Chapter 2

Recent trends and current status

This chapter provides comparable data on recent trends and current performance of water supply and sanitation systems in EECCA. It draws on a set of indicators of both the technical and financial performance of water utilities. It discusses the specific challenges in rural areas, given that coverage rates tend to be much lower, with self-provision, rather than piped networks, being an important form of supply. It elaborates on the consequences of inadequate service quality on health and the environment.

Overview of the chapter

Improved sustainability of water and sanitation services in EECCA has been contrasted. Overall, WSS performance has tended to continue to decline, although there are substantial differences from one country to the next and/or within some countries (especially between rural and urban areas and small cities versus large cities).

Countries' performance in improving service quality (or stemming further deterioration) has not been clearly linked to their macro-economic performance, as some countries that have registered strong growth during the decade have not prevented the decline of their water and sanitation sectors, whereas some countries that did not perform so well economically were able to make better progress in this regard.

Although a large proportion of the urban population is connected to networked supplies (especially when compared with countries at similar income levels) largely due to historical factors, the quality of the services that they receive is often inadequate and has, in some cases, been declining. In such cases, lack of maintenance means that further deterioration is likely, unless significant reforms and investments are carried out.

The financial performance of water utilities remains a source of concern, as in four countries, utilities are barely recovering their operational costs from user charges (not to mention maintenance and capital costs). Although there have been some significant improvements in terms of revenues (due to a combination of higher tariffs and improved bill collection), tariffs have remained low (below USD 0.4/m^3 in seven countries in the region) and cost recovery has not significantly improved as costs have also increased; collection efficiency has stagnated or even decreased in many EECCA countries.

Sanitation is the biggest challenge in the region. Data gathered by the OECD and other organisations (including the World Bank) suggest a worrying situation. Access to sanitation in urban areas is comparatively high, but the situation at regional level is not improving. Even where wastewater collection exists, wastewater is not treated as most treatment plants are not functioning (e.g. see OECD/EAP Task Force, 2008b). Incoming wastewater is primarily discharged, without treatment and disinfection, directly into the water bodies.

Service deterioration has been particularly felt in rural areas. About 20% of the rural population in EECCA does not have improved access to safe drinking water. Progress is slow and the sector is seriously under-financed, as rural areas are receiving comparatively less attention than large towns.

Inadequate water and sanitation services generate substantial costs for the economy as a whole. Water-borne diseases are significantly more prevalent than in OECD countries, which results in comparatively high child mortality rates. Given that municipal wastewaters are discharged without treatment into surface waters, this results in high levels of surface water pollution and associated environmental impacts, such as eutrophication.

Initial condition of the water supply and sanitation sector

The availability of massive public funding during the Soviet period allowed the development and maintenance of utilities infrastructure at a reasonably high level (comparable to that achieved by developed countries) in terms of the percentage of the population with access to networked water supply and sanitation services. The infrastructure built during the Soviet era was relatively reliable albeit capital intensive. This can be explained by the fact that, at the time, the benchmark water consumption (consumption norms) and the planning standards (including the spare capacity in the event that water consumption grows in the long-term) were set at an excessively high level (frugal water consumption was not encouraged at that time). Public financing of capital expenditures was provided, thereby keeping household utility bills down.

The breakdown of the Soviet Union triggered numerous changes in EECCA countries. In the 1990s, in most countries, utility payments were not sufficient even to cover operational costs. Operating costs were largely financed through higher tariffs for industrial consumers (in the form of cross subsidies). Overall difficult economic conditions generated huge financial gaps, as allocated public funds were insufficient to adequately maintain, let alone develop, water supply and sanitation networks. This resulted in sharply deteriorated performance of water supply and sanitation services and increases in breakdown rates of occasionally maintained and renovated facilities. In many places, it was not possible to maintain access to water supply services, and some wastewater treatment facilities simply stopped operating.

Defining relevant performance indicators in the EECCA region

Water and sanitation services performance can be tracked in a number of ways. At the international level, considerable emphasis is placed on tracking progress based on coverage targets. These are usually defined as per the Millennium Development Goals (MDGs), which aim to reduce by half the number of people without access to improved water and sanitation between 1990 and 2015. The Joint Monitoring Programme (JMP), managed jointly by UNICEF and WHO, is in charge of monitoring achievement of these targets at the global level (see Box 2.1 for more details).

Box 2.1. The Joint Monitoring Programme (JMP)

MDG Target 7c calls on countries to halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation. In order to estimate access to basic sanitation and to safe water JMP is required to use two MDG indicators: 1) the proportion of population using an improved sanitation facility; and 2) the proportion of population using an improved drinking-water source. An improved sanitation facility is defined as one that hygienically separates human excreta from human contact. An improved drinking-water source is one that by the nature of its construction adequately protects the source from outside contamination, in particular with faecal matter.

At country level, differences may be observed in the figures on the use of drinking water sources and sanitation facilities presented by different agencies. Often there are also differences between national estimates and those at the MDG level. At the origin of these discrepancies lies the issue of institutional fragmentation. Responsibilities for rural drinking-water and sanitation may be with different national bodies, who may each apply their own monitoring definitions, methods and procedures. The same is true, often at the municipal level, for urban drinking water and sanitation.

The 1990 baseline was estimated for the first JMP report using the data available at that time. However, as the monitoring exercise has continued to gather momentum, an increasing number of new data sources become available each year. From a methodological standpoint, JMP takes the view that the estimates in each successive report should be as accurate as possible. This means using all the available data – not only estimating access for the most recent year, but also recalculating the estimates for earlier years if more data have come to light. Consequently, these new estimates may affect the baseline values, the trends, and the projections for 2015, the target year.

Source: WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (2010).

Tracking performance against the MDG targets in the EECCA region generates a number of difficulties, however, and as a result, does not allow for an accurate measurement of progress (or lack thereof) in terms of service delivery:

- Water coverage with piped connections is usually high in the region, thanks to extensive infrastructure investments carried out during Soviet years, including in water and sanitation. Having a household tap does not guarantee sustainable access to an improved service, however. Much of the Soviet infrastructure is oversized and costly to operate. As a result, this infrastructure has been insufficiently maintained over the years, leading to service deterioration. This manifests itself through the deterioration of water and service quality, or through high levels of non-revenue water in most EECCA countries, which considerably exceed the international benchmarks for water losses. Whereas in most developing countries, improving access to safe water and basic sanitation may call for building new infrastructure, a critical priority in EECCA countries therefore consists of maintaining, renovating and in some cases, down-sizing infrastructure (when oversized assets are expensive to operate).

- Using 1990 as the base year is particularly inopportune in EECCA countries. In 1990, access to water supply and sanitation was already high, and the region was entering a period of political turmoil which led to numerous governance changes in the region and severe drops in industrial outputs. Sharp reductions in public spending and in household revenues led to a drop in financing allocated to WSS around that time. Therefore, taking 1990 as a reference year for the water related MDGs amplifies the size of the challenge.

- Statistical data needed to calculate the MDG indicators for 1990 is absent in many EECCA countries or is unreliable. Homogenous statistical data series were interrupted with the breakdown of the Soviet Union. On a number of items, pre-1990 data are either unavailable or incomplete.

Given the limitations of using coverage as the main performance indicator in EECCA countries, it is essential to examine a broader range of performance indicators, which may vary for each of the sub-sectors

(*i.e.* urban water, urban sanitation, rural water and rural sanitation). As a result, data considered in this report to track performance comes from different sources, including the UN Joint Monitoring Programme, the World Bank IBNET database and the EAP Task Force Water Utility Performance Indicator Database (see Box 2.2).

Box 2.2. The EAP Task Force Water Utility Performance Indicator Database

The data presented below has been collected in the framework of several projects aimed at promoting the use of performance benchmarking in EECCA water utilities. The indicator methodology that has been used was developed by the World Bank.

The data set is based on input from water utilities in nine EECCA countries (Armenia, Azerbaijan, Georgia, Moldova, the Russian Federation, Ukraine, Tajikistan, Kazakhstan, and the Kyrgyz Republic). The data was collected by the World Bank and the EAP Task Force, through special surveys conducted in the region on the basis of self-reporting by the utilities. In many of the smaller EECCA countries (such as Armenia, the Kyrgyz Republic, Georgia and Moldova), the survey was nearly comprehensive, covering all major utilities. For Ukraine, Tajikistan and Kazakhstan the data was collected from the largest utilities only.

The data-set for the Russian Federation has been significantly expanded compared to previous updates of the data-base, and is now based on the data compiled by the national statistical office (statistical reporting is mandatory for all Russian Water utilities). This allows portraying a more comprehensive picture of recent developments in the country.

The database contains 32 indicators, including technical (*e.g.* service coverage rates, non-revenue water, pipe breaks, and continuity of service), and financial indicators (*e.g.* bill collection period, collection ratio, unit operational cost, and average water revenue per m^3 of water sold).

Information that feeds into the database can be accessed on the website of the international benchmarking network for water and sanitation (IBNET; see The International Benchmarking Network for Water and Sanitation Utilities (IBNET), *www.ib-net.org/*.

Table 2.1 provides a summary of key performance indicators for water and sanitation services in the EECCA region based on the results of such database.

Table 2.1. WSS sector performance in EECCA countries (2008)

Country	Improved water source (% of pop. with access)		Connected to centralised water supply (% of population)		Improved Sanitation facilities, (% of population with access)		Connected to centralised sewer (% of population)		Average Daily water supply, urban	Non-revenue water	Collection rate	Mortality Rate, children under 5
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Number of hours	%	%	per 1000 live births
Armenia	98	93	97	53	95	80	60	15	8	84	87	23
Azerbaijan	88	71	85	25	51	39	45	5	7	47	72	36
Belarus	100	99	97	48	91	97	97	32	24	18	87	13
Georgia	100	96	96	67	96	93	93	29	4-24	43	114	30
Kazakhstan	99	90	78	35	97	98	84	10	18	-	-	30
Kyrgyz Republic	99	85	82	58	94	93	68	28	16	-	-	38
Moldova	96	85	56		85	74	-	-	23	42	**99**	**17**
The Russian Federation	98	89	89	46	93	70	87	35	24	20	85	11
Tajikistan	94	61	93	49	95	94	20	5	18-24	-	-	64
Turkmenistan	97	-	85	42	99	97	62	2	18	-	-	48
Ukraine	98	97	99	-	97	90	67		16-24	-	**-**	**15**
Uzbekistan	98	81	90	71	100	100	85	40	18	-	-	38
EECCA average	**98**	**90**	**90**	**49**	**93**	**80**	**80**	**37**	**21**			**19**

From table on previous page

Notes:

1. Interstate statistical Committee of the Commonwealth of Independent State: *www.cisstat.com/2base/frame01.htm.*

2. Interstate statistical Committee of the Commonwealth of Independent States: *www.cisstat.com/2base/frame01.htm.*

3. Water is only one of factors having an impact on infant mortality rate. Other factors such as the quality of the health care system and of food supplies play an equally important role. There is therefore not necessarily a direct link between the level of access to an improved water source and this health indicator.

Source: World Bank, World Development Indicators, February 2011; WHO and UNICEF, 2010 update, Progress on sanitation and drinking water (for mortality rate); IBNET (for non-revenue water and collection rate), March 2011. The EECCA average is a weighted average based on the number of inhabitants in each country. Non-revenue water and collection rates have not been averaged for lack of data in a great number of countries.

Urban water sub-sector: Key technical performance indicators

Key technical performance indicators suggest that the overall status of the urban water sub-sector in EECCA stagnated over the 2004-08 period.[1]

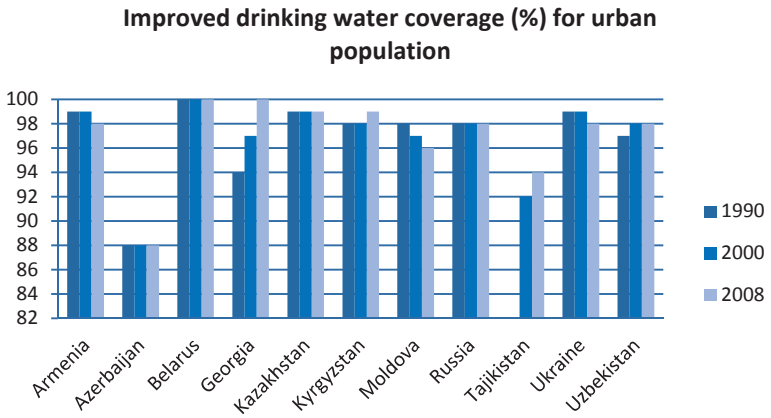
Even though several EECCA countries enjoyed substantial economic growth during the decade, WSS service performance has not been correlated with economic performance in a number of countries. For example, in Azerbaijan, where GDP growth has been spectacular (16.4% annual average growth between 2000 and 2008), the service has not significantly improved over the decade. In Georgia, despite an important average annual GDP growth (6.9%), continuity of service dramatically decreased (from 18 hours/day in average in 2000 to 11 hours/day in 2008). In Ukraine, which had similar GDP growth to Georgia over the decade, the share of the urban population with access to piped water decreased from 94% in 2004 to 80% in 2007. Overall, service performance has deteriorated in a number of countries, largely due to the lack of maintenance and asset deterioration.

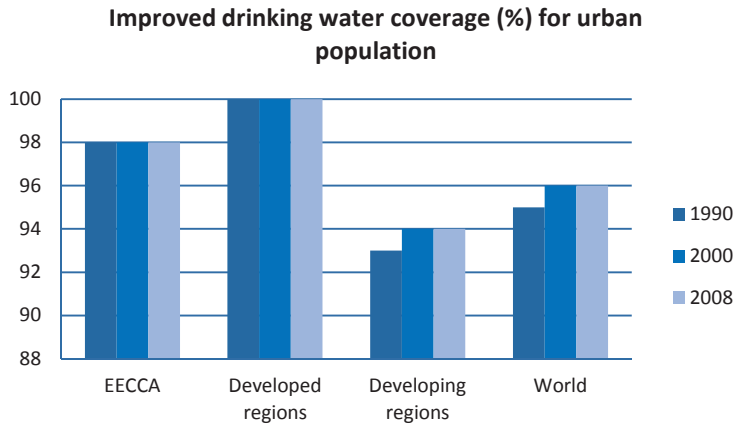
Access to improved water supply in urban areas is comparatively high and stable

According to the JMP, access to improved drinking water sources has remained high in urban areas, although it has not increased over the decade, as shown in Figure 2.1 below.

Figure 2.1. Improved drinking water coverage in urban areas

EECCA vs. other regions (1990-2008)





Source: WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (2010), Progress on Sanitation and Drinking Water: 2010 Update, WHO, Geneva.

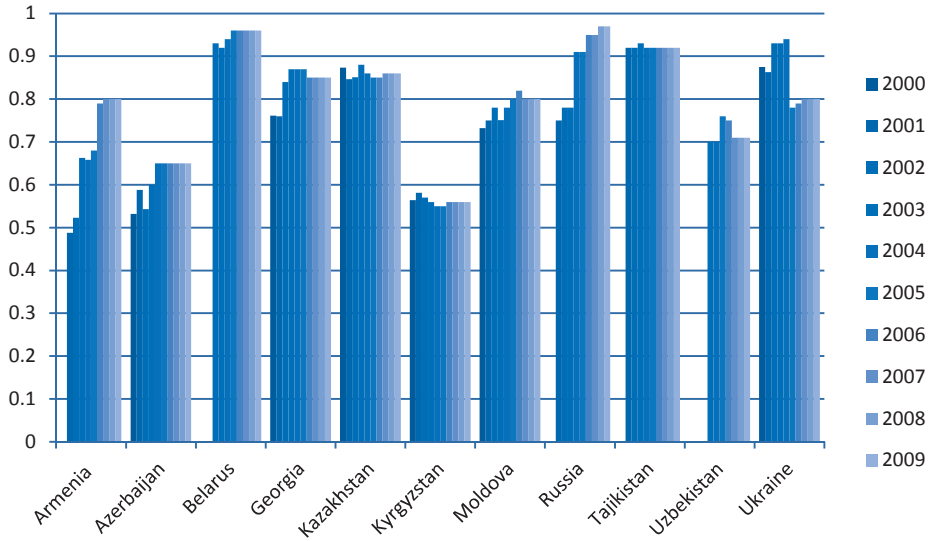
Progress in access to improved water source has been patchy. Whereas Georgia accomplished substantial progress and was able to reach full coverage over the decade (starting from a comparatively low level in 1990), other countries, including Moldova and Ukraine, have seen a decline in improved drinking water coverage during the period.

Progress in access to WSS since 2004 did not correlate strongly with overall economic performance. Eight out of twelve countries had improved access between 2004 and 2008. Among those, Armenia performed particularly well, but so did countries with less solid economic growth such as Georgia, Kazakhstan and the Kyrgyz Republic. The situation improved

marginally in some countries (including Azerbaijan, although urban coverage there is at only 88%, *i.e.* the lowest in the region and lower than the developing world average). It remained stable in two (the Russian Federation and Turkmenistan), and deteriorated in Moldova and Ukraine.

Access to piped water supplies in urban areas is also high in the region, especially when compared to other countries with similar levels of development. In a few cases, such as Armenia, Georgia or the Russian Federation, piped water coverage has improved markedly since 2000. However, it has stagnated or even declined for at least 8 out of 12 countries in the region. Countries with the lowest connection rate to piped water sources include Central Asian and Caucasus states: in Kazakhstan, the Kyrgyz Republic and Uzbekistan, access has marginally declined over the period. In Uzbekistan, centralised sanitation services were available to 39% of people living in towns and 1.5% of rural inhabitants (see OECD, 2010b).[2]

Figure 2.2. Coverage of urban population in EECCA with piped water supply



Source: EAP Task Force Water Utility Performance Indicator Database, June 2011.

One key concern is that "having access" does not necessarily mean regular supplies of an adequate quality, however. Although low-income countries in the region report a relatively high level of access to water services (especially when compared with countries with similar levels of income), high rates of access reflect the presence of infrastructure (put into operation in the Soviet times and not maintained properly since then), but in some countries, the infrastructure is in such a serious state of disrepair that,

for many urban dwellers, having a water tap does not mean having sustainable access to safe drinking water.

Even though the United Nations JMP concludes that the EECCA region is essentially on track to meet the internationally agreed MDG target for drinking water, it is important to stress that UN data only measures access to an "improved" water source (*i.e.* available at the turn of the tap in homes, from a standpipe, from a protected well, etc.). It does not take into account the quality of the service and safety of the water that comes out of the tap or well. It does not monitor appropriate maintenance of the system either, and there is no guarantee that water supplied today will remain safe in the future.

In some cases, although "access to improved water supplies" has been maintained, customers have been faced with a sharp deterioration in service quality. For example, if they previously had access to water through a tap at home and now have to rely on a communal standpipe, they would still be considered as having access to "improved water" although the convenience of the service (and therefore customers' ability to maintain hygienic practices) has obviously dropped. Box 2.3 below gives an example of such "slipping standards", with a deterioration of drinking water quality linked to a worsening wastewater situation in Georgia.

Box 2.3. WSS in Georgia: An example of "slipping standards"

Most of the settlements in Georgia receive water with interruptions. There is no accurate registration of water produced and consumed. The situation is worsened by a lack of laboratory water control, which means that supplied water rarely complies with national standards and sanitary and epidemiological requirements.

The more alarming problems exist in collection and treatment of domestic sewage and industrial wastewater. The energy crisis which ensued from the dissolution of the Soviet Union, and subsequent significant increases in electricity tariffs, generated a lack of financing which has negatively influenced almost all wastewater treatment facilities in the country. The technological processes were interrupted, the micro-organisms used for biological treatment were lost, pipes and conduits were clogged up. Therefore most wastewater treatment facilities have become disabled, and the wastewater is discharged untreated into the open water bodies and therefore ultimately causes contamination of rivers and basins of the Black and the Caspian seas. Such contamination of water resources is the main reason for mass intestinal and infectious diseases in Georgia.

This situation exemplifies the fact that having access to an "improved water source" according to the MDG definition does not always mean having access to safe water, and can even hide a service deterioration.

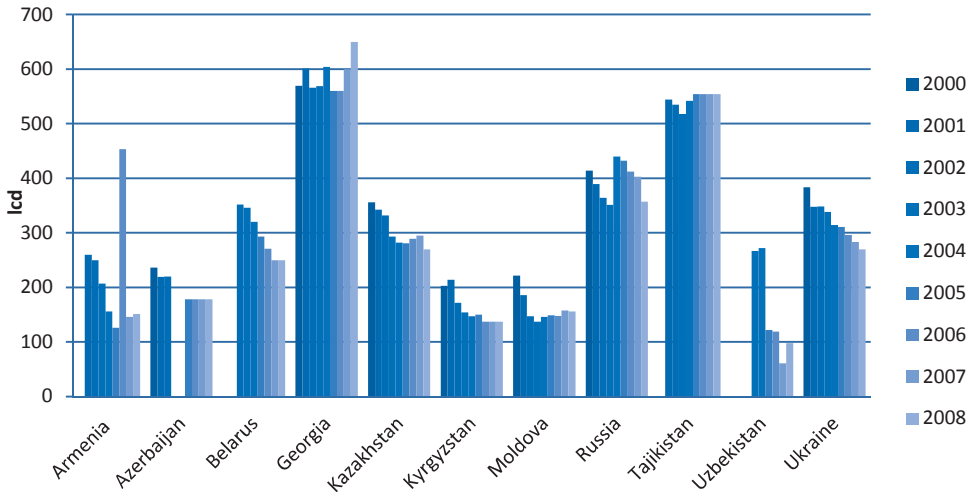
Source: OECD (2005c), *Support to Georgian Government in Developing and Implementing Financial Strategy for Urban Water Supply and Sanitation in Georgia and Carrying out the Feasibility Analysis*, OECD, Paris.

Water consumption remains high compared to international standards

Water consumption can be a useful indicator about the operational performance of the infrastructure and its environmental consequences. Per capita consumption remains high in EECCA, although the consumption rates declined in most countries over the past few years. These high consumption levels reflect low metering rates in these countries, or inappropriate consumption norms.

There is ample room for improvements in terms of reducing water consumption, especially in countries with very high consumption levels such as Georgia, the Russian Federation or Tajikistan. In Western Europe, water consumption stands at 110-140 litres per capita per day. Such results were achieved due to the application of various measures to manage the demand for water, disseminate water saving technologies and reduce water losses. Introducing water saving measures can reduce the sector dependence on budget financing. It can make it commercially attractive for private operators and investors, and improve service quality. It is a condition for improved environmental performance and a sustainable development.

Figure 2.3. Water consumption in EECCA



Source: EAP Task Force Water Utility Performance Indicator Database, June 2011.

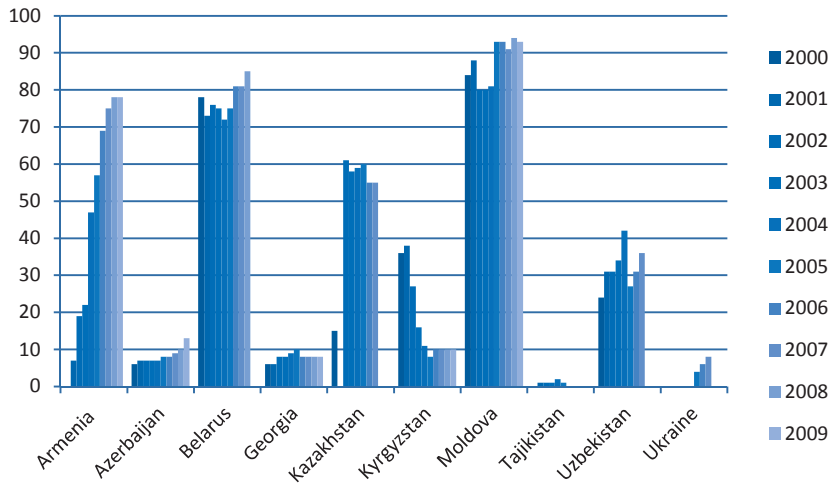
Overall, metering rates are relatively low in the region. Some EECCA countries introduced large-scale metering programmes for households, but the experience was controversial in some cases. Moldova has been among the first to use water meters. Nationwide installation of water meters led to significant reduction in user charges revenue because of differences between

housing water consumption norms and the volume of water actually consumed based on meter readings. This generated a difficult financial situation for WSS utilities. Besides, cross-subsidising of domestic water tariffs at the expense of commercial and industrial users prompted many of them to drill their own boreholes instead of using water supply services. This again reduced revenues from user charges for water utilities.

Armenia has taken drastic actions to increase water metering. To that end, a water use metering strategy was designed and implemented. This helped reduce water consumption, water leaks, production costs, and increase collection rate. In Yerevan, Armenia, a metering programme reached more than 80% of connections. This has significantly driven down consumption, which is now in line with Western Europe averages. Yet the problem of how to accurately meter water use in multifamily houses/ apartment blocks persists. While attention focused on metering domestic (indoor) water use, unaccounted-for water related to water supplies to apartment blocks has grown and generated significant losses for utilities.

In Azerbaijan, a state-funded programme for meter installation has been implemented since 2006. The plan has been delayed: although installation was expected to be completed by 2007 in Baku and 2008 nationwide, about 50% of users were metered as of mid-2009.

Figure 2.4. Share of metered connections in EECCA (2003-08)



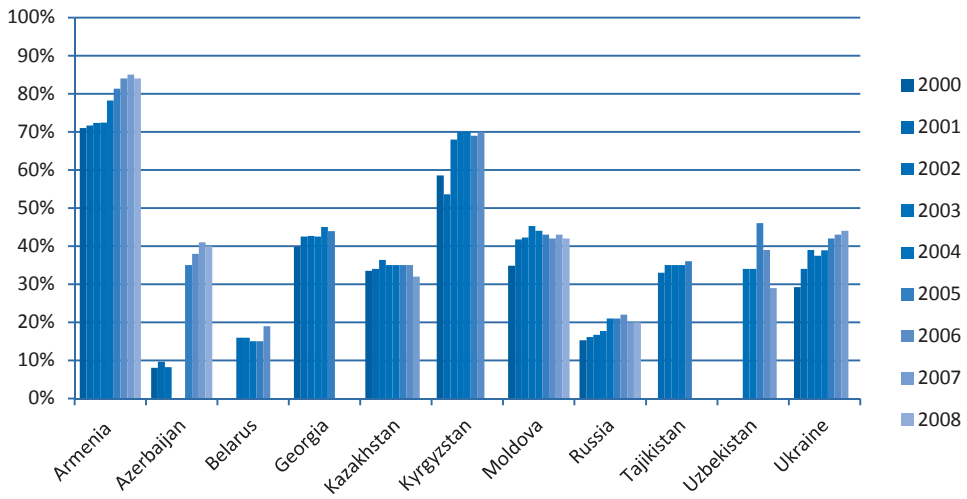
Source: EAP Task Force Water Utility Performance Indicator Database, June 2011.

Non-revenue water[3] in EECCA water supply networks considerably exceeds the international benchmarks for water losses

The lack of maintenance and reconstruction of outdated water distribution networks in the region results in high water losses in networks: non-revenue water can reach about 50 to 60% of the total volume of water delivered to the network, which is 4 to 5 times higher than best practices in adequately operated utilities in the Western Europe. Another factor contributing to high non-revenue water is poor-quality meters.

Relatively low reported levels of losses in the Russian Federation, Belarus and Kazakhstan partly derive from the fact that water is charged based on consumption norms which means that estimating actual losses is not obvious. By contrast, in countries where metering has been promoted and increased over the years, such as in Armenia and Ukraine, reported losses have increased significantly over the period. For example, very high reported losses in Armenia partly reflect the increased monitoring of infrastructure and diffusion of metering, as water utilities are now unable to bill water that is lost in the network.

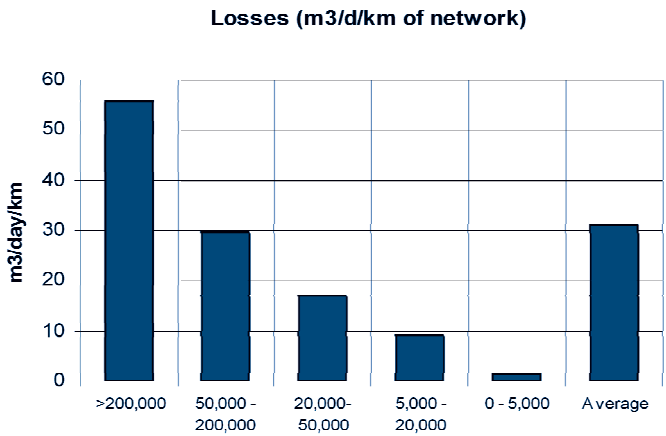
Figure 2.5. Non-revenue water in EECCA (2000-08)



Source: EAP Task Force Water Utility Performance Indicator Database, June 2011.

Measuring water losses per kilometre of network is a reliable indicator of the quality of the infrastructure. The figure below shows how performance in Moldova varies across different categories of settlements. Expressing the results in this form stresses the importance of reducing losses for the larger cities. By comparison, the average of the 20 water companies in the UK loose 7m^3/km/d, ten times less than in Chisinau (Moldova).

Figure 2.6. Water losses in Moldova by size of settlements

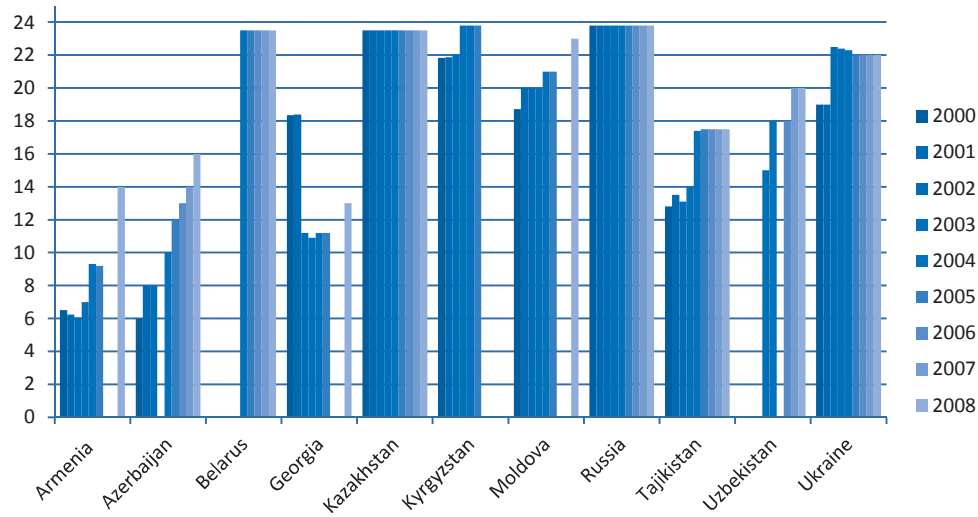


Source: OECD/EAP Task Force (2008b), *Facilitating Policy Dialogue and Developing a National Financial Strategy for Urban and Rural Water Supply and Sanitation in Moldova, Final Report*, OECD, Paris.

Continuity of service has improved but remains well below international standards in most countries

In the region, in urban areas, only four countries (Belarus, Kazakhstan, the Kyrgyz Republic and the Russian Federation) had services for 24 hours per day or close to this figure. There have been some improvements in recent years, such as in Ukraine, Moldova or Armenia (which started from very low levels), but performance has sharply deteriorated in Georgia.

Figure 2.7. Continuity of service in EECCA

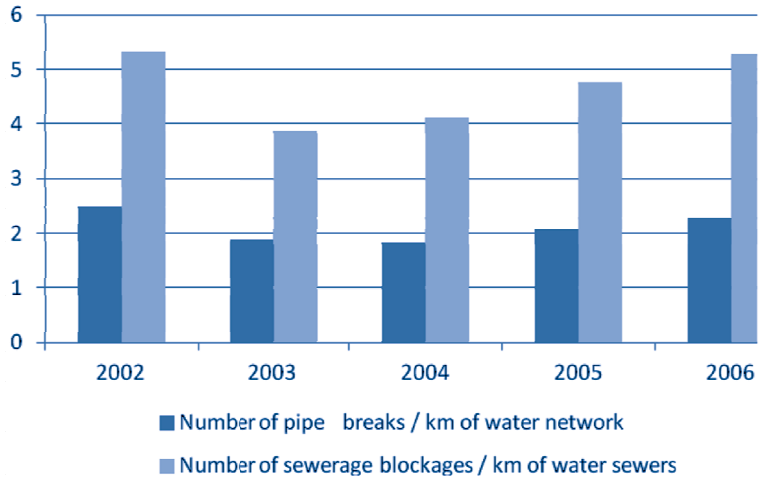


Source: EAP Task Force Water Utility Performance Indicator Database, June 2011.

Service interruptions can result in network contamination by micro-biological and other polluting infiltrations. They impinge on the quality of the water supplied, and increase the wear of the infrastructure. This, coupled with persistently high levels of pipe-breaks throughout the region, allows for cross-contamination between water supply and sanitation pipes, with significant consequences for public health (as discussed in a later sub-section).

As shown in Figure 2.8, the frequency of pipe breaks and sewerage clogs is increasing in many EECCA countries (after an initial drop between 2002 and 2003). This suggests that the slight improvement in continuity of supply is not linked to improved infrastructure, but rather to the fact that utilities are under less financial pressure to interrupt water supplies in order to save costs (*e.g.* by reduced electricity consumption of water pumps). The interruptions in supply are therefore increasingly likely to be due to technical factors (such as pipe breaks and sewerage blockages) than to cost saving measures.

Figure 2.8. Numbers of pipe breaks / sewerage blockages in EECCA (2002-06)



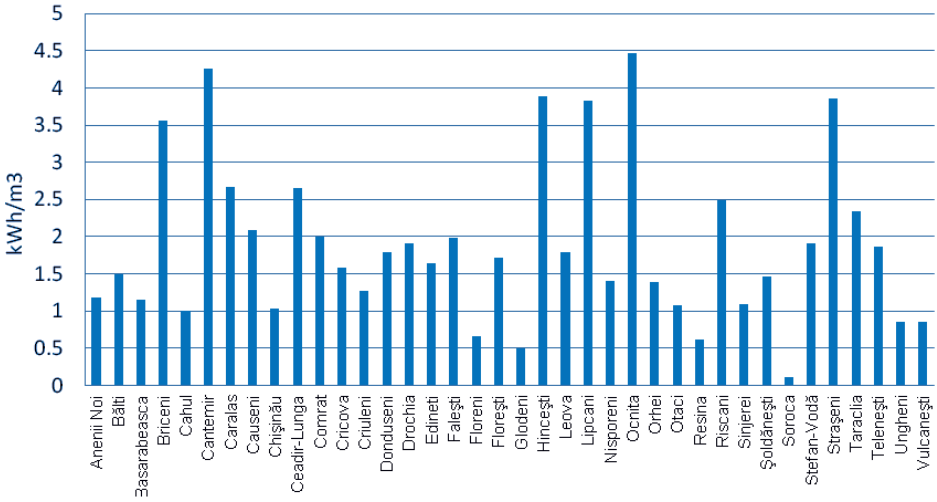
Source: EAP Task Force Water Utility Performance Indicator Database, June 2011.

High energy consumption results from the inadequate size of infrastructure and from the lack of hydraulic networks modelling

Infrastructure that is oversized (*i.e.* with a capacity much above actual demand) generates extra energy costs to pump the water and operate the equipments, which means that energy consumption tends to be high. Figure 2.9 shows energy consumption by various water utilities in Moldova: consumption fluctuates sharply depending on the terrain and water sources as well as inefficiencies in the water treatment process.

Oversized infrastructures derive from inappropriate planning, which does not take into account trends in water demand. In particular, water demand management (including metering) can significantly decrease volumes of water consumed by households and should be properly anticipated in infrastructure planning and capacity development.

Figure 2.9. Energy consumption in the water supply sector of Moldova

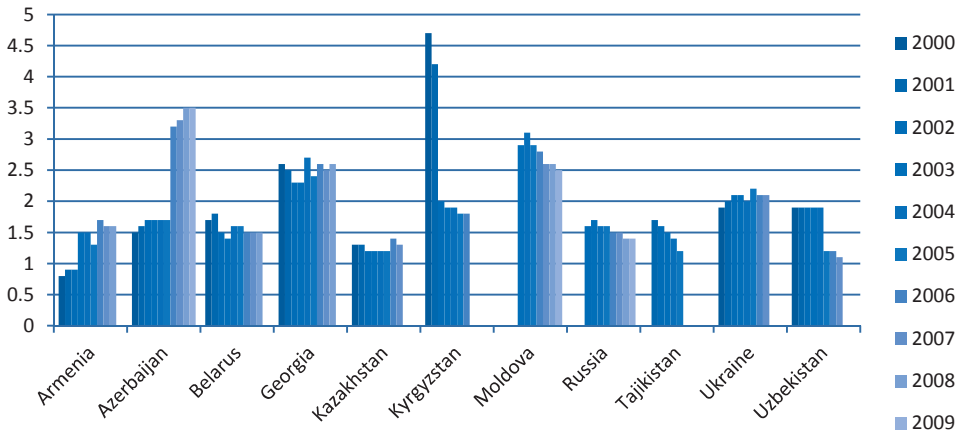


Source: OECD/EAP Task Force (2008b), Facilitating Policy Dialogue and Developing a National Financial Strategy for Urban and Rural Water Supply and Sanitation in Moldova. Final Report, OECD, Paris.

The ratio of staff per consumer is high by international standards and did not decrease significantly

The ratio of *vodokanals'* staff per population served is high in the region. A standard value in Western Europe is less than 0.5 (although it can be above 1 in Eastern Europe, such as in Poland). A high value may indicate inefficient use of staff, a low degree of automation and/or low wage levels. The staff ratio has remained stable over the period and has not been driven by reductions in volumes of water sold, as the utilities still have to operate the same oversized infrastructure and associated equipment. In the region, this ratio is almost consistently above 1.5 staff per 1 000 people served, except in Azerbaijan where the ratio has consistently remained below 1. There were sharp reductions in personnel in the Kyrgyz Republic, Tajikistan, Uzbekistan and Moldova. On the other hand, private operators have increased staffing levels in Armenia, partly to implement personnel-intensive activities such as metering campaigns.

Figure 2.10. Staff per 1 000 consumers (water supply only)



Source: EAP Task Force Water Utility Performance Indicator Database, June 2011.

Urban sanitation sub-sector: Key technical performance indicators

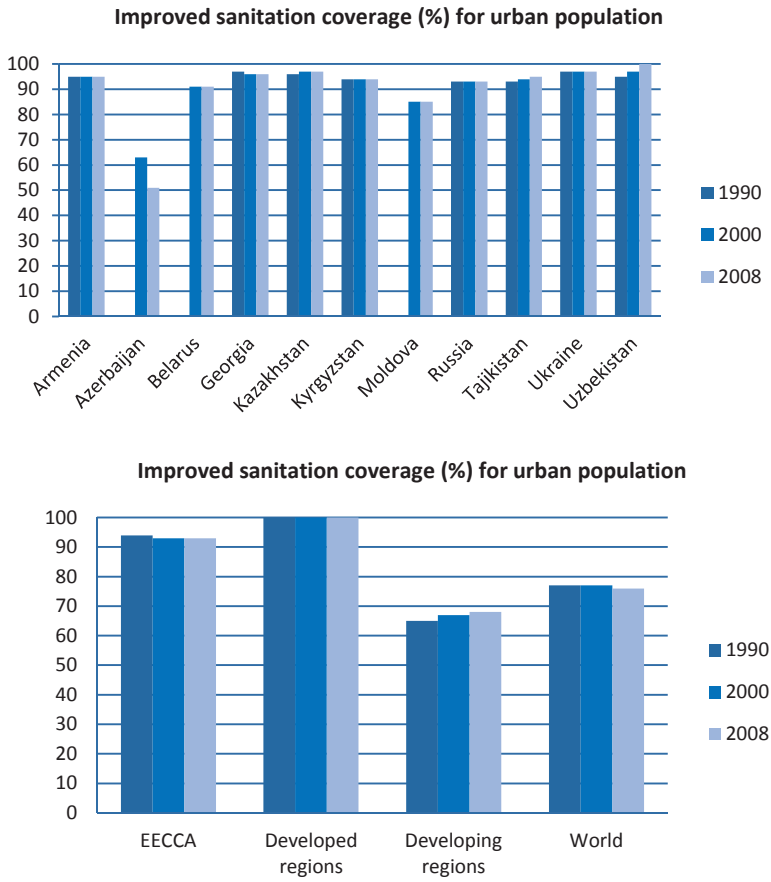
Sanitation is the biggest challenge in the region

Data gathered by the OECD and other organisations (including the World Bank) suggest a worrying situation. Access to sanitation in urban areas is comparatively high, but the situation at regional level is not improving (the picture is similar at world level). Access to improved sanitation has in fact deteriorated in Azerbaijan, Georgia, and Ukraine since the early 1990s.

Good economic performance over the decade has not been correlated with increased access to improved sanitation facilities. Reported statistics from Kazakhstan, the Kyrgyz Republic and Uzbekistan are significantly higher than they were in 2004, whereas the situation stagnated in the Russian Federation, Turkmenistan and Ukraine. Access performance even deteriorated in Azerbaijan, the country in the region that benefited from the strongest rate of annual GDP growth during the period but yet has the lowest improved sanitation urban coverage in the region, at a low 50%.

Figure 2.11. Access to improved sanitation in urban EECCA and compared with world regions

1990-2008



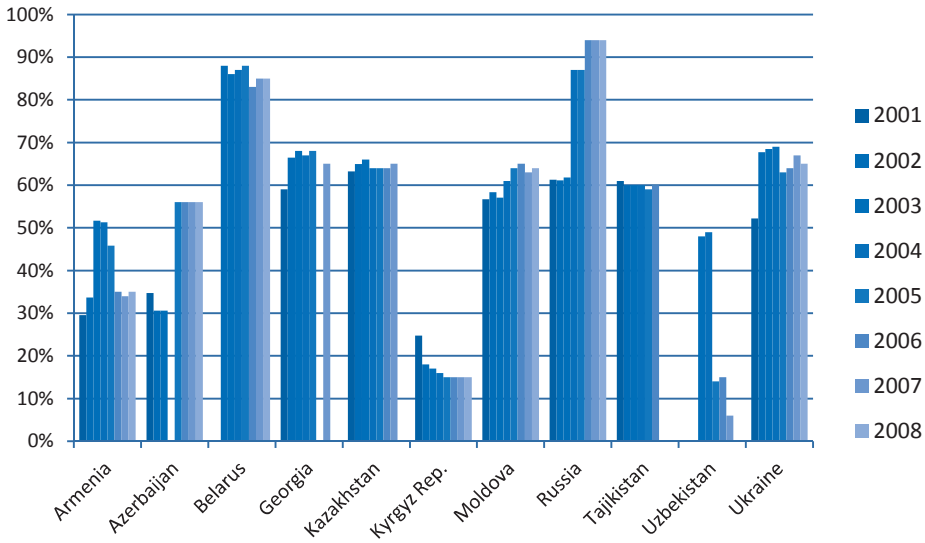
Source: JMP database, 2010.

Sewerage coverage rates are low

Sewerage coverage is significantly lower than access to improved sanitation, meaning that most wastewater is disposed directly into the environment without treatment. In several countries, wastewater collection only occurs in medium and large cities. Countries like the Russian Federation and Belarus have the highest wastewater collection rate as they also have the highest urbanisation levels. Progress has been erratic across countries. Decline in sewerage connection rates, as encountered in Armenia,

Belarus, the Kyrgyz Republic or Kazakhstan, reflects one of two situations: either network extensions could not keep pace with urban development, or the status of networks has deteriorated and they can no longer deliver services. Sewerage connection rates are lowest in Central Asia, where local latrines are the main technology for wastewater disposal.

Figure 2.12. Municipal wastewater connection rate in urban areas (2000-08)



Source: EAP Task Force Water Utility Performance Indicator Database, June 2011

The lack of wastewater treatment is a critical issue for many EECCA countries

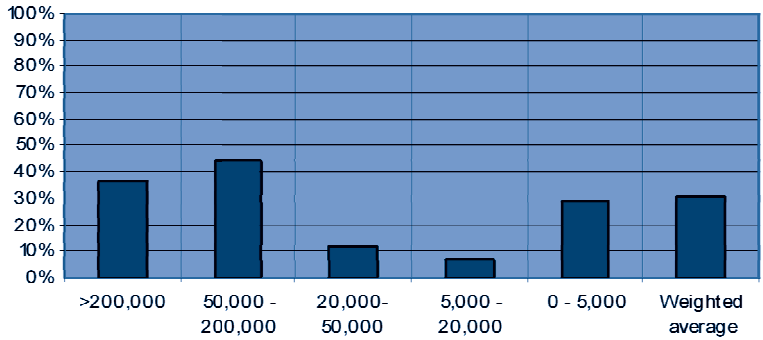
Even where wastewater collection exists, wastewater is not treated as most treatment plants are not functioning. Incoming wastewater is primarily discharged, without treatment and disinfection, directly into the water bodies. Several large cities discharge untreated wastewater into transboundary water courses. In some cases, advanced wastewater treatment was abandoned, because the economic situation did not allow continuing financing the operation of existing wastewater treatment plants.

In Georgia, all wastewater treatment plants started operations between 1972 and 1986. The mechanical treatment plants now work to a certain degree only in Tbilisi-Rustavi, Kutaisi, Tkieuli, Gori and Batumi. Most of the treatment plants are only partially operating. None of the biological treatment plants are operating. A considerable share of the incoming

wastewater is primarily discharged, without treatment and disinfection, directly into the water bodies.

In Moldova the treatment plants for the largest towns (Chisinau and Balti) perform reasonably well and meet water quality standards. However, the plants in all other towns have serious problems, and fail to meet the treatment standards. Before these plants are considered for rehabilitation, however, it would be necessary to revise the required capacity for such plants. In the past, oversized infrastructure generated financial and operational difficulties (see Figure 2.13 below). In certain cases, it would make more economic sense to build a smaller plant than to rehabilitate the existing one.

Figure 2.13. Utilisation of wastewater treatment plant capacities according to settlement size in Moldova



Source: OECD/EAP Task Force (2008b), *Facilitating Policy Dialogue and Developing a National Financial Strategy for Urban and Rural Water Supply and Sanitation in Moldova. Final Report,* OECD, Paris.

Key financial performance indicators for urban water utilities

The financial performance of water utilities remains a source of concern. In several countries, utilities are barely recovering more than half of their operational costs from user charges. Operational costs remain high, in part due to inadequacy of oversized infrastructures with declining demand. Tariffs have increased, but remain low in most countries. Payment discipline has improved.

It is likely that the current economic and financial crisis, which has badly hit EECCA countries, will reduce opportunities to generate additional revenues from water tariffs. It follows that the financial sustainability of water services in the region remains very weak and that no or very little resources is and will be available for maintenance and capital investment.

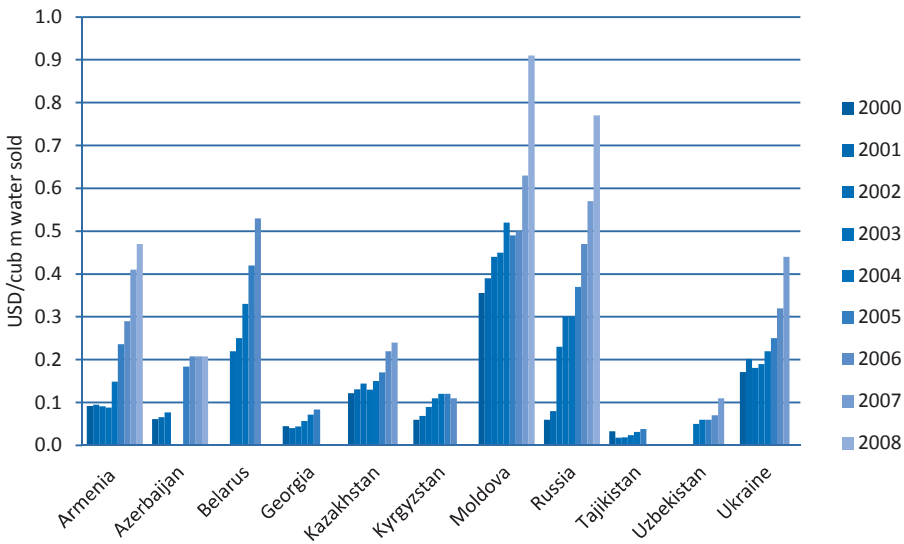
This section focuses on drivers for cost-recovery at utility level. Chapter 4 provides additional information on the reforms associated with tariff policies (for instance as regards tariff setting procedures, tariff structures and affordability issues).

Tariffs have increased steadily in some countries

Revenues from water sold remain very low in the region, with tariffs standing at or below 0.4 USD/m^3 in seven out of twelve countries. This clearly is not sufficient to cover operation and maintenance costs of water and sanitation services. Tariffs should be a key element of the financial sustainability of the water and sanitation sector, as they provide stable and reliable revenues to the service provider (as opposed to subsidies or even transfers from official development assistance).[4]

Data show marked increases in revenues from water services in the region, especially in Moldova and the Russian Federation. This results from a combination of higher tariffs and improved bill collection. In selected countries, revenues from water sold increased most significantly in the context of improved macroeconomic performance in the region (from 2004 to 2008). However, revenues in Azerbaijan, Georgia, Kazakhstan, the Kyrgyz Republic, Tajikistan, and Uzbekistan remain close to their 1990 level and only partially benefitted from the overall improvement in the economic situation over the 2004-08 period.

Figure 2.14. Average revenue from water sales in EECCA

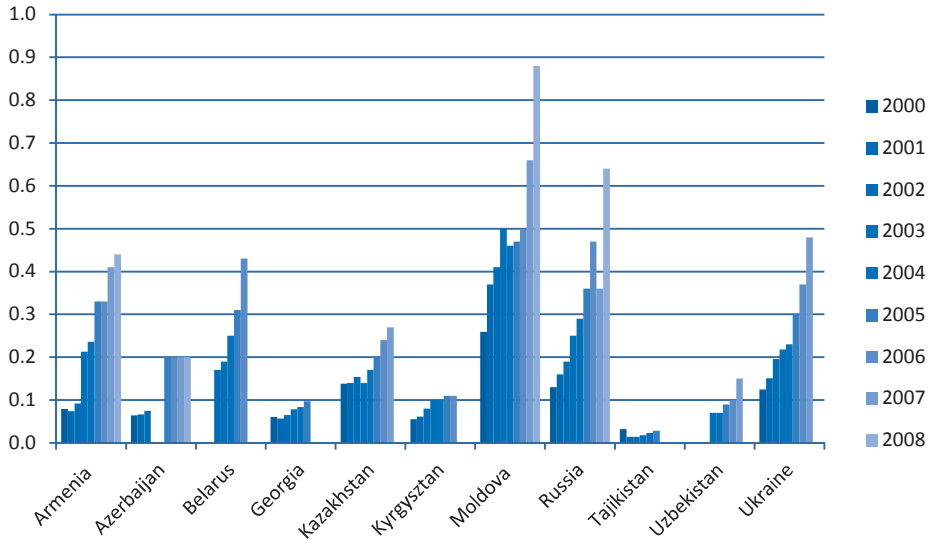


Source: EAP Task Force Water Utility Performance Indicator Database, June 2011.

Water tariff increases have not allowed to improve cost recovery levels

Coverage of operating costs through tariffs has improved slightly, but progress is slow. One reason is that operating costs have risen over the period. Energy costs usually represent a large part of these costs, especially in oversized systems. Figure 2.15 below shows that operating costs have increased sharply where energy consumption is high, such as in Moldova (see also Figure 2.9 for variations in energy consumption in different water companies across Moldova).

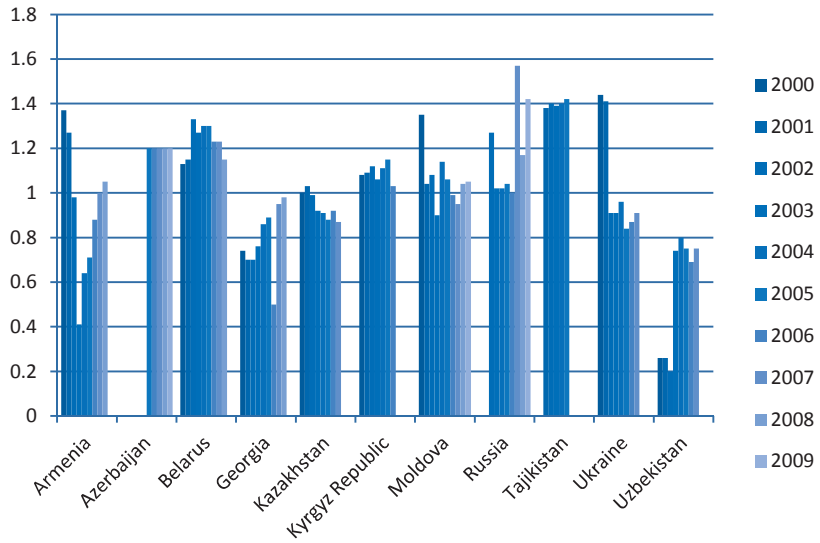
Figure 2.15. Unit operational cost of water utilities in EECCA (2000-08)



Source: EAP Task Force Water Utility Performance Indicator Database, June 2011.

Only six out of twelve countries have operating cost coverage ratios above one. The situation is financially not sustainable in the other half of the region. It is unlikely that revenues from water sold in EECCA countries can finance appropriate maintenance and capital expenditure.

Figure 2.16. Ratio of water tariffs on operating costs in EECCA (2000-10)



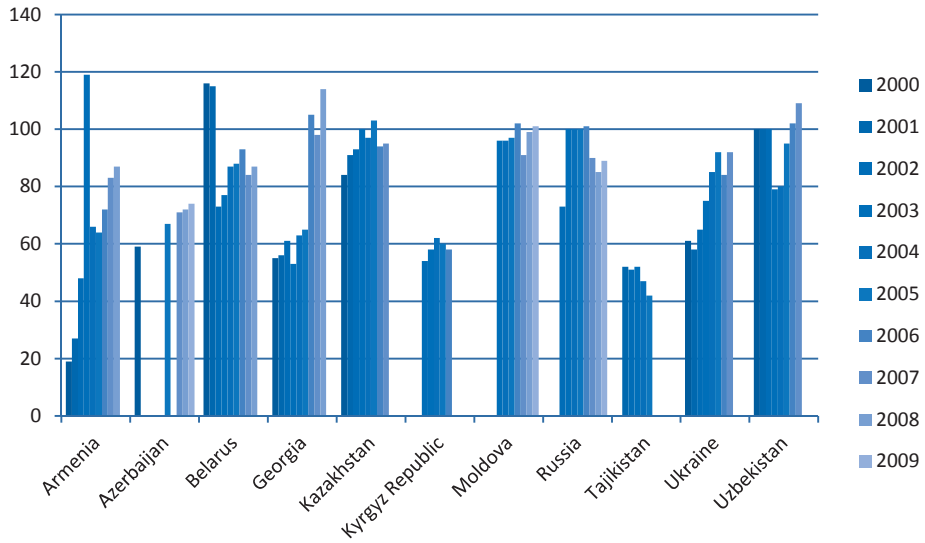
Source: EAP Task Force Water Utility Performance Indicator Database, June 2011.

Some countries are considering or taking measures to control costs and improve capacity by better invesment planning, incentives for operational efficiency, or by aggregating water utilities into bigger units (see Chapter 3 for more information on ongoing aggregation reforms).

Payment discipline has improved significantly, but the financial crisis might challenge this in future

Collection rates are high in most countries, at above 80% for 7 out of 12 countries. This results from increased payment discipline. Given that tariffs are low, water services are usually affordable for a vast majority of consumers, which most likely contribute to this good payment records. Industrial billing and collection is reported to be 100% in all countries. Collection rates for household tariffs are rising everywhere, especially when metering is implemented. However, collection rates tend to drop dramatically when tariffs increase rapidly. In some countries, *e.g.* Uzbekistan, collection rate is higher than billing due to the repayment of outstanding debts accumulated in previous years.

Figure 2.17. Collection rate as a percentage of billing in EECCA (2000-10)



Source: EAP Task Force Water Utility Performance Indicator Database, June 2011.

Rural water supply and sanitation

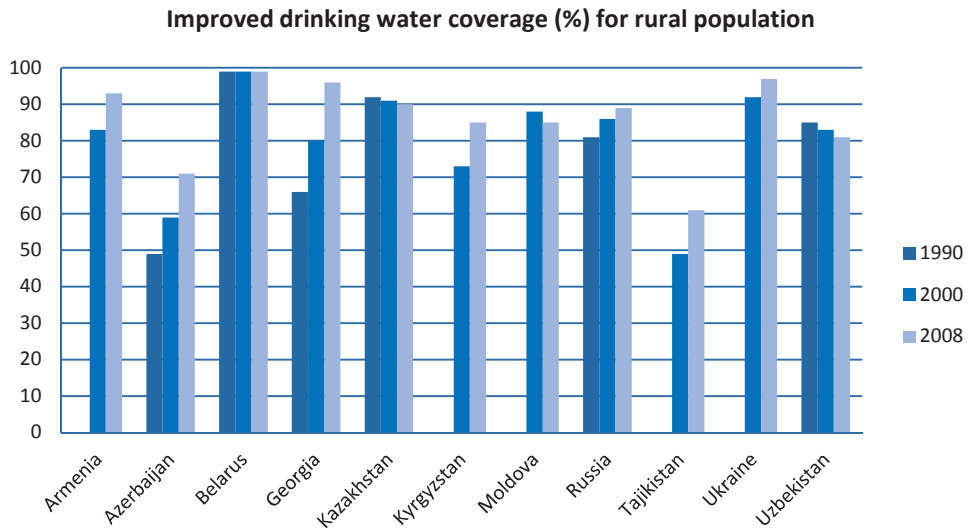
The situation in rural areas illustrates the contrasts across the EECCA region. About 20% of the rural population in EECCA does not have improved access to safe drinking water. Progress is slow. The sector is seriously under-financed. This results from inappropriate institutions, low to no tariffs (*e.g.* in the Kyrgyz Republic, only 25% of population living in villages outside the service areas of water utilities pay for water), poor bill collection, and – until recently – low priority of rural water supply and sanitation for governments.

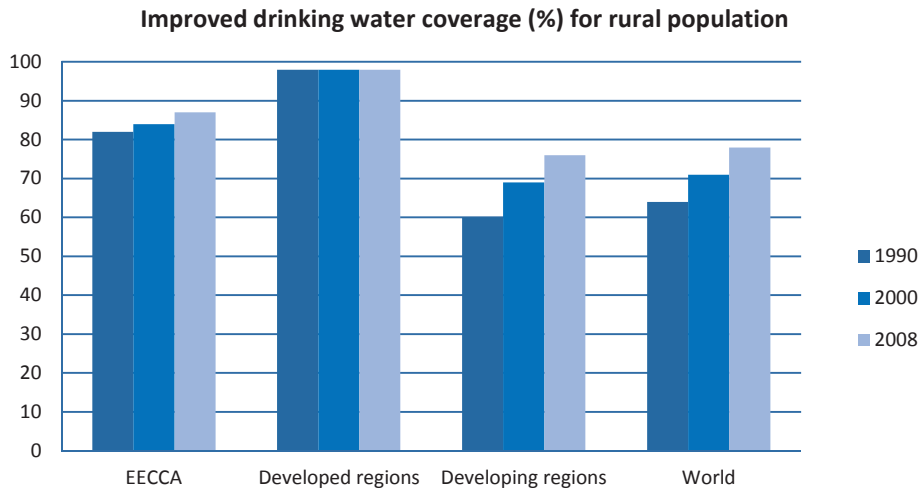
Rural areas are lagging behind in terms of access, especially in the poorest EECCA countries

Access to improved water services in rural areas is higher than in developing countries. But progress is slower. Since the early 1990s, the situation improved remarkably in three countries (Armenia, Azerbaijan, and Georgia) but deteriorated in Kazakhstan, Moldova, and Uzbekistan.

Figure 2.18. The situation in rural EECCA and compared with world regions

1990-2008





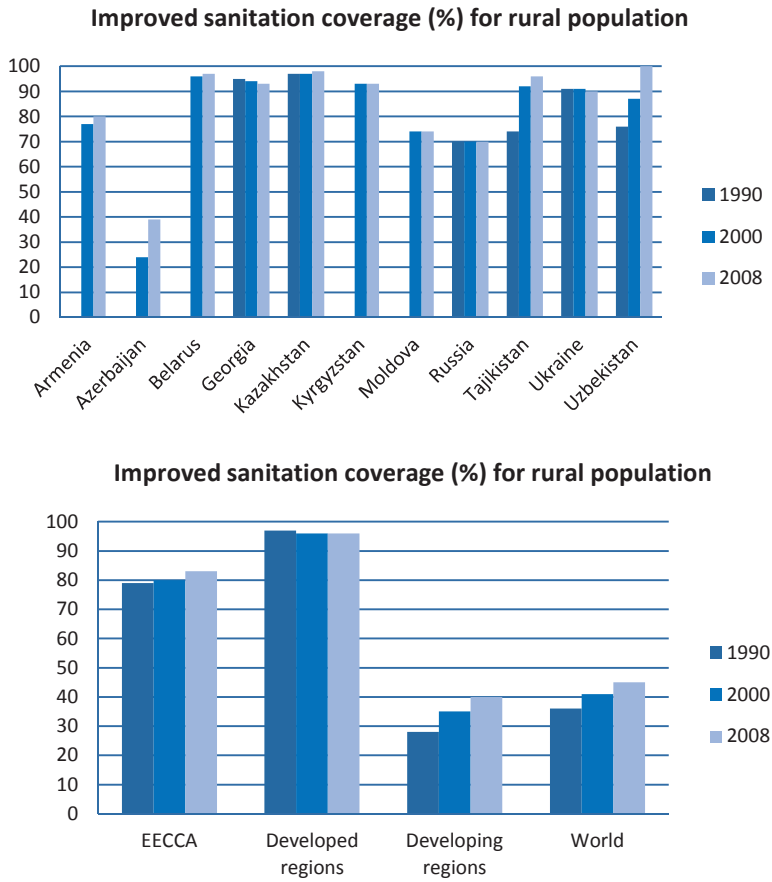
Source: JMP database, 2010.

A majority of rural settlements have to rely on low-cost groundwater sources, which generate some water quality concerns (as discussed below). Financial constraints dictate that piped water supplies cannot be provided to the majority of rural settlements. Rural dwellers rely on low-cost groundwater sources, protected streams and sometimes from surface water intakes.

Similarly, access to improved sanitation in rural areas has improved slightly over the period, although at a slower pace than in the rest of the world.

Figure 2.19. Access to improved sanitation in rural EECCA and compared with world regions

1990-2008



Source: JMP database, 2010.

Most EECCA rural settlements with less than 5000 inhabitants do not have centralised wastewater collection system. Small communities rely on low-cost methods of on-site sanitation and wastewater treatment. The most commonly used sanitation service level in rural areas is a pit latrine and, more seldom, a ventilated pit latrine. Wastewater is not treated, even in the case of simple sewerage systems. When wastewater collection and treatment systems existed previously in rural areas, they have frequently deteriorated. For example, according to the Strategy of Water Supply and Sanitation in the Republic of Moldova, almost 80% of wastewater is not treated, thus causing further deterioration of surface water quality. Of more than 560 sewage treatment facilities built in Moldovan rural settlements before the disintegration of the Soviet Union, almost none is operational anymore.

Consequences of service quality on health and the environment

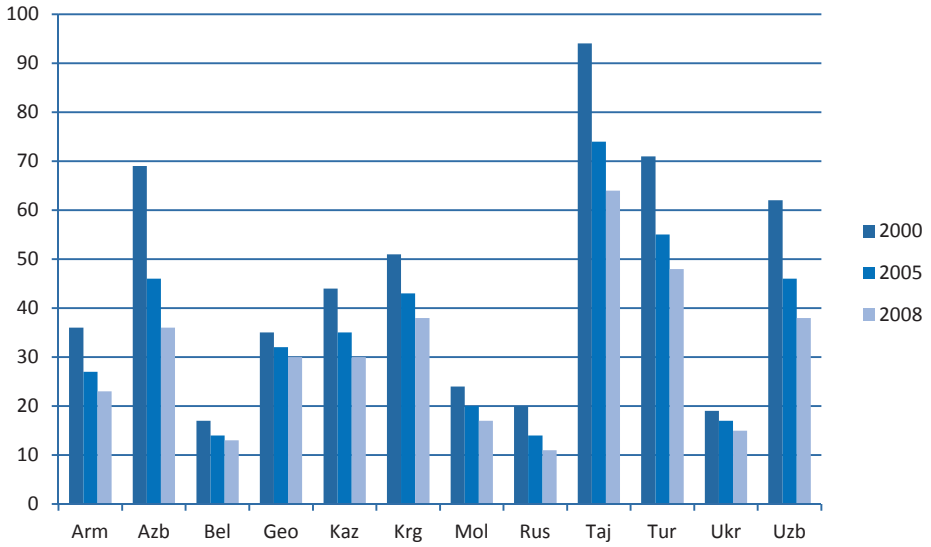
Inadequate services have a significant impact on public health

The deterioration of water quality results in levels of waterborne diseases that are significantly more frequent than in the EU. The European Environment Agency reports that most EECCA countries have problems with the quality of their drinking water supplies. The percentage of samples of drinking water not complying with microbiological standards is between five and 30%, this excess being higher in non-centralised drinking water sources, primarily in rural areas. This situation leads to significant negative health impacts, as illustrated by two charts below, based on WHO data (WHO, 2010).

Health indicators in countries where households are serviced erratically are significantly more alarming. The average mortality rate of children under five is 19 per 1000 live births (compare with 13 in WHO European region and 60 globally). In Tajikistan, although access rates have improved and average daily water supply is reported to be higher than in most countries in the region, mortality rates of children under five remains high.

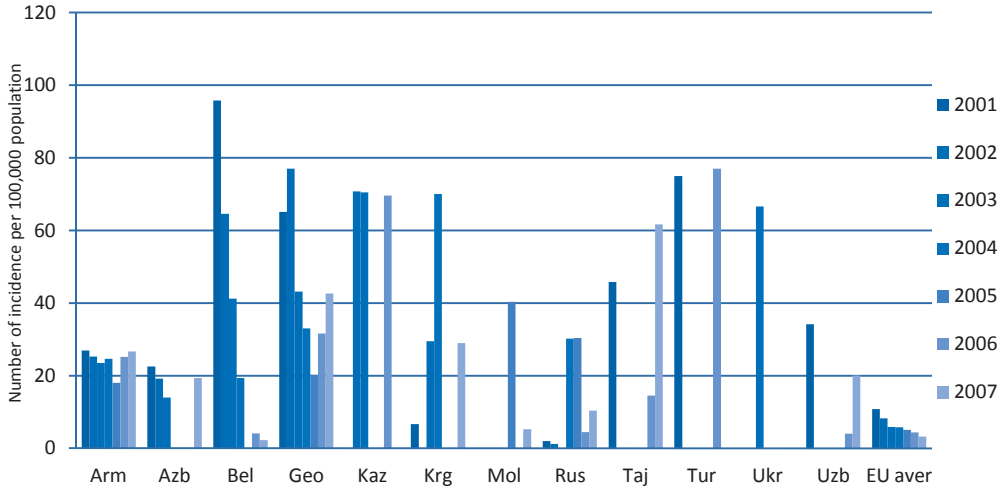
The risk of outbreaks of waterborne and food borne diseases is currently high and will increase if safe water, sanitation services and hygiene facilities (hand washing and soap) are not accessible, or deteriorate further. The main pathogens of concern are *Campylobacter, Salmonella, Shigella, Leptospira, rotavirus*, as well as other enteropathogens such as *Entamoeba histolytica* and hepatitis A. Typhoid (and paratyphoid) should be also be considered, as cases were reported in the Kyrgyz Republic in 2008 and 2009, the majority in Jalal-Abad province. Diarrhea exacerbates malnutrition, which increases the risk and severity of diarrhea. For children, malnutrition is associated with the majority of deaths from diarrhea.

Figure 2.20. Under-5 child mortality rate in EECCA (number of deaths per 1 000, 1990-2008)



Source: WHO database, 2010.

Figure 2.21. Incidence rate of Viral Hepatitis A in EECCA (per 100 000 population, 2001-07)



Source: WHO database, 2010.

In rural areas, in particular, the quality of potable water does not comply with national and WHO requirements in many rural areas of EECCA, which results in a significant public health risk. Water abstracted from ground sources is usually delivered to the distribution network without any treatment and disinfection. Groundwater quality is a concern in large parts of countries like Moldova. Adequate low-cost methods of water treatment would need to be developed and implemented in the short-term. One of the problems of the rural population in the EECCA region is the lack of sanitary inspection laboratories, which would provide continuous control of potable water quality and parameters delivered to the customers. Rural inhabitants usually have no access to reliable information on water quality. In one encouraging case, however, drinking water quality was found to be relatively high (although not 100% compliant) in Tajikistan according to a pilot monitoring initiative undertaken by WHO, as discussed in Box 2.4 below.

Box 2.4. Water quality monitoring in Tajikistan

WHO has identified an urgent need to obtain independently verifiable water-quality data, using reliable, low cost methods that ideally can be correlated with the datasets on access obtained through the household surveys and censuses. Such data could help governments make informed decisions to further improve the situation with respect to drinking-water supply in their countries. A possible method to obtain data on drinking-water quality could be a rapid, low-cost, field-based technique for assessing water quality. As a result, at a consultative meeting in Bangkok in 2002 organised by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), six countries were selected to implement pilot projects on the Rapid Assessment of Drinking-Water Quality. Tajikistan is one of the pilot countries.

In Tajikistan, four field teams visited 1620 sample sites in 53 clusters over a period of six months (from October 2004 to April 2005). The samples were taken from four broad areas (Khatlon; Rayons under direct Republican Subordination & Dushanbe; Sughd; and Gorno-Badakhshan Autonomous Oblast), and from two improved water-supply technologies (utility piped supplies and protected springs). The results of the project in Tajikistan show that the microbiological and chemical quality of water sources is generally high. Of the 1620 sites tested, 87.2% complied with the WHO guideline value and the national standard for thermotolerant coliforms, with utility piped supplies showing slightly better compliance than protected springs (88.6% versus 82.0%). The tests were conducted on water coming from the tap, as the emphasis is on testing the quality of water supplies. In addition, a limited analysis of water stored in the household was also conducted.

Source: WHO/UNICEF (2010b), "Rapid assessment of drinking-water quality in the Republic of Tajikistan: country report of the pilot project implementation in 2004-2005", WHO, Geneva.

Municipal water services represent a major source of pollution, particularly for surface waters

The level of household connection to sewerage infrastructure is relatively low compared to many OECD countries. Even when households are connected to sanitation infrastructure, the treatment of wastewater is often not assured. While little consolidated information exists about the level of equipment at primary and secondary treatment facilities (tertiary is still an exception in the region), it is clear that existing infrastructure often does not operate effectively and sometimes does not operate at all. This is mainly linked to the advanced state of deterioration of this infrastructure, as well as lack of cash for operational purposes.

As a consequence, coupled with the decline of many polluting industries in the 1990s,[5] municipal water utilities have now become the main polluters of surface waters in many EECCA countries.

The lack of adequate wastewater treatment is putting EECCA surface waters under serious environmental stress. According to the European Environment Agency (EEA), some of the major rivers in the Russian Federation and their tributaries are now highly polluted. The main water reservoirs are also highly polluted, especially the Volga cascade. In Ukraine, all river basins are classified as polluted or very polluted. Similar situations exist in most areas in EECCA that feature a high density of population and economic activity.

The EEA also reports that up to 90% of nitrogen and phosphorus discharges into the Black and Caspian Seas originate from riverine inputs, which mostly transport municipal wastewaters. Both seas are assessed as being under severe environmental stress, with significant eutrophication problems, and frequent closures of beaches on the Ukrainian and Georgian parts of the Black Sea coast due to the poor bacteriological state of the water (OECD/EAP Task Force, 2007b).

Notes

1. This is the period for which data is available in the IBNET database and can be tracked in a reliable manner.
2. The data from the graph below is from IBNET and may show a more optimistic situation as this data is for a sample of utilities whereas data in OECD, 2010b, are government statistics for the entire country
3. Non-revenue water is defined as the difference between water supplied and water sold expressed as a percentage of net water supplied; as volume of water "lost" per km of water distribution network per day; and volume of water "lost" per water connection per day.
4. See Chapter 4 for additional discussion of the sources of revenues for the sector.
5. Most industries in the former Soviet Union had a pre-treatment unit and were connected to municipal wastewater treatment plants.

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