and air vessels are employed. The air vessels control the pumps and maintain the pressure in the water supply network in a given range.

The information on drinking water quality standards given is valuable and useful for CEE countries. In those countries, drinking water quality regulations are based on WHO guidelines. As all the countries intend to join the European Community, new regulations on drinking water are being implemented in line with the new European Union directive on drinking water (Council Directive 98/83/EC).

The data on water consumption in chapter 4.2 give examples of water consumption in various countries of Southern Asia and Australia. For comparison purposes, table 3.7 presents German data, which are very similar for water consumption to those in Central European countries.

**Table 3.7** Average water consumption in households using network water in Germany  
(Year 2000 data)

Purpose	Water consumption litres per capita per day
Drinking and food preparation	5.0
Bathing and personal washing	46.0
Toilet	35.0
Dish washing	8.0
Laundry	16.0
Other	8.0
Total	118.0

*Source: Globus, statistische Angaben: Bundesverband der Deutschen Gas und Wasserwirtschaft (KA – Wasserwirtschaft, Abwasser, Abfall 2002 (49) No. 2 p.152).*

Currently in CEE countries, households are reducing their per capita tap water consumption. This can be illustrated by the data from Poland presented in table 3.8. The decrease in water consumption by the households is due to water metering, the introduction of prices based on the actual costs of the services, the availability of better quality technology for house water installations and a reduction in water wastage.

**Table 3.8** Changes in average water consumption in households in Polish towns during the period 1995-2000

Year	Water consumption litres per capita per day
1995	168.9
1996	157.5
1997	149.5
1998	141.6
1999	136.2
2000	129.8

*Source: Central Statistical Office, Warsaw.*

Generally speaking, the decrease in water consumption should be seen as beneficial. However, the unit water consumption (in lcd) should not be excessively reduced, as this would be in contradiction with maintaining an adequate quality of life, the full realisation of people's needs for good hygiene and a basic condition for good public health.

## Bibliography

**Central and Eastern Europe Regional Technical Advisory Committee (CEETAC)** of The Global Water Partnership (2000). *Water for the 21st century: vision to action, Central and Eastern Europe*. Stockholm, Sweden, Global Water Partnership.

**Central Statistical Office (2001)**. *Environment 2001*. Warsaw, Poland, Central Statistical Office.

**Central Statistical Office (2001)**. *International statistics yearbook 2000*. Warsaw, Poland, Central Statistical Office.

**Central Statistical Office (2001)**. *Municipal infrastructure in 2000*. Warsaw, Poland, Central Statistical Office.

**Central Statistical Office (2002)**. *Statistical yearbook of the Republic of Poland 2001*. Warsaw, Poland, Central Statistical Office.

**Foundation for the Development of Polish Agriculture (2001)**. *Rural Poland 2000*. Warsaw, Poland, Foundation for the Development of Polish Agriculture. Rural Development Report.

**Hughes, J. and Roman, M. (2000)**. 'Water and wastewater sector pricing and economic regulation in Poland.' In: *Specialised conference "water management for 21st century: learning from the 20th century experience, 24-25 October 2000 Berlin, Germany*. London, UK, International Water Association (IWA).

**Roman, M.; Kloss-Trębaczewicz, H. and Osuch-Pajdzińska, E. (2001)** 'Legal and organizational forms of water supply and sewage disposal services in Poland' In: *Sixth BNAWQ Scientific and Practical Conference "Water quality technologies and management in Bulgaria" and Third Seminar "Private participation in water supply and sewage services, 20-22 February"*. Sofia, Bulgaria, Bulgarian National Association of Water Quality.

## Key contact organisations in CEE countries

1. The Central and Eastern Europe Regional Technical Advisory Committee (CEETAC) of the Global Water Partnership  
VITUKI. Water Research Center. PO Box 27. Kvassay Jenö ut.1., H-1435 Budapest 92.  
Tel/Fax +361 215 3043,  
E-mail: gayerjosef@vituki.hu
  
2. Bulgaria
  - Bulgarian Water Supply and Sewerage Association – BAWQ. BG-1202 Sofia  
17-19 Kirit y Metdii Str. Floor 5 Room 509  
Tel.: +359 255 7076, Fax +359 256 48661 E-mail: waterql@ttm.bg
  - Bulgarian National Association on Water Quality – BNAWR. BG-1233 Sofia  
137 Hristo Botev Blvd. Floor 2, Room 18  
Tel/Fax +359 233 5049; 359 2987 4251 E-mail: waterql@ttm.bg
  
3. Estonia  
Estonian Water Works Association  
Adela 10, Tallin 10502, PK 174  
Tel. +372 626-24-58; Fax +372 672-10-63  
E-mail: evel@tvesi.ee
  
4. Czech Republic  
Water Research Institute  
Podhabska 30. 16062 Prague 6  
Tel. 421 7 343 345; Fax 421 7 315 743  
E-mail: sciesecr@vuvh.cz
  
5. Hungary  
Hungarian Professional Association of Water and Sewerage Companies  
1368 Budapest pf 201  
Tel. +361 353 3241; 331 8382; 312 3066  
Fax +361 1302 7600; 353 3241; 331 8382
  
6. Latvia  
Latvian Water and Waste Water Works Society  
Bezdeliguiela 12, Riga LV-1007  
Tel./Fax +371 62-46-93  
E-mail: ralfs@taurins.lv

## 7. Lithuania

Lithuanian Water Supplies Association

Luki\_kiu g. 5-506, 2600 Vilnius

Tel. (370 2) 22 4678; Fax (370 2) 22 4960

E-mail: ivta@iti.lt

## 8. Poland

- Polish Association of Sanitary Engineers and Technicians

Czackiego 3/5; 00-043 Warsaw

Tel/Fax 48 22 82 2894

E-mail: Biuro@pzits.pl

- Izba Gospodarcza "Wodociagi Polskie" (Commercial Chamber "Polish Waterworks")

ul. Kasprowicza 2; 85-073 Bydgoszcz

Tel. 48 52 328 7822; Fax 48 52 322 6294

E-mail: cgwp@telmax.compl

## 9. Romania

Romanian Water Association

202A Splaiul Independenta, 9 Floor, 6 Sector

78 123 Bucharest

Tel. +401 410 3958; Fax +401 410 3872

E-mail: ara@fx.ro

## 10. Slovakia

Dept. of Sanitary Engineering Slovak Technical University

Radlinského 11; 813 68 Bratislava

Tel. 42 17 529 20631; Fax 42 17 529 21184

E-mail: kris@svf.stuba.sk

## 11. Slovenia

Slovenian Water Pollution Control Association

Hajdrihova 19; SI-1000 Ljubljana

Tel. 386 61 176 0200; 386 61 125 9244

E-mail: milenko.ros@ki.si

