Sustainable Business Models for Water Supply and Sanitation in Small Towns and Rural Areas in Kazakhstan

Final Report

Annual Meeting of the EAP Task Force, 7-8 October 2015, Tashkent Uzbekistan

Agenda item: 7

Earlier versions of this report were discussed by stakeholders in Kazakhstan at the national seminar on this topic on 4 November 2014, and then at the National Policy Dialogue Inter-Ministerial Coordination Council meeting on 15 May, 2015, in Astana. Both meetings generally endorsed the recommendations of this report. Feedback from local stakeholders was received and the report was revised to reflect the comments. Following discussion by the EAP Task Force the Final report will be published by the OECD.

ACTION REQUIRED: for discussion

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JT03382227

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ACKNOWLEDGEMENTS

The project was implemented as part of the National Policy Dialogue (NPD) on water policy in Kazakhstan conducted in co-operation with the European Union Water Initiative (EUWI) in Eastern Europe Caucasus and Central Asia and facilitated by the OECD and the United Nations Economic Commission for Europe (UNECE).

The contributions of participants of the EUWI National Policy Dialogue to the project and to this report is gratefully acknowledged, especially those of the Committee of Water Resources, the Committee of Architecture, Housing and Utilities, the Centre on Modernising Housing and Communal Services and the Agency of Statistics for their very productive co-operation. The Regional Environmental Centre for Central Asia (CAREC) provided input to the concluding national seminar, while the Centre for Water Initiatives provided valuable support and assistance in implementing the project.

This project was managed by Alexandre Martoussevitch of the OECD-EAP Task Force Water programme, under the guidance of Krzysztof Michalak and Xavier Leflaive. This report was drafted by a team of Polish and Kazakh project consultants, which included Marian W. Szymanowicz, Rafal Stanek, Igor Petrakov and Zhanat Alyakhassov. Mark Foss and Meleesa Naughton provided editorial support and Shukhrat Ziyaviddinov of the OECD EAP Task Force Secretariat provided logistical support to the project as well as formatting of the report.

This project benefitted from the financial support by the European Union and governments of Norway and Switzerland. The views expressed herein may not reflect the official opinion of the government of Kazakhstan, the European Union, Norway, Switzerland, or other OECD member countries.
# ABBREVIATIONS AND EECCA-SPECIFIC TERMS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>AREM</td>
<td>Agency for Regulating Natural Monopolies</td>
</tr>
<tr>
<td>BOQ</td>
<td>Bill of Quantity</td>
</tr>
<tr>
<td>CEE</td>
<td>Central and Eastern Europe</td>
</tr>
<tr>
<td>DFBOT</td>
<td>Design, finance, build, operate, transfer</td>
</tr>
<tr>
<td>EAP Task Force</td>
<td>Environmental Action Programme Task Force</td>
</tr>
<tr>
<td>EBRD</td>
<td>European Bank for Reconstruction and Development</td>
</tr>
<tr>
<td>EC</td>
<td>European Commission</td>
</tr>
<tr>
<td>EECCA</td>
<td>Eastern Europe, Caucasus and Central Asia</td>
</tr>
<tr>
<td>EUR</td>
<td>Euro (currency unit of the European monetary union)</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>EUWI</td>
<td>European Union Water Initiative</td>
</tr>
<tr>
<td>IFI</td>
<td>international financing institution</td>
</tr>
<tr>
<td>IMC</td>
<td>inter-municipal co-operation</td>
</tr>
<tr>
<td>KZT</td>
<td>tenge (currency of Kazakhstan)</td>
</tr>
<tr>
<td>lcd</td>
<td>litres per capita per day</td>
</tr>
<tr>
<td>LPA</td>
<td>local public administration</td>
</tr>
<tr>
<td>MDG</td>
<td>Millennium Development Goals</td>
</tr>
<tr>
<td>MoENV</td>
<td>Ministry of Environment</td>
</tr>
<tr>
<td>MRD</td>
<td>Ministry of Regional Development</td>
</tr>
<tr>
<td>NPD</td>
<td>National Policy Dialogue</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>O&amp;M</td>
<td>operation and maintenance</td>
</tr>
<tr>
<td>PE</td>
<td>person equivalent</td>
</tr>
</tbody>
</table>
PPP  public-private partnership
PPP  purchasing power parity
RK  the Republic of Kazakhstan
UNECE  United Nations Economic Commission for Europe
WRM  water resources management
WS  water supply
WSS  water supply & sanitation
WWT  wastewater treatment
WWTP  wastewater treatment plant

General Notes:

The model of water supply and sanitation (WSS) service delivery by a community-based organisation refers to the delivery of services by a voluntary association or co-operative of drinking water users created by the local population and/or other stakeholders.

The term Vodocanal refers to water utility functioning in the form of a publicly-owned enterprise.

Local governments refer to local public authorities and local self-governance bodies.

The term grouped water mains refers to water pipes that carry water across long distances to settlements that have no water sources of their own and have to rely on alternative and distant water sources. They are typically inter-municipal or inter-rayonal, or even inter-regional systems.

Exchange rates as of mid-Dec., 2014: 1 USD = 182 KZT; 1 UER = 226 KZT
1. EXECUTIVE SUMMARY

Kazakhstan has made significant efforts to improve the water supply and sanitation sector, but much remains to be done

Over the last 15 years, the government of the Republic of Kazakhstan has made significant efforts to improve water supply and sanitation (WSS) services. It has set ambitious targets, established a sound water tariff policy and invested significant public funds in the rehabilitation and development of relevant infrastructure. The investments were initially undertaken within the framework of the government’s Drinking Water Programme (2001-10). Further actions followed under the Ak Bulak programme, which established ambitious objectives to reduce persistent disparities between urban and rural areas for WSS coverage. Specifically, it sought to provide 80% of the rural population and 100% of small town residents with centralised water supply services by 2020.

The Ak Bulak programme provided a needed push for developing new rural water supply systems. To that end, it created new operators, replicating the municipal WSS utility model. However, many did not survive the first years of operation, leaving systems non-operational and undermining the value of public investments. That was one key reason why the significant efforts to build and rehabilitate WSS infrastructure in small towns and rural areas have not fully reached their potential.

Given this recent experience, there is an urgent need to review the business models of WSS operations to ensure their long-term sustainability, efficiency and effectiveness. Moreover, this must take place before massive new investments are made. In doing so, more attention is needed to improve access to sanitation systems in rural areas to match the progress in providing access to water.

The sustainability of WSS business models remains a key issue, as prevailing management models have limitations and often face problems

There are no available official data on the percentage of rural population served by different business models. Most experts suggest that WSS services provided by large farms and agriculture enterprises is one of the most prevalent in rural areas. Together with small private operators, this model delivers WSS services to about two-thirds of the rural population, especially in the eastern and northern regions. Small town water utilities, including a multi-services utility and rayon water utility, service most of the remaining third. Community-based organisations service only a small share of the rural population.

The review of existing business models in small towns and rural areas in Kazakhstan shows their development has been largely ad hoc rather than planned. In most cases, the currently applied models are not suited to the local geographic, hydrological, technical, financial and social conditions.

Although the WSS services provided by agriculture farms are prevalent, they have no expertise in providing services other than for their own needs; this often results in inadequate service delivery. Inadequate operation and maintenance (O&M) lead to frequent technical breakdowns and irregular water delivery. Most operate without legally valid licences and lack the appropriate technical documentation for O&M. In areas where decentralised small town water utilities provide services, the analysis shows failures to create economies of scale due to the restricted size of the service area. The Rayon Vodocanal model, recommended under the Ak Bulak programme, is implemented without adequate institutional planning and
financial analysis, thereby threatening its sustainability. In all models, the affordability of services for residents is usually not analysed, thereby failing to implement effective social policies for providing the poor with basic services.

Overall, experience suggests that a systematic approach to the institutional development of WSS service operators is crucial. The lack of sustainable WSS business models in rural areas and small towns threatens the sustainability of existing systems. In so doing, it undermines the effectiveness of the government’s interventions to bridge the gap in access between urban and rural areas, including small towns and villages. The identification and implementation of sustainable WSS business models for WSS in rural areas and small towns needs to be at the top of the WSS development policy agenda in Kazakhstan.

Lessons learned from international experience in WSS management: Consolidation vs. Delegation of WSS services delivery

Although there is no universal “first best” model for the management of WSS services, especially in small towns and rural areas, international experience provides important lessons for developing Kazakhstan’s WSS sector.

This report reviews WSS management models in selected countries of the European Union (EU) and Eastern Europe, Caucasus and Central Asia (EECCA). It analyses two main factors for determining appropriate WSS business models: the level of sector consolidation and the degree of delegation of service delivery. Regarding the applicability of the reviewed WSS business models to the small towns and rural settlements of Kazakhstan, the following observations are highlighted:

- Considering the low population density, the decentralised model is not recommended for small towns and most rural areas in Kazakhstan. It does not create the required economies of scale or address the lack of capacity of small-scale water and wastewater operators. The voluntary regionalisation of WSS services would be time-consuming and could be implemented only with the appropriate fiscal and economic incentives. Thus, the most appropriate option is mandatory regionalisation of WSS services. However, international experience shows it cannot be implemented without both state support and certain kinds of complementary business models.

- International experience shows that in case of direct provision by local authorities WSS service provision is often politicized. Many countries address this problem by creating limited liability or joint stock companies. Community-based organisations and small private operators could be considered as complementary business models. As for private sector participation, international review shows it requires a strong enabling environment (removing any administrative obstacles); however, public authorities in Kazakhstan have had so far limited experience in applying this model.

- Utilities that provide several services, such as WSS, district heating and municipal waste management in many countries, could be another alternative solution for Kazakhstan to achieve economies of scope. However, this model could only be applied in towns or rayons where other municipal services (e.g. district heating) are already in place. It would also require a solid accounting system to correctly apportion overhead costs between the services provided. The optimal approach would be to apply this model as a second step, after the regionalisation process.

- Regardless of delegation level of WSS services, the selected WSS business model must be financially sustainable (i.e. revenue from user charges should cover the costs of service provision, including O&M; possibly the renewal of infrastructure; and, ideally, extension).
Two key criteria for selecting sustainable business models: Population density and affordability

Kazakhstan has a very low population density of 6.3 persons per square kilometre (km$^2$) on average, and as low as 2.8 persons per km$^2$ in rural areas. This means that in many rural areas, population density and economic activity are not sufficient to develop economically justified and affordable centralised WSS systems. As a result, in a large part of Kazakhstan’s territory (the least populated area), WSS services are, and will continue to be, based on individual self-supply solutions. At best, small villages and communities will manage their own WSS systems.

With income for rural households lower than in urban areas, many more people live in poverty in rural than in urban areas. Consequently, the affordability of WSS services is one of the key factors determining the sustainability of WSS business models for rural areas. A local affordability analysis and willingness to pay study should therefore be conducted as part of the economic analysis of the selected WSS model to ensure its financial sustainability. Small towns and rural areas should do a micro-affordability analysis, while a macro-affordability analysis is more suitable for medium-sized and large cities.

Recommendations for Kazakhstan

Taking into account lessons learned from international experience and WSS sector development in Kazakhstan, the recommended solution is the consolidation and regionalisation of water utilities at the rayon level, through the application of the Rayon Vodocanal model. This model will help create a minimal size of the served population to benefit from economies of scale. It will also address the existing constraints related to local technical and management capacity, which is limited or absent in many rural settlements. This model will also allow a uniform tariff throughout the service area, helping small and poor villages to address affordability constraints.

The Rayon Vodocanal, acting on behalf of Rayon Administration, should also be responsible for: (a) providing back-stopping assistance to the community-based and other small-scale operators of WSS systems in the rayon (e.g. leak detection, major repairs); and (b) monitoring the provision of WSS services in the entire territory of the rayon.

Community-based management of WSS services should complement the Rayon Vodocanal model, which uses regionalisation to address the inefficient (too small) service zone size. Community-based management addresses the challenge of small distant rural WSS centralised systems that will not be served by the Rayon Vodocanal for economic reasons.

There are examples of successes and failures in community-based management of WSS services in Kazakhstan. International experience suggests, however, that this model works, provided it benefits from continuous external technical assistance. The investment in technical assistance at the local level should be viewed as a way to ensure long-term sustainability of community management of WSS services.

Many countries facing challenges similar to Kazakhstan have also successfully applied the model of private operators of small-scale WSS systems in rural areas. For example, some have extended the provision of services of private companies already on the WSS market. This model may also be a suitable option for Kazakhstan, but the legal, institutional and regulatory framework for small-scale public-private partnership (PPP) arrangements would need to be reviewed. Taking into account Kazakhstan's low population density, it would also require grouping villages, where feasible, to create more favourable conditions for private operators.
Improving the legal framework for implementing the recommended WSS business models

The Reality Check demonstrated the current legal framework already allows for the development of the Rayon Vodocanal and the community-managed WSS models. However, it also showed the existing legal framework should be reviewed and improved for the effective application of the recommended WSS business models. In particular, Rayon local authorities should be empowered to develop the Rayon Vodocanal model, while village authorities in the WSS sector should be supported to help local communities develop community-based management of WSS services. In addition, the current PPP legal framework should be reviewed to allow small-scale arrangements at village, small town and rayon levels. Currently, there is a window of opportunity to consider elaborating a dedicated law on WSS services. Such a sectoral WSS law would create a solid legal base for the development of WSS services in the entire country, and remains one of the most important objectives of the Ak Bulak programme.

The Rayon WSS Development Plan, or WSS Master Plan, is recommended as a useful tool for decision making. In addition to engineering designs for WSS infrastructure, the plan should analyse a variety of WSS business models. Among models that best suit local hydrological, engineering, financial, and social conditions, it should select ones that are feasible and affordable. It must outline the proposed WSS business models at the local level and their respective service areas in the mid- and long-term. The plan should also indicate which areas will have to rely on self-supply of WSS services; those which are or will be under community management of WSS services; and those where WSS services are or will be delivered by other institutional models, such as the rayon water utility.

The local population living in territories adjacent to the WSS service area should have the right to participate in the decision-making process. This will allow them to determine whether they would rather receive WSS services from a rayon WSS operator or from their own community management organisation (co-operative or association).

To cover WSS development across a larger area, the rayon WSS Development Plans may need to be co-ordinated with, or approved by, the respective oblast public authorities. Central and oblast governments should provide financial and technical assistance to rural rayons in developing and implementing WSS Development Plans. This includes adopting and disseminating methodological and guidance documents, as well as training officers of rayon administrations responsible for WSS.

The absence of updated data on WSS institutional development limits WSS development policies and programmes in many countries, including Kazakhstan. The monitoring and evaluation system proposed in this report would help assess progress in the WSS sector and serve as a basis for any necessary corrective measures. This is especially important as developing Rayon Vodocanals and community management of WSS services will take time, and will need to be monitored closely. Monitoring of WSS sector development at the rayon level should be aggregated at the oblast and national levels.
2. INTRODUCTION

This final report was prepared as part of the project on Sustainable Business Models for Water Supply and Sanitation in Small Towns and Rural Areas in Kazakhstan. It was implemented by the OECD EAP Task Force within the framework of the National Policy Dialogue on Water Policy in Kazakhstan in co-operation with the European Union Water Initiative (EUWI) facilitated by the OECD and UNECE. The project was financially supported by the European Union and the governments of Norway and Switzerland.

The key objective was to help Kazakh stakeholders select appropriate business model(s) for the sustainable operation, maintenance and financing of WSS systems in small towns and rural areas. This report presents the results of the analysis, as well as recommended WSS business models for rural areas in Kazakhstan, as part of the expert input into the water policy dialogue. Key findings, conclusions and recommendations of this report were presented at the national WSS seminar in Astana on 4 November 2014. Participants of the seminar recommended presenting the final report to the governmental body responsible for WSS development for consideration in improving state policy for, and elaborating programmes on, WSS development in small towns and rural areas.

The report is divided into several chapters that present the main issues linked to the current complexity and recommendations for further action. The first part provides an overview of the WSS sector in Kazakhstan, including current context and legal and institutional framework. The second part presents business WSS models prevailing in Kazakhstan, with special emphasis on small towns and rural areas. It outlines several models of WSS services provision and describes the entire range of possible service delivery options. The report ends with a general comparison of prevailing models and lessons learned from their implementation. A brief overview of business models in the WSS sector in different EU and EECCA countries is then presented, with an emphasis on lessons learned for Kazakhstan. Based on this analysis and the results of a Reality Check (see Annex VII.19), business models for water supply and sanitation in Kazakhstan are then recommended, including the Rayon Vodocanal, community-based organisations and multi-purpose utility and small-scale private operators.

The report concludes with an outline of key steps towards an action plan for recommended sustainable business models in small towns and rural areas for water supply and sanitation in Kazakhstan. A bibliography and several annexes describe in more detail the legal and institutional framework for WSS and the WSS business models identified. They also present several short case studies of WSS sector development and business models applied in selected EU and EECCA countries.
3. GENERAL INFORMATION ON WATER SUPPLY AND SANITATION IN KAZAKHSTAN

This section presents background information on the water supply and sanitation (WSS) sector in Kazakhstan, as well as the results of Phase 1 and Phase 2 of the Project on Sustainable Business Models for Water Supply and Sanitation in Small Towns and Rural Areas in Kazakhstan.

3.1. Administrative organisation and rural development programmes

Kazakhstan has a territory of 2.7 million square kilometres (km²) and a population of approximately 17.1 million people, resulting in a population density of 6.3 people per km². Kazakhstan has one of the lowest population densities in the world, close to that of the Russian Federation (8.3 people per km²). In Kazakhstan, 9,436,900 people reside in urban areas (55%), and 7,661,650 in rural areas (44%). If one takes into account the population of rural areas only, population density is much lower, with an average 2.8 persons per km². Currently, the territory of Kazakhstan is divided into 14 oblasts and 2 cities of republican subordination (Astana and Almaty), which have a status of oblast administration. The country is further divided into 175 rayons and 7,002 rural communities. At the lowest administrative level, there are 87 cities, 33 towns, and 6,869 villages. The population density varies from as low as 2.7 people per km² in Aktyubinsk Oblast to 23.2 people per km² in South Kazakhstan Oblast. Tables 1-3 below present some key information and figures on the administrative and territorial organisation of Kazakhstan, the number of residents and population density, as well as rural communities and villages by oblast.

Table 1. Territory and population of oblasts in 2013

<table>
<thead>
<tr>
<th>No</th>
<th>Oblast or city of republican subordination</th>
<th>Oblast centre</th>
<th>Territory km²</th>
<th>Population no. of people</th>
<th>Density no. of people/km²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Akmola Oblast</td>
<td>Kokchetau</td>
<td>146,219</td>
<td>735,232</td>
<td>5.03</td>
</tr>
<tr>
<td>2</td>
<td>Aktyubinsk Oblast</td>
<td>Aktobe</td>
<td>300,629</td>
<td>805,117</td>
<td>2.68</td>
</tr>
<tr>
<td>3</td>
<td>Almaty Oblast</td>
<td>Taldykorgan</td>
<td>223,911</td>
<td>1,977,324</td>
<td>8.83</td>
</tr>
<tr>
<td>4</td>
<td>Atyrau Oblast</td>
<td>Atyrau</td>
<td>118,631</td>
<td>564,936</td>
<td>4.76</td>
</tr>
<tr>
<td>5</td>
<td>East Kazakhstan Oblast</td>
<td>Ust-Kamenogorsk</td>
<td>283,226</td>
<td>1,394,382</td>
<td>4.92</td>
</tr>
<tr>
<td>6</td>
<td>Zhambyl Oblast</td>
<td>Taraz</td>
<td>144,264</td>
<td>1,081,907</td>
<td>7.50</td>
</tr>
<tr>
<td>7</td>
<td>West Kazakhstan Oblast</td>
<td>Uraisk</td>
<td>151,339</td>
<td>622,333</td>
<td>4.11</td>
</tr>
<tr>
<td>8</td>
<td>Karaganda Oblast</td>
<td>Karaganda</td>
<td>427,982</td>
<td>1,367,512</td>
<td>3.20</td>
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<tr>
<td>9</td>
<td>Kostanay Oblast</td>
<td>Kostanay</td>
<td>196,001</td>
<td>880,775</td>
<td>4.49</td>
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<tr>
<td>10</td>
<td>Kyzylorda Oblast</td>
<td>Kyzylorda</td>
<td>226,074</td>
<td>776,092</td>
<td>3.43</td>
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<tr>
<td>11</td>
<td>Mangistau Oblast</td>
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<td>165,642</td>
<td>582,361</td>
<td>3.52</td>
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<tr>
<td>12</td>
<td>Pavlodar Oblast</td>
<td>Pavlodar</td>
<td>124,755</td>
<td>752,057</td>
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<tr>
<td>13</td>
<td>North Kazakhstan Oblast</td>
<td>Petropavlovsk</td>
<td>97,993</td>
<td>526,748</td>
<td>5.89</td>
</tr>
<tr>
<td>14</td>
<td>South Kazakhstan Oblast</td>
<td>Shymkent</td>
<td>117,249</td>
<td>2,721,676</td>
<td>23.21</td>
</tr>
<tr>
<td>15</td>
<td>Astana – city of Republican subordination</td>
<td>n/a</td>
<td>710</td>
<td>804,474</td>
<td>1,133.06</td>
</tr>
<tr>
<td>16</td>
<td>Almaty – city of Republican subordination</td>
<td>n/a</td>
<td>451</td>
<td>1,494,590</td>
<td>3,313.95</td>
</tr>
</tbody>
</table>

### Table 2. Territory and population of rayons, by oblast, in 2013

<table>
<thead>
<tr>
<th>No</th>
<th>Oblast</th>
<th>Number of rayons</th>
<th>Average territory of rayon km²</th>
<th>Average population of rayon No. of residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Akmola Oblast</td>
<td>17</td>
<td>8 601</td>
<td>43 249</td>
</tr>
<tr>
<td>2</td>
<td>Aktyubinsk Oblast</td>
<td>12</td>
<td>25 052</td>
<td>67 093</td>
</tr>
<tr>
<td>3</td>
<td>Almaty Oblast</td>
<td>16</td>
<td>13 994</td>
<td>123 583</td>
</tr>
<tr>
<td>4</td>
<td>Atyrau Oblast</td>
<td>7</td>
<td>16 947</td>
<td>80 705</td>
</tr>
<tr>
<td>5</td>
<td>East Kazakhstan Oblast</td>
<td>15</td>
<td>18 882</td>
<td>92 959</td>
</tr>
<tr>
<td>6</td>
<td>Zhambyl Oblast</td>
<td>10</td>
<td>14 426</td>
<td>108 191</td>
</tr>
<tr>
<td>7</td>
<td>West Kazakhstan Oblast</td>
<td>12</td>
<td>12 612</td>
<td>51 861</td>
</tr>
<tr>
<td>8</td>
<td>Karaganda Oblast</td>
<td>9</td>
<td>47 554</td>
<td>151 946</td>
</tr>
<tr>
<td>9</td>
<td>Kostanay Oblast</td>
<td>16</td>
<td>12 250</td>
<td>55 048</td>
</tr>
<tr>
<td>10</td>
<td>Kyzylorda Oblast</td>
<td>7</td>
<td>32 288</td>
<td>105 303</td>
</tr>
<tr>
<td>11</td>
<td>Mangistau Oblast</td>
<td>4</td>
<td>41 411</td>
<td>145 590</td>
</tr>
<tr>
<td>12</td>
<td>Pavlodar Oblast</td>
<td>10</td>
<td>12 476</td>
<td>75 206</td>
</tr>
<tr>
<td>13</td>
<td>North Kazakhstan Oblast</td>
<td>13</td>
<td>7 538</td>
<td>40 519</td>
</tr>
<tr>
<td>14</td>
<td>South Kazakhstan Oblast</td>
<td>12</td>
<td>9 771</td>
<td>226 806</td>
</tr>
</tbody>
</table>


### Table 3. Rural communities and villages, by oblast, in 2013

<table>
<thead>
<tr>
<th>No</th>
<th>Oblast</th>
<th>Number of rural communities</th>
<th>Number of villages</th>
<th>Average number of villages in a rural community</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Akmola Oblast</td>
<td>236</td>
<td>712</td>
<td>3.02</td>
</tr>
<tr>
<td>2</td>
<td>Aktyubinsk Oblast</td>
<td>141</td>
<td>441</td>
<td>3.13</td>
</tr>
<tr>
<td>3</td>
<td>Almaty Oblast</td>
<td>251</td>
<td>759</td>
<td>3.02</td>
</tr>
<tr>
<td>4</td>
<td>Atyrau Oblast</td>
<td>71</td>
<td>189</td>
<td>2.66</td>
</tr>
<tr>
<td>5</td>
<td>East Kazakhstan Oblast</td>
<td>252</td>
<td>857</td>
<td>3.40</td>
</tr>
<tr>
<td>6</td>
<td>Zhambyl Oblast</td>
<td>153</td>
<td>367</td>
<td>2.40</td>
</tr>
<tr>
<td>7</td>
<td>West Kazakhstan Oblast</td>
<td>155</td>
<td>475</td>
<td>3.06</td>
</tr>
<tr>
<td>8</td>
<td>Karaganda Oblast</td>
<td>192</td>
<td>498</td>
<td>2.59</td>
</tr>
<tr>
<td>9</td>
<td>Kostanay Oblast</td>
<td>256</td>
<td>769</td>
<td>3.00</td>
</tr>
<tr>
<td>10</td>
<td>Kyzylorda Oblast</td>
<td>143</td>
<td>269</td>
<td>1.88</td>
</tr>
<tr>
<td>11</td>
<td>Mangistau Oblast</td>
<td>43</td>
<td>49</td>
<td>1.14</td>
</tr>
<tr>
<td>12</td>
<td>Pavlodar Oblast</td>
<td>169</td>
<td>505</td>
<td>2.99</td>
</tr>
<tr>
<td>13</td>
<td>North Kazakhstan Oblast</td>
<td>204</td>
<td>932</td>
<td>4.57</td>
</tr>
<tr>
<td>14</td>
<td>South Kazakhstan Oblast</td>
<td>187</td>
<td>689</td>
<td>3.68</td>
</tr>
</tbody>
</table>


### 3.2. Water resources

According to the Committee of Water Resources of the Republic of Kazakhstan, around 37 000 m³ of fresh water is available per km²; this amounts to 6 000 m³ of renewable freshwater per capita per year. In terms of renewable freshwater per capita, Kazakhstan is placed in the medium of OECD member countries, close to Greece (6 490 m³), Switzerland (6 585 m³) and Portugal (6 999 m³). There are eight river basins in Kazakhstan, out of which the largest are the Yertis, Balkhash-Alakol, Aral-Syr Darya and Caspian Sea; jointly, they account for over 70% of surface fresh water resources available (Table 4).
Renewable surface fresh water resources in Kazakhstan amount to 100.5 km$^3$ during an average year, of which only 56.5 km$^3$ is generated on the territory of the republic. The remaining 44.0 km$^3$ come from neighbouring countries: from China (18.9 km$^3$), followed by Uzbekistan (14.6 km$^3$), Kyrgyzstan (3.0 km$^3$) and the Russian Federation (7.5 km$^3$). The average water abstraction as a percentage of renewable fresh water resources in OECD member countries is about 10%, while in Kazakhstan it reaches 18.6%.

<table>
<thead>
<tr>
<th>No.</th>
<th>Water basin</th>
<th>Average long-term flow (mln m$^3$)</th>
<th>Groundwater (mln m$^3$)</th>
<th>Projected resources</th>
<th>Known and validated reserves</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aral-Syr Darya</td>
<td>14 630</td>
<td>3 360</td>
<td>17 990</td>
<td>9 290.2</td>
</tr>
<tr>
<td>2</td>
<td>Balkhash-Alakol</td>
<td>12 247</td>
<td>15 434</td>
<td>27 681</td>
<td>20 012.1</td>
</tr>
<tr>
<td>3</td>
<td>Yertis</td>
<td>7 780</td>
<td>25 920</td>
<td>33 700</td>
<td>9 563.7</td>
</tr>
<tr>
<td>4</td>
<td>Yesil</td>
<td>-</td>
<td>2 588</td>
<td>2 588</td>
<td>2 313.5</td>
</tr>
<tr>
<td>5</td>
<td>Zhayik Caspian</td>
<td>7 108</td>
<td>4 130</td>
<td>11 238</td>
<td>7 373.3</td>
</tr>
<tr>
<td>6</td>
<td>Nura-Sarysu</td>
<td>-</td>
<td>1 365.7</td>
<td>1 365.7</td>
<td>3 314.4</td>
</tr>
<tr>
<td>7</td>
<td>Tobyl-Torgay</td>
<td>292</td>
<td>1 577.6</td>
<td>1 869.6</td>
<td>3 620.5</td>
</tr>
<tr>
<td>8</td>
<td>Shu-Talas</td>
<td>2 604</td>
<td>1 640</td>
<td>4 244</td>
<td>8 791</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>44 661</td>
<td>56 015</td>
<td>100 676</td>
<td>64 278.5</td>
</tr>
</tbody>
</table>


In 2010, freshwater use amounted to 20 856 million m$^3$, 751 million m$^3$ of which was used for domestic water supply (Figure 1):

**Figure 1. Use of water by communal sector, industry, agriculture and other sectors, in 2010**

Source: Committee of Water Resources of the Ministry of Agriculture of the Republic of Kazakhstan.
abstraction of 2,901,000 m³/day in Kazakhstan for domestic water supply purposes, i.e. 17% of groundwater reserves available for exploitation.

Available groundwater resources have been used at an extremely slow pace, or their use has been suspended almost completely in a number of regions in recent years. Data presented in Figure 2 suggest that, in the northern and western oblasts, abstraction from surface water is higher than in the south, which relies on groundwater for domestic and industrial water supply. Box 1 highlights challenges related to water stress and pollution.

**Box 1. Two key challenges: Water stress and pollution of freshwater resources**

**Water stress:** In 2012, the Nura-Sarysu River Basin experienced a shortage of available, sustainable and reliable water resources of 0.1 km³ a year. In practice, this means insufficient environmental flows (the flow of water for environmental purposes that is essential for maintaining river and lake ecosystems). By 2020, due to less trans-boundary flow caused by the reduction of available resources, and due to more water consumption upstream, six out of the eight river basins of Kazakhstan will experience freshwater shortages. The deficit will keep increasing up to the 2040 horizon and could amount to 12.2 km³ a year (50% of projected net consumption). If upstream neighbouring states increase freshwater abstraction, a further 7.5 km³ of freshwater could become unavailable. The situation will be particularly critical in the Aral-Syr Darya and Zhayik Caspian Basins (with freshwater shortages in absolute terms of 4.1 km³ and 2.9 km³ per year respectively) and in the Nura-Sarysu and Tobyl-Torgay Basins, where the shortage will account for over 50% of projected water use. Due to the rapidly growing demand for water and the decline in sustainable water reserves, the water shortage is expected to reach 14 bln m³ by 2030 and 20 bln m³ by 2050 (i.e. 70% of projected demand) unless drastic action is taken. Economic losses related to water risks are estimated to amount to USD 6-7 bln a year by 2030, while the cost of transition to a water resource efficient economy remains smaller (USD 0.5-1 bln a year).

**Water pollution.** The quality of water resources is degraded by activities from the mining, metallurgical and chemical sectors, as well as municipal utility services, all of which pose a serious threat to the environment. Yertis, Nura, Syr Darya, and Ili rivers, as well as Lake Balkhash, are the most polluted water bodies. Groundwater, which is the main source of drinking water supply for the population, is also exposed to pollution. Water is polluted mostly because many regions, cities and industries fail to ensure wastewater treatment; the condition of water sources does not comply with standards; and groundwater gets dangerously polluted by numerous sewage ponds or other utility, industrial or agricultural facilities.

*Source: Kazhydromet.*
Figure 2. Water abstraction for domestic and industrial water supply in Kazakhstan in 2011

Box 2. Expected impacts of climate change

There is a consensus in academia that climate change will make Kazakhstan “drier” on average and will lead to a decrease of surface water levels. Climate change will result in increasingly uneven distribution of precipitation, frequent floods and snowstorms, larger scale of droughts, shortage of water resources available, especially in the spring and the summer, seasons. This will lead to a decline in agricultural yields as plants are expected to grow much slower, if at all, in extreme temperatures.

Winter precipitation is projected to increase on average by 8% in 2030, by 13% in 2050 and by 24% in 2086. Summer precipitation will decrease by 5% in 2030, remain constant between 2030-50 and decrease by 11% in 2085. According to experts from RGP Kazhydromet, the weather in Kazakhstan has become quite extreme: for instance, a recent heat wave, which spread over many regions and caused major harm to agriculture, was followed by heavy rains, strong winds and thunderstorms, with daily precipitation exceeding the monthly norm in some regions. Monthly average temperature anomalies amounted to 3-5 °C. The likelihood of mudslides and flooding has increased. The scale of emergency situations in the mountain water reservoirs in Almaty, Kyrgyz and East Kazakhstan Oblasts is a direct consequence of climate change.

Source: Kazhydromet.
3.3. Water supply and sanitation coverage and quality of services

As of 2012, according to the Agency of the Republic of Kazakhstan for Architecture, Housing and Utilities, 84% of the urban population had access to centralised water supply, while 75% had access to centralised sanitation systems. The information on WSS coverage and quality of services in rural areas is fragmented and not easily accessible. It is estimated that only 45% of the rural population has access to a centralised drinking water supply, and only 9% to centralised wastewater systems. In addition, 153 villages (2.2% of the total number) use water transported by water tanks as the source of drinking water supply.

The agency further reports that most water supply networks are in unsatisfactory condition. Only 36% are working, and about 64% require rehabilitation or complete replacement: most water supply networks were developed 25-40 years ago and are beyond their design lifetime. The total length of sanitation networks in the cities is 12,890 km (half of the length of the drinking water network), which shows the disparity in the development of water supply networks and sewerage systems.

From 2002-10, the number of non-operational water supply systems (those left without an operator), or totally obsolete declined from 299 to 209. During the same period, the number of systems non-compliant with sanitary and epidemiological requirements decreased from 336 to 133.

In 2012, an average of 76.4 litres of water per capita and per day (lcd) was supplied to residents. Some areas received a higher amount of water than the national average, including Pavlodar Oblast (1.7 times higher than the national average), Atyrau Oblast (1.5 times higher), Karaganda Oblast (1.6 times higher), and the cities of Almaty (1.9 times higher) and Astana (1.5 times higher). On the other hand, the lowest amounts of water consumed were in Almaty Oblast and Kyzylorda Oblast (1.8 times lower than the national average), Akmola Oblast (1.1 times lower), Zhambyl Oblast (1.7 times lower), West Kazakhstan Oblast (1.4 lower) and South Kazakhstan Oblast (1.4 times lower).

Water supply to the network amounted to 2.1 billion m$^3$, more than a quarter of which was treated at water treatment plants. Physical and commercial water losses represented on average 15-20%, with the losses in Almaty reaching 40%.

According to the National Statistics Agency, 609 wastewater treatment plants and 387 stand-alone sanitation networks were operational throughout the republic in 2012. Wastewater treatment plants have a total installed capacity of 4,137,000 m$^3$ per day and treated 678.9 mln m$^3$ of wastewater per year, i.e. 88.4% of total wastewater flow. In addition, 544.6 mln m$^3$ of wastewater, or 80.2% of total wastewater flow, received a complete biological treatment.

While water supply systems have been developing at a rapid pace, the condition of the sanitation network is poor in small towns and rural settlements.

3.4. Water tariffs and affordability

The government’s recent priorities include an effective tariff policy based on balancing the interests of consumers with those of the WSS sector, as well as improving the tariff calculation system for natural monopolies in regulated markets, like WSS. The objective is to attract investment to the WSS sector in order to modernise and upgrade infrastructure, improve the quality of services and increase competitiveness. As a consequence of implementing this policy, water tariffs were adjusted recently to reflect actual costs in the WSS sector. According to the Agency of Statistics of the Republic of Kazakhstan, on average in 2013, drinking water tariffs in the country increased by 46.2%, while tariffs for sewerage services by 43.6%; annual inflation was approximately 6.0%. See Table 5 for water tariffs in selected cities of the Republic of Kazakhstan in 2013.
Table 5. Water tariffs in selected cities of the Republic of Kazakhstan

<table>
<thead>
<tr>
<th>Name of water utility</th>
<th>User group</th>
<th>Old tariff rate (KZT/m³)</th>
<th>New tariff rate (KZT/m³)</th>
<th>Tariff increase in KZT/m³</th>
<th>in %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Effective 01 January 2013</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JSC Ak Bulak, Aktobe (pop. 427 719)</td>
<td>With IMs*</td>
<td>30.34</td>
<td>55.4</td>
<td>25</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>Without IMs</td>
<td>30.34</td>
<td>72.0</td>
<td>42</td>
<td>137</td>
</tr>
<tr>
<td>GKP Taraz Su, Taraz (pop. 351 476)</td>
<td>With IMs</td>
<td>19.36</td>
<td>22.8</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Without IMs</td>
<td>28.94</td>
<td>105.9</td>
<td>77</td>
<td>266</td>
</tr>
<tr>
<td><strong>Effective 1 February 2013</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GKP Zhetysu Su Arnasy, Taldykoran (pop. 159 037)</td>
<td></td>
<td>35.97</td>
<td>51.74</td>
<td>16</td>
<td>44</td>
</tr>
<tr>
<td>GKP Bastau, Almaty</td>
<td>With IMs</td>
<td>23.50</td>
<td>28.08</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Without IMs</td>
<td>23.50</td>
<td>62.00</td>
<td>39</td>
<td>164</td>
</tr>
<tr>
<td>TOO Batys Su Arnasy, Uralsk</td>
<td>With IMs</td>
<td>22.44</td>
<td>38.16</td>
<td>16</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Without IM</td>
<td>22.44</td>
<td>57.15</td>
<td>35</td>
<td>155</td>
</tr>
<tr>
<td><strong>Effective 1 April 2013</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GKP Kostanay Su, Kostanay (pop. 221 970)</td>
<td>With IMs</td>
<td>47.67</td>
<td>60.14</td>
<td>12</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>Without IMs</td>
<td>47.67</td>
<td>66.83</td>
<td>19</td>
<td>40</td>
</tr>
<tr>
<td>GKP Atyrau Su Arnasy, Atyrau (pop. 281 479)</td>
<td>With IMs</td>
<td>28.00</td>
<td>32.14</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Without IMs</td>
<td>32.48</td>
<td>60.14</td>
<td>28</td>
<td>85</td>
</tr>
<tr>
<td>TOO Pavlodar Vodocanal, Pavlodar (pop. 350 998)</td>
<td>With IMs</td>
<td>21.60</td>
<td>21.60</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Without IMs</td>
<td>24.62</td>
<td>31.83</td>
<td>7</td>
<td>29</td>
</tr>
</tbody>
</table>

Note: * - IM stands for “individual meter”
Source: AREM KZ: www.arem.kz.

One objective of the new water tariffs policy is to persuade consumers to reduce water consumption. This could be achieved through installation of individual water meters and the introduction of differentiated water tariffs. Table III-6 shows that water tariff rates for customers without individual water meters are higher than for customers with individual water meters. As of 1 July 2010, according to the Agency on Regulation of Natural Monopolies of the Republic of Kazakhstan, 76% of households had individual water meters (IMs); in rural areas, the figure was around 40%.

In 2013, according to the same agency, sewerage tariff rates increased in Atyrau, Kostanay and Pavlodar Oblasts. In Atyrau Oblast, sewerage tariff rates increased by 12.5% for an average rate of KZT 27 per m³ of wastewater. In Kostanay Oblast, sewerage tariff rates increased by 46% for an average rate of KZT 48.8 per m³ of wastewater. In Pavlodar Oblast, rates increased by 15% for an average rate of...
KZT 15.24 per m³ of wastewater. Lower tariff rates for sewerage services compared to drinking water underscores that sewerage infrastructure, including wastewater treatment plants, is not yet fully developed. Normally, in cases of developed sewerage infrastructure and advanced wastewater treatment technology, sewerage tariffs are higher than drinking water tariffs, reflecting higher capital and O&M costs.

**Box 3. Affordability: Macro data**

According to the Agency of Statistics, from 2001-10, the nominal gross domestic product (GDP) of the Republic of Kazakhstan nearly tripled, reaching USD 16 203/2 948 946 KZT per capita. At the same time, the average nominal income per capita per month increased by 5.3 times, amounting to KZT 40 473. From 2001, the percentage of the population with income below the poverty line was reduced by 7.2 times, and in 2010 it was at 6.5%, thereby maintaining the trend in reduced extreme poverty both for urban and rural areas. According to household surveys, the percentage of the population with incomes below the subsistence minimum in Kazakhstan in Q1 of 2013 was 3.1% (519 200 people), which is 0.8 percentage points lower than for Q1 of the previous year. In Q2 of 2013, 3.2% of the population of Kazakhstan (i.e. 541 700 people) had incomes below the minimum for subsistence, which is 0.9 percentage points in Q2 of the previous year. In rural areas, the percentage of people with incomes below the subsistence level was higher than in urban areas and amounted to 5.0% (i.e. 382 400 people) in Q1 of 2013, and 5.5% (421 800 people) in Q2 of 2013.

*Source: The Agency of Statistics.*

Table 6 shows selected macroeconomic indicators in the Republic of Kazakhstan for the period of 2001-10.

**Table 6. Selected macroeconomic indicators of the Republic of Kazakhstan in 2001-10**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal cash income of the population, monthly average per capita, KZT (estimated)</td>
<td>7 670</td>
<td>8 958</td>
<td>10 533</td>
<td>12 817</td>
<td>15 787</td>
<td>19 152</td>
<td>25 226</td>
<td>32 984</td>
<td>34 282</td>
<td>40 473</td>
</tr>
<tr>
<td>Monthly average nominal wage, KZT</td>
<td>17 303</td>
<td>20 323</td>
<td>23 128</td>
<td>28 329</td>
<td>34 060</td>
<td>40 790</td>
<td>52 479</td>
<td>60 805</td>
<td>67 333</td>
<td>77 611</td>
</tr>
<tr>
<td>Monthly average pension (at year-end)⁴, KZT</td>
<td>4 947</td>
<td>5 818</td>
<td>6 189</td>
<td>6 628</td>
<td>9 061</td>
<td>9 898</td>
<td>10 654</td>
<td>13 418</td>
<td>17 090</td>
<td>21 238</td>
</tr>
<tr>
<td>Subsistence minimum³ (average per capita), KZT</td>
<td>5 655</td>
<td>6 003</td>
<td>6 457</td>
<td>6 785</td>
<td>7 618</td>
<td>8 410</td>
<td>9 653</td>
<td>12 364</td>
<td>12 660</td>
<td>13 487</td>
</tr>
</tbody>
</table>


The census of 2009 showed a 13.8% increase in the number of households in Kazakhstan, compared to 1999. While the number of urban and rural households increased by 13.4% and 30.3% respectively. The average household size decreased in both urban and rural areas: according to the 2009 census, the average household size was 3.5 persons. Households consisting of two people accounted for 30.1% of total; of three people, 26.7%; of four people, 22.2%; of five people, 11.7%; of six people 5.6%; and of seven people and more, 2.1%.

A critical factor for the sustainability of WSS service delivery is the balance between full cost recovery from water tariffs and its affordability for the population. Taking into account the statistical information presented above, although water tariffs were significantly increased recently, they are still within the range of affordability in urban areas. In rural areas water tariffs are higher, while the financial situation of households is worse than in urban areas; hence, affordability constraints are greater.
The OECD conducted one of the most extensive studies on water affordability worldwide (OECD 2003). The study distinguishes between macro-affordability (average national water expenditure divided by average household income) and micro-affordability (which includes estimates differentiated by income group, family type and geographic region). It confirms the importance of analysing different income groups. In Kazakhstan, and in EECCA in general, as a household grows its per capita income declines, and the share of water charges in household expenditures grows.

The macro-affordability analysis in Kazakhstan shows that current water tariffs, even after the recent tariff increases, are still within the affordability criteria (i.e. expenses for WSS are less than 4% of household disposable income); however, the situation in small towns and rural areas is most likely different because i) average household disposable income is much lower than in medium-sized and large cities; ii) household size is much larger (six to eight people on average); and iii) water tariffs are higher. Although households in rural areas consume less water (in lcd) than in urban areas, this does not compensate for the differences in the level of water tariffs and household incomes. As a result, people in some rural areas refuse to use the centralised water supply because they cannot afford it. In the opinion of experts, affordability analyses should be part of feasibility studies undertaken locally, at the level of the rayon. In the example of micro-affordability analysis in Box 4, high water tariffs may be well above the affordability threshold for low-income households in rural areas.

**Box 4. Example of affordability analysis**

- Family size: option minimum (FS-Min) - six people, and option maximum (FS-Max) - eight people
- Household income: option minimum (HI-Min) – KZT 63,668.5/month, option average (HI-Aver) – KZT 135,329.13/month
- Water tariff: option minimum (WT-Min) – KZT 40/1m$^3$, option maximum (WT-Max) – KZT 150/1m$^3$
- Water consumption: option minimum (WC-Min) – 50 lcd, option maximum (WC-Max) – 150 lcd.

Table 7 provides a calculation of affordability for the above scenarios.
Table 7. Affordability of water tariffs based on different scenarios

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Average bill [KZT/month]</th>
<th>WSS expenses as percentage of household income</th>
</tr>
</thead>
<tbody>
<tr>
<td>FS-Min, HI-Min, WT-Min, WC-Min</td>
<td>403.2</td>
<td>0.6</td>
</tr>
<tr>
<td>FS-Min, HI-Min, WT-Min, WC-Max</td>
<td>1 209.6</td>
<td>1.9</td>
</tr>
<tr>
<td>FS-Min, HI-Min, WT-Max, WC-Min</td>
<td>1 512.0</td>
<td>2.4</td>
</tr>
<tr>
<td><strong>FS-Min, HI-Min, WT-Max, WC-Max</strong></td>
<td><strong>4 536.0</strong></td>
<td><strong>7.1</strong></td>
</tr>
<tr>
<td>FS-Min, HI-Min, WT-Max, WC-Max</td>
<td>6 048.0</td>
<td>9.5</td>
</tr>
<tr>
<td>FS-Min, HI-Aver, WT-Min, WC-Min</td>
<td>403.2</td>
<td>0.3</td>
</tr>
<tr>
<td>FS-Min, HI-Aver, WT-Min, WC-Max</td>
<td>1 209.6</td>
<td>0.9</td>
</tr>
<tr>
<td>FS-Min, HI-Min, WT-Max, WC-Min</td>
<td>1 512.0</td>
<td>1.1</td>
</tr>
<tr>
<td>FS-Min, HI-Aver, WT-Max, WC-Max</td>
<td>4 536.0</td>
<td>3.4</td>
</tr>
<tr>
<td>FS-Max, HI-Min, WT-Max, WC-Max</td>
<td>6 048.0</td>
<td>4.5</td>
</tr>
</tbody>
</table>

Source: Authors’ own calculations.

For low-income families, only the minimum tariff of KZT 40/m³ is affordable for the highest volume of water consumption (which is the average water consumption in Kazakhstan) or a higher tariff with the minimum consumption of 50 lcd. Higher rates of water consumption exceed the level of affordability of water (lines in bold). This example of affordability calculation illustrates that, in the case of small towns and rural areas, the affordability analysis should be done locally to analyse specific local conditions.

3.5. Programmes for the development of the water supply and sanitation sector

In 2002, recognising WSS development as a priority, the government of the Republic of Kazakhstan adopted a Drinking Water Programme for the period of 2002-10 (Decree No. 93 of 23 January 2002). The main objective was to increase access to adequate quality/safe drinking water by extending the number of connections to centralised water supply systems. The Ministry of Agriculture co-ordinated the programme, which was implemented in two phases (2002-05 and 2006-10). Financing (around KZT 194.9 bn, i.e. 65% of planned funds) was allocated from the state budget, with the remainder coming from local budgets and the private sector. As a result, 13 288 km of water lines were reconstructed and repaired, and water supply systems were improved in 3 449 rural settlements, including 32 small towns. Altogether, about 50 000 people received access to quality drinking water, including 35 000 people in rural areas (0.2% of the total population of Kazakhstan). Despite this progress, the programme did not reach all planned indicators, which led to the creation of another WSS programme (Box 5).

**Box 5. The Ak Bulak programme**

On 24 May 2011, the government of the Republic of Kazakhstan adopted the Ak Bulak Programme for 2011-20 to provide the population with quality drinking water and sanitation services. By 2020, 100% of the urban population and 80% of the rural population are expected to have access to centralised drinking water. At the same time, 100% of the urban population and 20% of the rural population will have access to sewerage systems. The programme objectives are the following:

- Introduce a systematic approach for the construction and/or rehabilitation of water and sanitation infrastructure.
- Construct and rehabilitate centralised water supply and sanitation systems in urban areas.
- Construct and rehabilitate centralised water supply and local sanitation systems (septic tanks) in rural areas.
- Improve the legal regulatory framework in the field of water supply and sanitation.
- Ensure the efficiency and financial sustainability of water and wastewater operations.
- Increase investment attractiveness of the water sector and maximise involvement of private capital in the financing of water and sanitation projects.
  - Maximise the potential of using groundwater for drinking water supply.
  - Improve the design of water and wastewater infrastructure.
  - Create a system for monitoring water and sanitation sector.
  - Create a system for monitoring groundwater and surface water quality.
- Ensure that water tariffs are sufficient for the sustainable operation of water management organisations, making sure that long-term and cost-effective tariffs guarantee a return on investment.
- Reduce non-revenue water during transport to the consumer to a technically appropriate level.
- Develop local content in designing water and sanitation projects.

For 2011-20, the Ak Bulak Programme was projected to cost KZT 1 273.8 bn (KZT 1 164.1 bn from the central budget and KZT 109.7 bn from local budgets).

Source: Ak Bulak Programme.

Data on the current status of WSS services in rural areas show that significant progress is necessary to reach the Ak Bulak objectives. Success requires not only mobilisation of financial and human resources, but also the development of WSS projects ready for implementation. The recent shortage of new WSS projects is caused by the following factors:

- delay in exploration and confirmation of groundwater resources

In 2012, the Ministry of Industry and New Technologies launched the exploration of groundwater resources for 341 villages, which was completed in late 2013. As a result, the programme has been adjusted, and target indicators reduced, thus increasing the scope of work in the second phase. In 2013, groundwater exploration began for only 216 of 480 planned villages. This caused further delays in implementation and jeopardises the realisation of the Ak Bulak objectives in general.

- delay in construction and rehabilitation of grouped water mains

In light of the various delays, and in order to improve implementation, the following recommendations were made by experts:
  - Implementation should first focus on providing access to centralised drinking water systems in large populated areas.
The use of local water resources should be prioritised, and standard engineering designs for areas with small populations should be developed and disseminated.

Groundwater exploration and validation should be assigned to local authorities.

- Insufficient allocation of funds by local authorities for the design of WSS systems and the Bill of Quantities (BOQ) estimates.

An analysis of the Drinking Water and Ak Bulak programmes shows that many newly-constructed WSS systems do not function adequately due to the absence of unified technical standards and the use of poor quality materials. To improve quality of design and construction, the Ministry adopted a special procedure for the development, co-ordination and approval of engineering documentation for the construction of WSS infrastructure. It will help regulate the quality of materials, equipment and technologies at all stages, from design to construction and commissioning.

Another acute problem is unsustainability, or the lack, of operators of newly built or rehabilitated WSS systems in rural settlements.

A single (national) operator to manage drinking water and sanitation services in rural areas was proposed to solve such complex problems as poor planning, design and construction, as well as the lack, or unsustainability, of organisations in charge of operation and maintenance. It was assumed this strategy would provide i) a more efficient, centralised management of WSS in rural areas; and ii) a uniform approach to planning, designing, constructing and operating the WSS infrastructure that would accommodate future forms of PPP.

Recognising the importance of private sector participation, the government adopted on 29 June 2011, Resolution No.731: On the Approval of the Development of Public-Private Partnerships (PPPs) in the Republic of Kazakhstan for 2011-15. In 2011, the Ministry of Agriculture developed a procedure for introducing PPPs in the construction of drinking water facilities in rural areas. The aim was threefold: increase effectiveness and efficiency of WSS operations; reduce the burden on the national and local budgets; and increase access to drinking water and sanitation services in urban and rural areas. The main prerequisite for increasing investments from the private sector is the profitability of WSS services, which should guarantee a return on investments. The policy is contingent upon finding the right balance between sustainable cost recovery and affordability of water tariffs. The Agency on Architecture, Housing and Utilities with the support of the European Bank for Reconstruction and Development (EBRD) has already developed a pilot project to attract private investment to WSS in the cities of Semey, Taraz and Atyrau.
4. PREVAILING BUSINESS MODELS FOR WATER SUPPLY AND SANITATION IN SMALL TOWNS AND RURAL AREAS IN KAZAKHSTAN

This section discusses existing WSS business models in small towns and rural areas in Kazakhstan. As official data on the legal and institutional organisation of WSS operators were not available, the information presented here is based on the knowledge and experience of local project experts. Although very extensive, this analysis does not reflect a detailed study of concrete situations in all rural areas. Instead, it highlights the strengths and shortcomings of the current situation as a basis for improving programmes, as well as providing a baseline for monitoring and evaluation systems to measure progress. The existing WSS business models in small towns and rural areas in Kazakhstan are the following:

- a large farm or an agricultural enterprise
- a small town water utility
- a multi-services utility
- a rayon water utility
- grouped water mains as a source of water
- an individual private operator under a service contract or lease or concession agreement (public-private partnership model)
- a community-based organisation (e.g. rural consumer co-operatives).

According to national experts, large farm or individual private operators that provide WSS services are the main model of service delivery in many small towns and villages (representing about 61% of the total rural population). Small town water utilities, including multi-services utility and rayon water utility, service around 33% of the rural population. Community-based organisations serve only 6% of the rural population.

4.1. WSS service delivery model: Large farm or agricultural enterprise

Usually, large farms or agricultural enterprises rely on their own WSS systems and have their own operation and maintenance personnel. In the case of more complex operations, they contract out engineering services to private companies. The farms usually provide drinking water for their own needs and for the household needs of their employees free of charge. If they are selling water to other consumers, they may charge a water tariff approved by the Agency of Regulating Natural Monopolies (AREM).

There are no available official data on the percentage of rural population served by the model of large farm and agriculture enterprises. According to national experts, however, this model is one of the most prevalent in rural areas. Together with small private operators, it delivers WSS services to about half of the rural population, especially in the eastern and northern regions. Local authorities support this model because it does not require any allocation of public funds from local budgets. Consequently, local authorities often turn to the farms and to agricultural enterprises with requests to operate existing public
WSS infrastructure. But since farmers and agricultural enterprises have no expertise in delivering WSS services other than for their own needs, this often results in inadequate water supply and sanitation service delivery. Inadequate operation and maintenance leads to frequent technical failures and breakdowns, and irregular water delivery. Besides technical problems, there are also legal issues associated with this model; local authorities usually do not provide big farms and agricultural companies with appropriate legal and technical documentation to operate and maintain WSS infrastructure. In principle, these suppliers should have a lease or concession contract with local authorities. In practice, these arrangements are rare as the legal framework for small-scale private-public partnerships (PPPs) is not fully developed.

4.2. WSS service delivery model: Small town water utility

Small town water utilities are generally established by the local authorities of rayons and, sometimes, of oblasts. Water utilities can be established as state-run enterprises or commercial companies (limited liability companies or joint stock companies). Local authorities generally own commercial companies, although there are some examples of mixed public and private ownership more common in mid-sized and large cities. Usually, the water utility provides both drinking water and sanitation services. In rare cases, it provides a so-called multi-service communal enterprise/utility (see section IV.6). The WSS services are financed by the customers’ payments of water tariffs. Because small towns often do not have enough customers to finance the full cost of WSS services, water utilities in search of additional customers might consider extending their WSS infrastructure to surrounding settlements. This option is fully in line with the regionalisation policy and can provide many benefits, both for the water utility and for consumers in the surrounding settlements (see Box 6).

Box 6. Water utility in the town of Talgar expands its service area to surrounding settlements

The town of Talgar (pop. 45 529) is located in Talgar Rayon (pop. 156 940, area 3 700 km², density 42.41 people/km²) in Almaty Oblast. The rayon authorities established a state communal enterprise Vodocanal, which delivered WSS services in Talgar. Recently, rayon authorities have been working on re-registering the Vodocanal under the new name of Su Kubyry, with a new service area, extending services to settlements near Talgar. The sustainability of this model depends on achieving a balance between the principle of full cost recovery from water tariffs and their affordability for the population.

Source: Own assessment based on information from rayon administration.

Given the low population density in Kazakhstan, the small town water utility model is not a solution for all rural areas. Small towns often do not provide sufficient population density and economic activity for viable centralised (piped) WSS; such systems often struggle with low financial sustainability, as well as lack of technical capacity.

4.3. WSS service delivery model: Rayon water utility

According to national experts, rayon water utilities service about 15% of the rural population. The Ak Bulak programme, which promotes this model of WSS service delivery, assumes that each rayon in the country will form a water utility. Although this model looks promising, each rayon will require a feasibility assessment, especially considering the country’s low population density. The model can only operate where full cost recovery from water tariffs is balanced with affordability for the local population. Additional studies for specific rayons should determine the economic feasibility of the current and future service area of a rayon water utility. Areas outside the service area will need to be served by other models.
A rayon water utility often owns several separate centralised WSS systems. In such cases, water tariffs are individually calculated for each centralised WSS system; overhead costs are apportioned between the services through a specific cost-sharing formula. Another option is to have a single tariff for the entire service area; in this case, tariffs collected from the urban population are used to cross-subsidise WSS services for the rural population (Box 7).

**Box 7. Rayon water utility in the village of Chundzha, Uygur Rayon, Almaty Oblast**

Uygur Rayon (pop. 64 762, area 8 700 km², density 7.44 people/km²) includes 14 rural districts and 25 small towns. The rayon water utility, a state communal enterprise called Uygyr Su Kubyry, was created by the authorities of Uygur Rayon to provide WSS services. It serves seven villages, or about 48% of the rayon population (31 085 people):

- Chundzha, pop. 18 500, length of WSS network 73.6 km
- Bakhar, pop. 1 500, length of WSS network 9.1 km
- Taskarasu, pop. 3 200, length of WSS network 15.5 km
- Sunkar, pop. 1 800, length of WSS network 12.5 km
- Ketmen, pop. 2 600, length of WSS network 20.6 km
- Tigermen, pop. 2 600, length of WSS network 18.3 km
- Shirin, pop. 1 200, length of WSS network 6.5 km.

After implementation of the Ak Bulak Programme, the number of settlements covered by the utility will increase. The rayon water utility owns the WSS network; the Department of the Agency for Regulation of Natural Monopolies of Almaty Oblast approves water tariffs. The rates depend on the water source and range from an average of KZT 30 to KZT 43 per m³; water consumption ranges from 50 to 180lcd. Local employees of the rayon utility operate the local WSS networks; their number ranges between three to five people in each settlement, depending on the length of the network. The sustainability of this interesting model of WSS service delivery depends on achieving a balance between full cost recovery from water tariffs and affordability for the local population.

*Source:* Interviews with managers of Uygyr Su Kubyry Regional WSS utility.

### 4.4. WSS service delivery model: Grouped water mains

Areas with no water sources of their own have to rely on piped water delivered from distant water sources by grouped water mains. This model is operated by the Republican State Enterprise (RSE) Kazvodhoz, which in 2014 was subordinated to the Committee of Water Resources under the Ministry of Environment and Water Resources. RSE Kazvodhoz has local branches in each oblast and in the two major cities of Astana and Almaty, as well as specialised and “thematic” branches (Aral, Yesil Su, Ontustikauyzsu and Su Metrology).

These local branches own the grouped water mains. The list of grouped water mains, approved by the government in Resolution No 1265 of 13 December 2003, comprises 304 objects, including 45 grouped systems. Resolution No 248 of 5 April 2006 approved rules for subsidising the cost of drinking water from the grouped water mains, where those are the only source of drinking water.
The local branches of RSE Kazvodhoz operate and maintain grouped water mains, and deliver water to local WSS systems. An agreement stipulates the rights and obligations of each party; it designates the location where the responsibility of RSE Kazvodhoz ends and the responsibility of local WSS operators starts.

4.5. WSS service delivery model: Multi-service utility

In searching for a way to provide sustainable WSS services, local authorities have also considered multi-service utilities, as well as the regionalisation of WSS services. In Kazakhstan, there are 59 urban settlements with populations below 50,000 residents; those are formally called small towns. Forty-one of those (i.e. 68% of small towns) are administrative centres of their respective rayons. The total population of small towns is more than 1.5 mln people, or 8.8% of the total population of Kazakhstan. In terms of population size, 13 small towns have fewer than 10,000 residents. At the same time, as the size of population is not the only criterion for assigning the status of “town”, many rural settlements in Kazakhstan with populations ranging between 10,000 to 20,000 people do not fall under the small town category.

The model of WSS delivery by multi-service utility is often found in small towns, where population density and economic activity is low. One of the solutions for decreasing unit costs of WSS service delivery is to share overhead costs between different utility services. WSS services, district heating (DH) services and other communal services, for example, can pool management, administrative and financial functions. Typically, multi-service utilities provide the following services:

- thermal energy generation, transfer and distribution, O&M, and capital repairs of enterprises’ and institutions’ heating networks
- water supply and sanitation services, O&M and capital repairs of enterprises’ and institutions’ water supply and sanitation networks
- bulk purchase of electricity, its transportation, distribution and sale to end-users through transformer sub-stations, high-voltage and low-voltage distribution networks, O&M capital repairs of enterprises’ and institutions’ electric networks
- bulk purchase of natural gas, O&M and capital repairs of gas pipelines and gas distribution points
- municipal waste management
- O&M and capital repairs of control and measuring devices, installation of utility meters for users
- service provision by motor vehicles and devices.

Small town multi-service utilities typically function as state-owned utilities or limited liability companies. Groundwater and surface water (from rivers with natural or regulated flow, as well as from water reservoirs) are used as sources of water supply. Many towns have no centralised sanitation systems; existing wastewater treatment plants are either non-existent, used well below their design capacity and/or fail to perform up to established requirements/treatment standards.
4.6. WSS service delivery by individual private operator under a service contract, lease or concession contracts (PPP model)

According to Article 27 of the Water Code, the WSS infrastructure can be subject to free use, trust management or lease by a private entity, with the exception of strategically important objects if it is communal property and owned by a state communal enterprise. Based on this, rayon authorities may choose not to establish their own water utilities, but rather sign an agreement with a private operator to operate and maintain WSS infrastructure and deliver WSS services. The agreement should be made through a public tender that selects the bid offering the best value. According to the Agency of Statistics of the Republic of Kazakhstan, only eight lease and concession contracts have been signed in rural areas. According to national experts, the lack of experience in applying lease and concession contracts in small WSS supply systems is one factor influencing the small uptake of such models in rural areas in Kazakhstan. Other factors are the lack of WSS infrastructure and its poor condition, which may not seem attractive enough to the private sector, as well as small consumer base in rural areas. In this situation, development of this model will require a solid legal base and consolidations of small local markets in bigger ones that are more attractive for the private sector.

4.7. WSS service delivery model: Community-based organisation

According to national experts, only about 6% of the rural population is served by this model in Kazakhstan. Experts believe that establishing water user co-operatives requires mobilisation of the local community, which is not easy and not popular with local authorities. There are still some expectations that WSS services should be organised by public authorities, not by communities themselves. Although not very popular in Kazakhstan, the community management model is very important for ensuring WSS services in many rural areas. This is especially true in areas with low population density and lower levels of economic activity, which do not allow the development of other forms of organisation. International experience shows this model requires significant efforts to develop community capacity along with an effective system of external backup assistance to ensure long-term sustainability.

In Kazakhstan, the model of community management of WSS services takes the form of rural consumer co-operatives. According to the law, a rural consumer co-operative is a voluntary association of citizens on the basis of membership established by combining property and financial contributions. Members of the rural water user co-operative may be both physical persons and legal entities. Local authorities have no right to interfere in the economic, financial and other activities of rural consumer co-operatives. Figure 3 presents the procedure for forming a rural water user co-operative.

![Figure 3. Process of forming a rural water user co-operative](source: Authors’ own)
Figure 4 presents the overall management structure of a rural water user co-operative.

**Figure 4. Management structure of a rural water user co-operative**

A rural water user co-operative establishes its own services for the operation and maintenance of WSS infrastructure. In the case of a small rural settlement, it usually consists of one technician only; a larger system may have a few technicians. In the case of a complex system, a rural water user co-operative may choose to contract out operations and maintenance to an external private company (outsourcing). **The law allows for creating a rural water user co-operative not only for one rural settlement, but also for two or more settlements.** In this case, one co-operative delivers WSS services to several rural settlements. Under this model, all expenses are financed by contributions of water users; tariffs or monthly fees cover the cost of operation and maintenance of respective WSS systems. Box 8 illustrates two examples of projects on developing community management of WSS service delivery in rural settlements in Kazakhstan.

**Box 8. Project implemented by UNDP and the Coca-Cola company in Almaty Oblast, Karasay Rayon**

The objective of the project was to rehabilitate WSS infrastructure in the village of Kok Ozek to ensure the delivery of WSS services to the population of the village (2,500 people). The project stakeholders were the following:

- the local authorities of Karasay Rayon and the village of Kok Ozek, responsible for developing technical designs and cost estimation documents
- the Coca-Cola Company, responsible for financing the rehabilitation of the water well and the construction of main water pipes in the streets of the village
- the population of the village of Kok Ozek, which contributed in kind to the project, through labour and construction work by connecting their homes to the main water pipes in the streets
- the UNDP, responsible for the funding of community mobilisation activities and establishing and registering the water user co-operative.

The established rural water user cooperative includes the following bodies:

- the general assembly, which is the highest governing body of the co-operative
• the board, which is the executive body of the co-operative
• the audit commission, which is the supervisory body of the co-operative
• the O&M Service, responsible for O&M and repair of WSS infrastructure
• the accounting department, responsible for financial management of the co-operative.

The co-operative employs one person to operate and maintain WSS infrastructure. It provides only drinking water services because there is no sewerage system in the village; each household has a septic tank. Although this could be considered an example of a successful rural water user co-operative, one challenge remains: the constructed WSS infrastructure assets, which were handed over to the co-operative, are not officially registered with the co-operative, and there are no detailed technical documents for the infrastructure. This is linked to the significant costs of developing technical documentation. Another issue is that sustainability of the co-operative requires continuous external support and assistance.

Source: Own assessment based on information provided by the UNDP.

Box 9 illustrates an example of another project, implemented between 2003-10.

Box 9. The Clean Water for Rural Communities in Kazakhstan project implemented by the Regional Environmental Centre for Central Asia in Almaty Oblast

The Clean Water for Rural Communities in Kazakhstan project was financed by the European Commission, the governments of Norway and the United States, and the Ministry of Foreign Affairs of Germany through GIZ. The project was implemented by the Regional Environmental Centre for Central Asia in 2003-10. The first phase took place in Almaty Oblast; subsequent phases entail scaling up the project, first in the territory of Kazakhstan and then in other Central Asian countries. The project began in rural settlements with populations under 1,000 people that were not included in the State Drinking Water Programme. In Almaty Oblast, the following villages were selected:

- Algabas
- Tenlik
- “1st of May”
- Kopberlik
- Beskaynar
- Konyr
- “10 years of Kazakhstan”
- Kyzyltogan
- Enbekshikazah
- Mukri
- Keneral
- Maulenbay.

One of the main objectives was to achieve sustainability of WSS operations and maintenance, while ensuring the quality of WSS services to the population. This was supposed to be achieved through mobilisation of the local population and creation of rural water user co-operatives, in partnership with local authorities. It was assumed the local population would contribute financially to operations and maintenance of WSS infrastructure via water tariffs consistent with the cost recovery principle. Furthermore, the project assumed that stakeholders would finance the total cost of rehabilitation and construction work as follows:

- 70% from donors
• 20% from local authorities
• 10% from the population of beneficiary villages.

Simultaneously, the project worked on establishing and building the capacity of rural water co-operatives, which were benefiting from the constructed infrastructure. In 2009-10, the Regional Environmental Centre for Central Asia (CAREC) in co-operation with the Committee on Water Resources of the Ministry of Agriculture and the rayon Akimats implemented the second phase of the project. The second phase sought primarily to showcase the experience of the first phase and to scale it up for the whole territory of Kazakhstan. It organised 14 regional and national conferences to share the experience of solving the drinking water problem in Almaty Oblast. The project did not find much support among local authorities from other oblasts because creating a rural water user co-operative requires significant efforts and costs. In this regard, the objectives of the second phase of the project were not achieved.

Source: Own assessment based on information from CAREC.

4.8. Prevailing WSS business models: Lessons learned for Kazakhstan

Sustainable access to safe drinking water and appropriate sanitation are among the key objectives of the Millennium Development Goals (MDGs) and a key pillar of Kazakhstan’s transition to a green economy. In this regard, Kazakhstan has undertaken significant measures to develop WSS services in the entire country. Within the framework of the Drinking Water Programme and now Ak Bulak Programme, significant public funds have been allocated for construction and rehabilitation of WSS infrastructure. In addition, regional and rural development initiatives have accompanied WSS development initiatives aimed at improving living conditions, especially in rural areas. A water tariff policy to improve the effectiveness and efficiency of the WSS sector has recently enhanced investments. However, much remains to be done to ensure sustainable WSS service delivery, especially in small towns and rural areas.

The review of the prevailing WSS business models in Kazakhstan highlights the lack of a systematic approach to institutional development of WSS in small towns and rural areas. Together with the low population density and economic activity in small towns and rural areas, the business models result in weak institutional structures and low sustainability of WSS service delivery. These need to be addressed as part of the WSS development programme.

Lessons learned from Kazakhstan and other countries (see Annexes VII.1-19) suggest it is insufficient simply to rehabilitate or build new infrastructure to improve the quality of WSS services. It is also necessary to develop organisational, managerial, technical and financial capacity to ensure sustainable operations, maintenance and financing of WSS systems. This is especially important in the development and rehabilitation of WSS infrastructure in small towns and rural areas, where the issue of sustainable business models for proper operations, maintenance and financing of the newly developed WSS infrastructure requires special attention.

Table 8 provides a summary of benefits and drawbacks of prevailing WSS business models in Kazakhstan, as well as possible improvements for building long-term sustainability.
Table 8. The main benefits and drawbacks of the prevailing business models in small towns and rural areas in Kazakhstan

<table>
<thead>
<tr>
<th>Prevailing WSS business model</th>
<th>Benefits</th>
<th>Drawbacks</th>
<th>Possible improvements of existing business model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model of a large farm or agricultural enterprise</td>
<td>Possibility of using WSS infrastructure of large farms for supplying WSS services to surrounding households</td>
<td>Lack of necessary human capacity for provision of WSS services to the entire rural community</td>
<td>Only applicable for self-supply of WSS services for the own needs of large farms</td>
</tr>
<tr>
<td>Model of WSS service delivery by a community-based organisation</td>
<td>Delivering of WSS services by the community itself</td>
<td>Lack of necessary human capacity for delivering WSS services; need for continuous external assistance</td>
<td>Providing external assistance and specialised services</td>
</tr>
<tr>
<td>Model of WSS service delivery by a small town water utility</td>
<td>Providing quality WSS services to the population of a small town</td>
<td>Revenue from the small client base is not sufficient to cover all costs in service delivery and extension</td>
<td>Regionalisation</td>
</tr>
<tr>
<td>Model of WSS service delivery by a rayon water utility</td>
<td>Providing quality WSS services to urban territories within rayon</td>
<td>Requiring time and investments in building the needed structures</td>
<td>Incorporation of companies/utilities</td>
</tr>
<tr>
<td>Model of grouped water mains</td>
<td>Providing a source of water for communities without their own sources</td>
<td>Large investments and higher cost of water</td>
<td>Subsidising costs of water transportation</td>
</tr>
<tr>
<td>Model of multi-service utility (WSS and district heating [DH])</td>
<td>Sharing a pool of technicians and overhead costs between services</td>
<td>Unintended cross-subsidisation</td>
<td>Regionalisation</td>
</tr>
<tr>
<td>Model of WSS service delivery under a service contract, lease or concession contracts (PPP model)</td>
<td>Using private know-how for delivering WSS services</td>
<td>Lack of experience and conducive regulatory framework</td>
<td>Building experience in PPP arrangements based on a more conducive legal, institutional and regulatory framework</td>
</tr>
</tbody>
</table>

Source: Own assessment.

Rural areas currently do not provide the most optimal conditions for WSS institutional development. The prevailing WSS business model in rural areas in Kazakhstan is the large farm or individual private operator. Both models have their roots in the kolkhoz-sovkhoz system, which was also responsible for rural social infrastructure, including centralised water supply systems in local communities. With liquidation of the kolkhoz-sovkhoz system, the infrastructure was initially transferred to local public administrations and then often to newly created farms or individual private operators; however, this process was a result of local circumstances and not adequately planned. Without a systematic approach, local authorities continue to co-operate with the two models, often without the support of licences or management and concession contracts; however, they have no other alternative.

The large farm or agriculture enterprise model may be an adequate option for self-supply or servicing surrounding households, but not for rural communities as a whole. A recommended alternative is community-based management, where the community itself is responsible for managing WSS services. The main drawback of this business model is the lack of the necessary human capacity for the provision of WSS services; this can be developed through external technical assistance and specialised services.

Although the first water user co-operatives were established several years ago in rural Kazakhstan, the community management model of WSS services is still not widely used, regardless of its benefits for
the rural population. Apart from legal, technical and financial issues (such as the high costs of making an inventory of existing WSS infrastructure), there are also social issues to consider in promoting and scaling up this model. Furthermore, mobilising local communities and strengthening village authorities is critical to build sustainability of WSS service delivery in rural areas.

In small towns, the small town water utility, or the multi-service utility, is the prevailing WSS business model in general. The small town water utility model does not address the challenge of a small WSS client base; if not subsidised, utility operations may not be financially sustainable.

To address this challenge, local authorities may also consider the model of the multi-service utility, e.g. combining WSS services with district heating (DH) services. Although both are infrastructure services, the synergies between the two have gone largely undeveloped. Multi-service utilities can benefit from sharing overhead costs and using the same pool of equipment and technicians, for example, thus addressing the human capacity constraints typical of small settlements. In theory, the approach works, but in practice, it creates a risk of hidden (unintended) and non-transparent cross-subsidies between the services. In this case, consolidation and regionalisation is the recommended option, but this requires a rayon for the required optimal scale. International experience also shows that voluntary consolidation and regionalisation is not an easy process for addressing a fragmented WSS institutional setup, which resulted from earlier decentralisation. As a result, the process needs to be either centrally managed, or implemented together with a significant incentive package.

In small towns, another possible and existing business model is the water utility that also delivers WSS services in neighbouring villages. In this case, the small size of the customer base is both an advantage and disadvantage: it allows for the provision of good quality WSS services, but usually does not generate enough revenue to cover the full costs of service delivery and extension.

The WSS sector regionalisation process may help address this challenge: in this model, WSS service delivery is in the hands of rayon water utilities, which service settlements within a given rayon. This solution requires time and investments to build the required structures; it can be improved by incorporating public utilities.

An additional complementary WSS business model is that of grouped water mains, which enables the delivery of water to communities that lack local water sources. However, large investments are needed for this business model, which results in a higher cost of water overall. Subsidising water transportation costs might be the only way to ensure sustainability.

Finally, a promising WSS business model for small towns and rural settlements is the private operator model (including small-scale and local private sector) working under management, lease or concession contracts (i.e. the PPP model). The main benefit of the PPP model is the opportunity to use private know-how for delivering WSS services; its main drawback is the need for a strong regulatory framework, as well as a suitably sized market of private operators.

Despite significant efforts to obtain data on WSS services in small towns and rural areas, the required information is not accessible. This presents a major obstacle for designing sound programmes for rural WSS development. Addressing this issue would require additional efforts to create a system for continuous monitoring of institutional development and performance of the WSS sector in small towns and rural areas.
5. RECOMMENDED BUSINESS MODELS FOR WATER SUPPLY AND SANITATION IN KAZAKHSTAN

Due to the low population density in Kazakhstan, individual (household) WSS systems will often serve people in rural areas. Only areas with sufficient population density and economic activity – such as urban centres and large villages – will be served by centralised (piped) WSS systems requiring professional operators. In the case of small towns and populated rural areas, the key recommended WSS business model for small towns and rural areas in Kazakhstan is the Rayon Vodocanal model.

Although the Rayon Vodocanal is mandated to deliver WSS services to all citizens of the rayon, the best approach will depend on local circumstances. For economic reasons, Rayon Vodocanals may operate only in communities with sufficient concentration of population and economic activity; other small and remote communities might have to use alternative WSS business models. WSS service delivery by community-based organisations (CBOs) are one such alternative that can complement the Rayonal Vodocanal model. Other types of models are multi-service utilities (typically in towns) and small-scale private operators.

The proposed Rayon WSS Master Plan should help define the communities that will be included in the service area of the Rayon Vodocanal, and those that will be served by a community-managed WSS, or by other complementary models, back-stopped by the Rayon Vodocanal. All these models are discussed below, one by one.

5.1. Rayon Vodocanal business model

Rayon Vodocanal is a water utility with the mandate to provide WSS services to the whole rayon or even to an area larger than one rayon (in case of inter-rayonal co-operation). The Rayon Vodocanal operates in several municipalities and settlements (including towns and villages). In such large areas, it is difficult to have only one centralised WSS system; in most cases, the Rayon Vodocanal will operate several independent centralised WSS systems, mainly in urban centres and perhaps extended to the surrounding rural areas. The benefit of the Rayon Vodocanal relates to the possibility of achieving economies of scale when merging smaller service areas together, and improving cost efficiency by centralising management, maintenance and backstopping functions.

Rayon Vodocanals can be created by merging and reorganising existing water utilities based in small towns through centralised management functions and decentralised operations. It is recommended that Rayon Vodocanals are incorporated as a company; limited liability companies are the preferred legal form for Rayon Vodocanals given the conditions in rural Kazakhstan. The initial capital of Rayon Vodocanals will consist of the assets of the water utilities being merged. An updated inventory and formal evaluation of the WSS assets will be needed for declaring the Vodocanals’ charter capital.

The Rayon Vodocanal will be fully owned by the respective rayon administration. Depending on local conditions, the merged water utilities may function as local branches of the Rayon Vodocanal or may be centres of operations. Management functions, including human resources and financial management, administration and other auxiliary functions, will be centralised in the main office of the Rayon Vodocanal. Operational functions related to WSS service delivery will be provided locally, based on the local infrastructure of the former water utilities of small towns and large villages.
Although the Rayon Vodocanal will own and operate centralised WSS systems mainly in urban centres, it might be obliged to provide supporting services to community-managed WSS systems within the administrative territory of respective rayons. These may include laboratory services like checking quality of drinking water, repair of water pipes and pumps, sanitation services like collecting wastewater and sludge from individual septic tanks, transport of wastewater to a treatment plant, etc. These services are very important for the sustainability of alternative WSS business models in communities not served directly by the Rayon Vodocanal. It is important that the various functions of Rayon Vodocanals are included in its statutes.

Similar to a limited liability company, the Rayon Vodocanal has a management and a supervisory board. It is recommended that members of the supervisory board are representatives of the communities served by the Rayon Vodocanal.

When creating Rayon Vodocanals, prior to making a final decision, a financial analysis should confirm the proposed structure will be financially sustainable. Considering the conditions of small towns and rural areas in Kazakhstan, including the low population density and low level of development of centralised WSS systems, Rayon Vodocanals will likely need a support programme for strengthening their capacity and financial sustainability.

5.2. Business model of community-based organisation for WSS services delivery

Rayon Vodocanals cannot be the sole and only business model for WSS services delivery in many rural areas; a complementary model is the community-based organisation (CBO). Community-managed, decentralised water supply systems are found to be quite successful in providing sustainable water supply services for rural communities, given they receive sufficient back-stopping technical support. Their basic characteristics are the following:

- Water sources should be located close to the community.
- CBOs (also known in Kazakhstan as water user co-operatives) should manage the WSS system.
- Communities should be highly involved during the construction, operation and maintenance of the system.
- The infrastructure is generally owned by local authorities, which grant operational concessions to water user co-operatives (in some cases, the co-operative may own fixed WSS assets).

The principle of mandating CBOs for the operations and management of WSS services is to put citizens in the centre of the management of small centralised WSS systems. Their participation throughout building, operating, maintaining and co-financing the system in their own community creates ownership, thus contributing to the sustainability of WSS services. The CBOs will need assistance in constructing their centralised WSS systems; as a general rule, local authorities provide investments with some small contribution from citizens, mainly related to financing households’ connections.

The organisational structure of CBOs includes regular general meetings, a management board and service staff, including an accountant. The general meeting involves all members of the water user co-operative; it has the authority to adopt a plan of work and water tariffs, as well as appoint the management board. The management board organises the work of the respective water user co-operative and makes operational decisions. Technical staff take care of operations; generally, just one person is responsible for technical operations of a small WSS system; accounting is another important function.
Water user co-operatives are non-profit organisations, meaning that any revenue generated by operations is used to maintain, develop or rehabilitate WSS systems.

5.3. Alternative WSS business models: Multi-service utilities and small-scale private operators

A multi-service utility is by definition a single company providing several utility services, including (but not restricted to) water supply and wastewater services. The model is widely used in some EECCA countries, notably in the Russian Federation and Ukraine. It is also present in other places in Western Europe (such as Germany and Italy) and in Central Europe (such as Serbia, Poland and Hungary), particularly in small municipalities. These multi-service utilities provide different types of municipal services, such as water supply and wastewater collection and treatment, district heating, municipal waste management, street cleaning, urban green space management, and housing management and maintenance. In Italy, in addition to the above, multi-service utilities provide gas and electricity distribution services. The advantage of a multi-service utility lies in its larger scope and scale, which enables it to cover overhead and maintenance costs from different sources, not only from water and wastewater services.

On the other hand, multi-service utilities have some disadvantages, which is why many countries do not use them. A major challenge is related to the proper allocation of costs attributed to different services, which requires enhanced accounting skills and information technology. In another disadvantage, which reduces the applicability of the model in Kazakhstan, it is not always possible to provide other public services in combination with water supply and wastewater. For example, district heating, urban green space management and street cleansing, and housing management and maintenance are organised in larger towns only. Furthermore, the optimal size of the service areas might be very different for different utility services. This model can still be applied, even with different service areas, but needs to be carefully considered prior to implementation.

Another alternative WSS business model that could be used in rural areas is the private operator model, typically small-scale. Currently, many small private operators deliver WSS services in rural areas in Kazakhstan. However, these operators often do not have the full legal rights to provide WSS services; local authorities are aware of this, but no measures are taken as they do not have any alternative. If the involvement of small private operators in the WSS sector can be formalised, the model could become a viable option for rural areas.

Retaining small private operators to provide WSS services is more advantageous in two cases:

- Private operators have better access to water sources or to specific WSS infrastructure (e.g. WWTP).
- Private operators have built and operated small-scale facilities (e.g. WTP or WWTP) locally, and provide in-house professional maintenance services.

5.4. Complementarity of proposed business models

A summary on the complementarity of recommended WSS business models for small towns and rural areas in Kazakhstan is presented in Table 9 below. The main recommended WSS business model is the Rayon Vodocanal, which can be a standalone model or complemented by other models more suitable for remote small rural communities, like community-managed WSS or small private operator. The Rayon Vodocanal needs to offer specialised backup services to these two complementary models to ensure they are technically sustainable. In this way, all the models complement each other: the Rayon Vodocanal will sell its expertise and engineering services, while the community-managed WSS or small private operator
will serve rural communities that the Rayon Vodoncanal cannot service because they are either too small (to provide a profitable customer base) or too far away (which makes its services too costly).

In addition, Table 9 presents the model of multi-service utility that helps achieve economies of scale by providing other communal services together with WSS services.

**Table 9. Complementarity of proposed business models**

<table>
<thead>
<tr>
<th>Business model</th>
<th>Service area</th>
<th>Degree of regionalisation</th>
<th>Legal form of service provision</th>
<th>Professional back-up services</th>
<th>Complementarity to other business models</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rayon Vodocanal</td>
<td>Rayon (or a large part of it; or several neighbouring rayons)</td>
<td>Regionalised</td>
<td>Limited liability or joint stock company</td>
<td>Provided in-house</td>
<td>Could be a standalone model or complemented by other business models used in some settlements</td>
</tr>
<tr>
<td>Community-based organisation</td>
<td>One settlement, or a group of neighbouring settlements</td>
<td>Decentralised</td>
<td>Community-based organisation</td>
<td>Provided by Rayon Vodocanal</td>
<td>Limited to remotely located settlements, co-exists well with Rayon Vodocanal which shall provide professional backstopping services to CBOs</td>
</tr>
<tr>
<td>Private operator(small-scale)</td>
<td>One settlement, or a group of neighbouring settlements</td>
<td>Decentralised</td>
<td>Private</td>
<td>Some (like lab test) provided by Rayon Vodocanal, but some provided in-house</td>
<td>Limited to remotely located settlements Can co-exist with other models</td>
</tr>
<tr>
<td>Multi-service utility</td>
<td>Single town, or rayon (or a large part of it)</td>
<td>Regionalised or operating in any specific town</td>
<td>Limited liability or Joint stock company</td>
<td>Provided in-house</td>
<td>Can co-exist with other models</td>
</tr>
</tbody>
</table>

*Source: Authors’ own.*
5.5. Towards on action plan on implementing the recommended WSS business models

The recommended Rayon Vodocanal business model assumes the rayon administration organises WSS service provision on its territory by establishing Rayon Vodocanals. In addition to deliver WSS services on the territory of rayon, Rayon Vodocanals will also facilitate and support complementary business models, where needed.

The Rayon WSS Development Plan (Master Plan), which should be prepared and approved by the rayon administration, outlines specific arrangements. In addition to engineering designs for WSS infrastructure, the plan should analyse a variety of WSS business models and select those that best suit local hydrological, engineering, financial and social conditions. It must outline the proposed WSS business models at the local level and their respective service areas in the mid- and long-term. The plan should indicate which areas will have to rely on self-supply of WSS services, those which are or will be under community management of WSS services, and those where WSS services are or will be delivered by the rayon water utility. An important part of the plan should be the affordability analysis, confirming the financial sustainability of the recommended models.

The local population living in territories adjacent to the WSS service area should have the right to participate in the decision-making process. They can choose to be served by a rayon WSS operator, or form their own community management organisation (co-operative or association) to provide WSS services.

The rayon administration will cover initial investments to build small centralised WSS systems, and will own WSS infrastructure built in the entire rayon territory. The infrastructure will then be transferred to the Rayon Vodocanal, or will be subject to concession or lease agreements with the respective water user association or co-operative, or small-scale private operator. This will require reviewing the existing legislation related to leases and concession agreements in order to allow rayon administrations to enter into respective contracts with operators.

The Rayon Vodocanal, acting on behalf of the rayon administration, should be responsible for: a) providing back-stopping assistance to the community-based and other small-scale operators of WSS systems in the rayon (e.g. lab tests of water, leak detection, major repairs, etc.); and b) monitoring the provision of WSS services in the entire territory of the rayon.

Rayon administrations will have full responsibility for organising WSS provision on the whole territory of respective rayons. However, village administrations should help them organise community management of WSS services. Village administrations should be responsible for supporting their citizens in establishing water user associations or co-operatives, and in operating WSS infrastructure.

To deliver WSS development across a larger area, the rayon WSS Development Plans may need to be co-ordinated with, or approved by, respective oblast public authorities. Central and oblast governments should provide financial and technical assistance to rural rayons in developing and implementing WSS Development Plans (e.g. by adopting and disseminating methodological and guiding documents, providing training for officers of rayon administrations responsible for WSS, etc.).

This approach needs to be clearly established in law. The national legal framework should strengthen the responsibilities of the rayon administrations and authorise them to develop Rayon WSS Development Plans and establish Rayon Vodocanals. It is recommended that relevant legal provisions are included in the law and regulations on the WSS sector.

A legal review will be also needed for community-managed WSS services. Currently, the legal basis for community management of WSS services in Kazakhstan is the Law on Rural Co-operatives. One
option is to review and adjust the existing legislation; another option is to elaborate a dedicated law specifically on water user associations and co-operatives. Given that community management of WSS services is recommended as the prevailing WSS business model in small and remote rural communities, it is recommended to adopt a dedicated individual law on water user associations and co-operatives.

It is recommended to review the existing monitoring and evaluation (M&E) system, and ensure its effective functioning. Existing statistical forms on WSS, for example, should include information on institutional and legal forms of WSS service delivery. Such information collected locally should be first aggregated at rayon level, and next at oblast and national levels. The information will help monitor and evaluate the institutional development of WSS services and make any necessary corrections.

The development of the WSS sector requires not only investments in infrastructure, but also in local capacity. Apart from engineering and management expertise, financial and economic expertise also needs to be developed within the WSS sector, including feasibility studies and affordability analysis. It is recommended to build the capacity of the relevant institutions, or market, with this expertise at the rayon and oblast levels.

To develop the capacity of water user associations and co-operatives, it is recommended to help them form a union or a federation at the oblast or national level. The union or federation will be a centre of needed expertise for its members and represent their interests in relation to local authorities.

The recommended WSS business models should be overseen at the national level and managed according to project management principles. Although the programme will be implemented at local level, a clearly identified implementing agency at central level should be responsible for planning, legal framework development, necessary strategic and operational guidelines, and monitoring progress in developing the recommended WSS business models.

It is advised to consider a phased approach where the Rayon Vodocanals will be created and Rayon WSS Development Plans elaborated in selected pilot rayons. To facilitate scaling up the experience, all necessary guidelines and best practices (e.g. Guidelines for Reforming Rural WSS, standard contracts, a template for the Rayonal Master Plan, etc.) should be developed and pilot tested. The recommended WSS business models should be piloted in partnership with donors and international organisations that are developing WSS in Kazakhstan.
6. BIBLIOGRAPHY

Council of Europe, European Charter of Local Self-Government.


7. ANNEXES

7.1. A brief overview of WSS in reviewed countries

This annex presents a brief general overview of WSS in selected countries. They are grouped as proposed in Annex 7.18. According to the project’s terms of reference, the review was initially done only for EECCA countries. However, in response to a request by the Committee of Architecture, Housing and Utilities of the Ministry of Regional Development, it was expanded to include a review of selected European countries. As a result, the review was done for the following countries:

- Armenia
- Azerbaijan
- Czech Republic
- Finland
- France
- Georgia
- Italy
- Kyrgyzstan
- Poland
- Romania
- Russian Federation
- United Kingdom
- Ukraine
- Tajikistan
- Turkmenistan

These countries represent various levels of economic development with gross domestic product (GDP) per capita based on Purchasing Power Parity (PPP) ranging from USD 2,173 (Tajikistan) to USD 36,569 (United Kingdom); population density ranging from 10 residents per km² (Turkmenistan) to 259 residents per km² (United Kingdom). Table 10 presents the basic geographic and economic characteristics of the countries selected for the review of WSS management.
Table 10. Basic information on countries selected for the review of WSS management

<table>
<thead>
<tr>
<th>Country</th>
<th>Location</th>
<th>Area</th>
<th>Population</th>
<th>Density</th>
<th>GDP PPP 2013</th>
<th>GDP PPP per capita 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>km²</td>
<td>mln</td>
<td>persons/km²</td>
<td>billion USD</td>
<td>USD</td>
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<td>Italy</td>
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<td>301 338</td>
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<td>198</td>
<td>1 835.66</td>
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<td>Western Europe</td>
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<td>116</td>
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<td>35 941.52</td>
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<tr>
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<td>Northern Europe</td>
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<td>201.74</td>
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<td>133</td>
<td>292.54</td>
<td>27 662.99</td>
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<td>Central Europe</td>
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<td>123</td>
<td>824.78</td>
<td>21 005.39</td>
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<tr>
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<td>Kazakhstan</td>
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<td>7</td>
<td>248.56</td>
<td>14 750.46</td>
</tr>
</tbody>
</table>

Note: * - PPP here stands for the “purchasing power parity”

Countries with a low degree of consolidation and a low degree of delegation: Kyrgyzstan, Ukraine, Poland, Finland and the Russian Federation

The water and sanitation sector in Kyrgyzstan can be characterised by decentralised mandates, high water losses and poor condition of infrastructure. More than 1 050 centralised domestic systems supply drinking water to the population. A majority of existing water supply systems requires capital repairs; 40% are beyond their design life and are out of order; 261 fail to comply with sanitary requirements. Some 92% of the population has access to piped drinking water. However, only 26% of the population lives in the sanitation coverage area. The process of WSS rehabilitation is constantly evolving, but a major effort is still needed to achieve a significant level of services, especially in rural areas. Community management is the prevailing business model for WSS in rural areas.

Water supply and sanitation services In Ukraine can be characterised by high rates of consumption of water per capita and per day, inadequate maintenance of infrastructure and insufficient financing of the WSS sector. Ukraine has relatively high water supply coverage (83.3%), but the rate of connections to the sewerage system is rather low. The main challenges for the sector are high rates of water losses and ageing WSS infrastructure. Mandates in the WSS sector are shared between the national government, regional authorities and local governments, with the latter responsible for delivering WSS services to the local population. In fact, WSS services declines with the size of the settlement. The experience of Ukraine says that a proper WSS managing model requires a balance of different administrative levels: central, regional and local, and special attention should be paid to fragmented municipalities.
The water supply and sanitation sector in Poland is in relatively good shape, with continuous development of the sector through national and EU funding. Polish municipalities are responsible for providing water in the required quantity and quality, as well as for sanitation services within their territory. In urban areas, both water supply and sewerage network coverage is almost 100%, while in rural areas this indicator is somewhat lower. Although the WSS sector is well developed in Poland, investment is still needed. The main focus should be on improving the situation in small towns and rural areas, especially for sanitation services. The municipal water utility is the prevailing business model for WSS in small towns and rural areas. Most are operating as limited liability companies, but there are also examples of budgetary organisations. Looking for economies of scale in the service area, some municipalities have entered into inter-municipal co-operation agreements. In this case, WSS infrastructure is extended from the city to surrounding rural municipalities, or a municipal association is established for joint operation of WSS infrastructure on larger territories. In less populated rural areas, people use individual wells and septic tanks and have to transfer sewage to a wastewater treatment plant (WWTP).

Water supply and sanitation services in Finland are well developed. Municipalities are responsible for the provision, overall development and organisation of WSS services in their jurisdiction in accordance with the Water Services Act. Municipalities may provide WSS services themselves or outsource them to private companies, but they are only responsible for the WSS sector in municipal (urban) centres. In rural areas, this is the mandate of consumer-managed water co-operatives, which distribute water to small villages (consisting of a number of farms and houses) or to individual households (approx. 10% of the population). Water co-operatives may be run under one of two models. In the first model, water is purchased from municipal water networks, and co-operatives take care of the investment, operation and maintenance of their own local system (distribution networks and pumping stations). In the second model, co-operatives have their own sources of water supply and are also responsible for water intake and treatment. The municipal utility of a particular region determines water and sanitation tariffs in rural co-operatives, although municipalities are not responsible for WSS services in rural areas. Municipal services in small towns and nearly all small rural co-operatives clearly run at a loss, and municipalities have to support them financially.

In the Russian Federation, WSS sector reforms are insufficient for the sector’s needs. Despite having a quarter of the world’s drinking water resources, Russia is facing considerable difficulties in solving problems associated with rational and safe water and sanitation management. In many cities and most rural areas, the existing water supply system consists of obsolete infrastructure, and investment and implementation of new technologies have not kept up with the breakdown of key assets. Municipalities organise, maintain and develop WSS services, although regional governments own WSS systems in a few cases. Only 67% of the Russian population has access to piped water services. Private operators are getting more broadly involved in the sector; however, the privatisation of the WSS sector has had some mixed results.

Countries with a high degree of consolidation and a low degree of delegation: Tajikistan, Turkmenistan and Azerbaijan

In Tajikistan, the State Unitary Enterprise KhMK is in charge of both WSS policy and WSS services, which are provided by subsidiary water utilities. The largest Tajik cities function outside of KhMK control; they are directly responsible for providing WSS services to their population. Community management is the prevailing business model for WSS in rural areas. At a crossroads between decentralised and centralised WSS management models, the country is considering regionalisation as another option.

On average, 57.6% of the Tajik population has access to centralised water supply services (87% of the urban population and 43% of rural residents). Although coverage rates in urban areas seem relatively high, water supply and sanitation systems are neither reliable nor safe: there are serious problems with water
quality in Tajikistan. Tariffs for potable water do not cover the operational costs of WSS services, which has brought a major part of WSS facilities into a critical condition. The Tajik government has implemented several reforms, laws and national plans, and received international investments. However, a massive effort is still needed to improve the WSS sector situation. Measures should be taken to improve drinking water quality and increasing WSS coverage, especially in small towns and rural areas. Recently, with assistance from the European Bank for Reconstruction and Development (EBRD), the government of Tajikistan has been implementing a nationwide programme for rehabilitating WSS infrastructure. At the same time, it is studying whether regionalisation of water utilities could improve operational efficiency.

Most existing WSS systems in Turkmenistan were built between the 1950s to 1980s. As a consequence of poor management in the 20 years following the country’s independence, the quality of WSS services has drastically deteriorated. Providing sufficient volume of quality water to individual consumers is still a challenge. WSS utilities have been providing WSS services on their territory since 2011. The participation of private entities in the WSS sector in Turkmenistan is marginal. About 63% of the Turkmen population is supplied with water through centralised water supply systems (84.5% of the urban population and 42.1% of the rural population). Therefore, increasing access to safe potable water has been officially recognised as a national priority.

In the Republic of Azerbaijan, WSS infrastructure in rural areas is not yet sufficiently developed. Water supply coverage in rural areas is estimated to be as low as 15%, and these are usually settlements benefiting from neighbouring urban WSS infrastructure. The rest of the population draws water from individual wells or irrigation canals; in some rural settlements, community-based organisations play a role in managing the provision of WSS services. Centralised sanitation systems in rural areas are very rare. In many mid-sized and small towns, water treatment facilities are mostly dysfunctional or completely non-existent. In small towns, local water utilities operate WSS infrastructure, which are controlled by a single national operator – Azersu OJSC. It is expected that consolidated local water utilities will extend their service areas to provide WSS services to surrounding rural settlements.

**Countries with low degree of consolidation and high degree of delegation: France and Czech Republic**

The model of WSS management in France is based on many small-sized municipalities (communes, each having 1,500 people, on average) that deliver WSS services. Therefore, this model is classified as one with a low degree of consolidation. However, small municipalities looking for economies of scale in WSS services may enter into inter-municipal co-operation by forming large WSS service areas. At the same time, WSS service delivery is often delegated to private companies through a contract, and from this point of view the model has a high degree of delegation. The market of private operators is strongly consolidated, meaning that a few big companies dominate the market. The business model of WSS services in small towns and rural areas is a delegation contract (which can take the form of an affermage, concession or management contract) with a private company. Usually it is done through a municipal association formed by several communes. The remaining communes (some 20%) use the model of direct management of WSS services, and establish their own municipal services or enterprise. Recently, there has been an ongoing discussion about private companies in the WSS sector with a visible trend towards “re-municipalisation” of WSS service delivery.

The Czech Republic uses a WSS management model similar to France. About 83% of rural residents are supplied with piped water, compared with a national coverage rate of 93.5%. According to OECD data, rural settlements (with fewer than 2,000 residents) constitute 89.8% of all municipalities; in most cases, they form inter-municipal co-operation structures to provide WSS services on larger territories. Private operators supply most rural settlements (about 97%) with water. Under a lease contract, the operator pays a monthly fee for the municipally-owned water system in return for an exclusive right to operate it and to collect tariffs from the customers. The Ministry of Finance determines tariffs based on the value of the
commodity (supplied water). This means that WSS companies do not have total freedom in setting water tariffs. The affordability of the tariff and the need to provide for reasonable profit are regulated. The WSS market is highly consolidated, with the main share of the market represented by several private companies, the largest share being held by a subsidiary of Veolia.

Countries with a high degree of consolidation and a high degree of delegation: Italy, Romania, Georgia, Armenia, and England and Wales

Water supply and sanitation services in Italy can be described as problematic. There is insufficient access to water due to long seasonal periods of drought and inefficient management of water resources. However, the percentage of population connected to water supply networks is rather high, at 97%. Responsibilities for WSS services are in the hands of 91 Optimal Territorial Areas (ATOs). The main issues in the WSS sector are the fragmentation of legal competencies and institutional responsibilities, along with insufficient co-ordination between all stakeholders. Other characteristics of Italian WSS services include the highest consumption rate of drinking water per person in Europe and substantial water losses due to high leakage in water networks, the average age of which exceeds 30 years. Despite several reforms in the WSS sector, further investment, especially directed at water conservation measures and renovation of the infrastructure, is required to overcome existing problems. Rural areas benefit from the regionalisation of the WSS sector; as part of ATOs, they are served by regional water utilities and pay the same water tariff as urban areas.

In Romania, WSS services delivery in small towns and rural areas is based on an inter-community development agency and a regional model of operations. However, in practice, it relates only to a small percentage of the rural population. Most people in rural areas rely on individual wells and tanks, as 21% of the rural population benefits from centralised drinking water supply and only 11% from centralised sanitation systems. Romania is going through a regionalisation of the WSS sector, and in the near future will make a massive effort to develop WSS in rural areas. Additional infrastructure improvement is also needed to minimise water losses and to enhance the quality of supplied water. Overall, with the help of the EU, Romania is successfully improving its WSS sector, and that trend is expected to continue.

Armenia is an example of successful implementation of regionalisation and public-private partnerships in the WSS sector. Nearly 75% of the population in both urban and rural areas are served by regional water utilities operating under a PPP model (management contract or lease contract). The remaining 25% in rural areas receive WSS services under the community management model. Recently, the government of Armenia with the assistance of KfW has been conducting a feasibility study on inclusion of the remaining rural municipalities in the service areas of regional water utilities. In the past, the local population did not accept this option because they did not want to make regular payments for water. If the option is found feasible this time, the entire country would be served by regional water utilities operating under the PPP model.

In Georgia, ensuring access to safe drinking water is still a major challenge. The situation in the water supply and sanitation sector is extremely complex. Most WSS systems are in critical condition due to anthropogenic contamination, non-compliance with sanitary standards and the difficult economic situation. A substantial share of water consumers experience difficulties paying for water supply services and sewage disposal. Moreover, 60% of the water pipes and half of the sewage collectors are in a dilapidated state; water quality indicators often do not meet human health and safety standards, and large quantities of water are lost to leakage in the networks (around 40% of total supply). In Tbilisi and Rustavi, the WSS systems have been privatised and are now privately owned by the Georgian Water & Power company. WSS systems in other settlements outside Adjaria are state-owned (with the Ministry of Regional Development representing the owner), but operated by a single operating utility.
Approximately half of the population has access to centralised WSS services. WSS systems are considered to be a key component in ensuring a clean environment and the good health of Georgian people, especially in rural areas.

Public water supply and sanitation services in the United Kingdom are characterised by good service quality and universal access. The WSS sector operates through a variety of institutional arrangements, which are different in England and Wales on the one hand, and Scotland and Northern Ireland on the other. In England and Wales, the sector is fully privatised; in Scotland and Northern Ireland, a national operator in each country provides WSS services. The percentage of the population served with supplied water and sanitation is near 100% and 97%, respectively. There is no great difference in WSS services between urban and rural areas. The high percentage of the population supplied with WSS services, as well as the shared regulatory and legislative framework, enable small towns and rural settlements to benefit from the same level of WSS services as urban areas. In England and Wales, private regional water utilities provide WSS services. Individual metering and tariff rates are uniform in the entire service area, and differences in rates depend on the zone. A national water regulator, Ofwat, regulates increases in tariff rates. A key issue concerns the condition of the infrastructure that needs to be rehabilitated to reduce water losses, not only in small towns and rural areas, but in many urban areas in the United Kingdom. Unfortunately, achieving this goal would require successive increases in water tariff rates, which may not be acceptable to the regulator.
7.2. Case study: WSS development in Armenia

Regionalisation and public-private partnership as the key factors in improving WSS management in Armenia

Background

Armenia is a country in the South Caucasus region of Eurasia, bordered by Turkey (west), Georgia (north), Azerbaijan (east), and Iran and the Azerbaijan exclave of Nakhichivan (south). The country covers an area of 29,743 km². The population of Armenia is about 3.4 million people, with an average population density of about 114.31 inhabitants per km². In 2013, according to the International Monetary Fund, the gross domestic product based on purchasing power parity was USD 20.83 billion (GDP PPP per capita USD 6,128). The climate of Armenia is highland continental, with hot summers and cold winters. The terrain of the country is mostly mountainous. Armenia is in a relatively favourable situation in terms of natural reserves of water resources. The total amount of renewable water resources in the country is around 7.8 km³. Most of the drinking water in Armenia comes from mountain springs and is of high quality (96%).

Political system and administrative-territorial division

Armenia is a unitary presidential democratic republic. The president is the head of the government and of the multi-party system. Executive power is in the hands of the government, while the legislative power is vested in both the government and the unicameral parliament. Armenia is divided into ten provinces and the capital city, Yerevan, with special administrative status. The chief executive in each of the provinces (marz) is the governor (marzapet) appointed by the government. The average land area of a province is 2,704 km². The average population of the provinces, excluding Yerevan, is 0.23 million residents. The provinces are further subdivided into self-governing communities. Armenia includes 915 communities, 49 of which are urban and 866 rural. Yerevan has a special status as the capital city. It is estimated that 64% of the Armenian population lives in urban areas and 36% in rural areas.

WSS sector development

In 1996, the Law on Local Government defined the supply of water and sanitation services as a mandatory responsibility of local governments. In 1997, in accordance with the law, WSS enterprises and distribution networks were transferred to the ownership of the respective municipalities. In 1999, with financial help from the World Bank, Armenia took the first step towards the participation of private companies in water supply through a management contract between Yerevan City (Yerevan Djur CJSC) and an Italian firm Acer & Company; the Armenian Utility S.C.A.R.L. followed with a lease contract with Veolia Water, which became responsible for water supply and sanitation services in Yerevan. Further reforms, such as the Reform of Water System Management (2001), Water Code (2002), National Water Policy (2005) and National Water Program (2006) allow for higher efficiency in water management, improvement in tariff policy, creation of a new institutional framework, and decentralisation and privatisation of the water sector. The State Committee of Water System under the Ministry of Territorial Governance of the Republic of Armenia is in charge of the management and operations of the water supply and sanitation sector.

Based on the positive experience of introducing the first private water service operators, similar contracts were offered to other private companies. Currently, all public-private partnerships (PPPs) in WSS in Armenia are run under two models: management contract and lease contract. Over the past decade, Armenia has adopted an institutional model that combines public investments with private sector operation and regionalisation of water utilities. As a result, over two-thirds of the country’s population (including all
the urban population) receive their drinking water from regional water utilities managed by private companies. Only water supply is included in the contracts with private companies; the private sector is still responsible for sanitation, and this is not well developed everywhere in Armenia. After the reorganisation of the WSS sector, the following water utilities operate in Armenia:

- **Yerevan Djur CJSC** operated by Veolia Water (France) under a lease contract for 2006-16, while investments are funded from the World Bank loans (first project: 1998-2005, second project: 2006-11); and the government of France (third project: 2008-13). The water utility serves the city of Yerevan and 32 adjacent rural settlements, a total of 1 030 000 people.

- **Armenia Water and Sewage CJSC** operated by Saur (France) under a management contract for 2004-08, extended until 2014. Investments are funded from loans and grants provided by the World Bank loan (first project: 2005-08, second project: 2009-11), the EBRD loan and grant project (2007-12), and the ADB loan and grant project 2008-12). Armenia Water and Sewage CJSC serves 37 urban and 271 rural settlements, a total of 619 000 people.

- **Water Utilities of Shirak, Lori and Nor Akunq** in the form of closed joint stock companies (government, 51%; municipalities, 49%) operated by a consortium consisting of MVV Decon GmbH, MVV Energie AG from Germany and AEG Service LLC from Armenia under a management contract (KfW loan first project 2000-10, KfW loan second project 2004-14). The water utilities serve 5 urban and 61 rural settlements, a total of 375 000 people.

- **The remaining 560 rural settlements on the territory of Armenia are served by community-based organisations.**

According to a World Bank report, 97% of the population has access to improved water sources (household connections, public standpipes, boreholes or protected wells); 99% of the urban population and 94% of the rural population have access to improved water sources. It is estimated that, in the biggest cities in Armenia, over 95% of residents are supplied with drinking water by the WSS sector. In small cities or rural settlements, it varies from 20-80%. In Yerevan, daily water consumption has visibly decreased to 100 litres per capita per day as a result of increased water rates and payments, based on the readings of individual water meters. Based on data from the Public Services Regulatory Commission of the Republic of Armenia, the average price of water in 2013 amounted to AMD 120/m³ (approx. USD 0.30), while the tariff for the discharge of wastewater was AMD 29/m³ (approx. USD 0.07). The charges for wastewater are lower because wastewater treatment in Armenia is not yet fully developed (at most, only mechanical treatment of wastewater is functioning).

**WSS business models in small towns and rural areas**

About 36% of the Armenian population lives in small towns or rural settlements, which can be categorised into three groups. The first consists of rural settlements, which are served by one of the existing regional water utilities (45% of the rural population). The second consists of a group of rural settlements with a centralised piped water supply system managed by community-based organisations (about 50% of rural population). The remaining 5% of the population lives in settlements with no centralised water supply network. Around 950 000 rural residents are not served by regional water utilities operated under PPP contracts. KfW encouraged and supported the government of Armenia to include the remaining rural areas into the service areas of existing regional water utilities. In the past, these attempts were met with strong resistance from the population, which did not want to pay fees for their water. If the option is implemented, the entire territory of Armenia, including urban and rural territories, will be served by regional water utilities operating under the PPP model.
Lesson learned for Kazakhstan: The process of WSS sector regionalisation, combined with the adequate presence of private sector organisations, may be a good way to improve the general WSS sector situation. The country-wide privatisation of WSS systems management should first be preceded by pilots in a relevant area, e.g. in a city with a high level of WSS service development. The policy of low sector consolidation combined with a high level of delegation of services may also guarantee the development of WSS infrastructure.

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7.3. Case study: WSS development in Azerbaijan

Centralised model based on national water utility

Background

Azerbaijan is a country in the Caucasus region of Eurasia bordered by the Russian Federation (north), Georgia (northwest), Armenia (west), Iran (south) and the Caspian Sea (east). The exclave of Nakhchivan is bordered by Armenia (north and east), Iran (south and west) and Turkey (northwest). The country covers an area of 86,600 km². The population of Azerbaijan is about 9.3 million people, with an average population density of about 107 inhabitants per km². Azerbaijan’s economic system is based on different types of property, transition to a market economy and integration into the global economy. In 2013, according to the International Monetary Fund, the gross domestic product based on purchasing power parity of Azerbaijan was USD 102.43 bln (GDP PPP per capita USD 11,004). The climate of Azerbaijan is very diverse: 9 out of 11 climate zones are represented. Water resources are limited with a total amount of surface water resources varying from 28.5-30.5 km³. The main source of water supply is surface water, the quality of which can be degraded by high pollution levels.

Political system and administrative-territorial division

Azerbaijan is a unitary constitutional republic with a government organised on the principle of the separation of powers. The constitution stipulates that the president holds the executive power. The legislative power is exercised by the unicameral parliament, and the judicial power is held by independent courts. The Autonomous Republic of Nakhchivan is a land-locked exclave of Azerbaijan. It consists of eight districts and has its own government, elected and approved by the Parliament of Nakhchivan Autonomous Republic. The Republic of Azerbaijan is divided into 66 regions, 78 cities (including the capital city Baku), 14 urban districts, 262 settlements, 1,721 rural territorial units and 4,255 rural settlements. Over 2 mln people live in Baku and over half of the population lives in urban areas (4.96 mln people).

WSS sector development

Azerbaijan inherited a relatively extensive water supply system from the former Soviet Union. Due to mismanagement and lack of investment, the infrastructure is in urgent need of rehabilitation and upgrading. About 95% of the population in Baku and 83% of those living in secondary cities and small towns are connected to centralised water systems, but the quality of infrastructure and services is very low. In many secondary and small towns, water treatment facilities are largely dysfunctional or completely inexistent, leaving the population in these towns without access to safe water. In addition, the piped water supply is unreliable almost everywhere in the country; it is often available fewer than 12 hours per day. In rural areas, centralised water supply systems are rare, with less than 33% of the population having access to piped water supply.

The main regulatory act in the sphere of water supply is the Water Code (1997). Based on the Water Code, the Laws on Water Supply and Wastewater (1999) and On Melioration and Irrigation (2007) were adopted. Water policy is implemented through national action plans and government programmes. The Law on Water Supply and Sewage divides the territory of the country into zones of water supply and (or) discharge of sewage. In these zones, local WSS utilities conduct their operations in accordance with the legislation and contracts made with local executive authorities. Local water utilities are managed and co-ordinated by Azersu JSC, the national water utility in charge of implementing state policy in the field of WSS.
The history of the current institutional structure of the WSS sector goes back to 1995. At that time, to improve WSS in the cities of Baku, Sumgayit and Absheron, the Absheron Regional Joint Stock Water Company was established in place of two former public entities, Kommunensayesutejhizaty Production Union and AzSuGEO Scientific-Research Institute. The next significant structural change happened in 2004 when, in accordance with the Decree of the President of the Republic of Azerbaijan on the Improvement of Management in the Field of Water Supply System in the Republic of Azerbaijan, the Absheron Regional Joint Stock Water Company was reorganised into Azersu JSC. At the same time, structural changes at the regional and local levels merged local water utilities and transferred them under the control of Azersu JSC. The main functions of Azersu JSC, which is fully owned by the government, are to manage the subordinated local water utilities and institutions, co-ordinate and supervise their operations, and develop proposals on the implementation of state policy in this field.

Azerbaijan has declared its commitment to use part of its new oil wealth to address infrastructure deficiencies in the WSS sector and to develop the sector so it becomes financially sustainable. Important steps towards this goal include a large nationwide water programme consisting of numerous projects, financed by international development institutions (WB, ADB, KfW) and the state budget. These projects will rehabilitate and construct WSS infrastructure in all secondary cities across the country and in the greater Baku area. They will also target institutional development, including the consolidation of local water utilities, the introduction of international financial reporting standards (IFRS), the application of European water supply and wastewater standards, a comprehensive training programme for operational and managerial staff, a new billing and collection system and the establishment of a Geographic Information System (GIS)-based asset management system.

In 2012, according to the Azerbaijan Statistical Office, 4.7 million residents in Azerbaijan (51% of the population) were supplied with drinking water. Losses of water during transportation amounted to 4236 mln m\(^3\) (51% of total consumption) due to the poor condition of the infrastructure. Compared to 2011, the amount of average daily supplied water for personal needs decreased by 16% and amounted to 56.9 litres per capita per day (94.4 l cd in urban areas and 14.4 l cd in rural areas). The highest percentage of residents supplied with drinking water from centralised water supply systems was recorded in Baku, Sumgayit and Ganja city (95%). The sewage network in Baku serves about 72% of the city, but only around 50% of the wastewater is treated. In other urban areas, both water and sewerage network coverage is much lower (around 35%). In 2007, new tariff rates for drinking water were imposed and are continuously increasing. In 2012, according to the Azerbaijan Statistics Office, the cost of 1 m\(^3\) of water was AZN 0.26 (approximately USD 0.33) for the population of Baku and other major cities. The increase also applied to sanitation services. In Baku and other major cities, the population will pay monthly AZN 0.30 per person (approx. USD 0.38). Compared to 2011, the tariffs for water increased by 3.2% and for sanitation by 1%. Despite high coverage in urban areas, the WSS sector is a major issue in Azerbaijan development policy. According to the country’s National Program for Sustainable Socio-Economic Development, every person in Azerbaijan should have access to quality water by 2015.

**WSS business models in small towns and rural settlements**

WSS infrastructure in rural areas is not yet developed. The percentage of water supply coverage in rural areas is estimated at 15%, and these are usually settlements benefiting from adjacent urban WSS infrastructure. The rest of the population draws water from individual wells or irrigation canals; in some rural settlements, community-based organisations play a role in providing WSS services. Centralised sanitation systems are very rare in rural areas. In many secondary and small towns, water treatment facilities are largely dysfunctional or completely non-existent. Local water utilities controlled by Azersu JSC operate WSS infrastructure in small towns. It is planned that consolidated local water utilities will extend their service areas to cover surrounding rural settlements.
Lesson learned for Kazakhstan: The high degree of consolidation of the WSS sector theoretically guarantees good control of all actions related to WSS services. In practice, the efficiency of supervision is not sufficient, possibly due to inadequate monitoring tools, especially in the context of small rural settlements. Re-decentralisation of the WSS segment, after its high centralisation, seems to be difficult to pursue due to financial constraints.

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7.4. Case study: WSS development in the Czech Republic

**WSS management from the roof of Europe: The case of the Czech Republic**

**Background**

The Czech Republic is a country in Central Europe bordered by Germany (west), Poland (north), Slovakia (east) and Austria (south). The country covers an area of 78 864 km². The population of the Czech Republic is about 10.5 million people, with an average population density of about 133 inhabitants per km². In 2013, according to the International Monetary Fund, gross domestic product based on purchasing power parity of the Czech Republic was USD 292.53 bln (GDP PPP per capita USD 27 663). The climate is temperate and continental. The Czech Republic is situated on the divide of three seas, which separates its territory into three main catchment areas. This is why the country is called the roof of Europe. Practically all significant watercourses bear water to the territories of the neighbouring countries. Generally, renewable water resources are limited; their volume is around 13.2 km³.

**Political system and administrative-territorial division**

The Czech Republic is a unitary country with representative democracy in the form of a bicameral parliament, consisting of the Chamber of Deputies and the Senate, and the president as head of state. At the national level, the central government is the highest tier of local executive power. Since 2000, the Czech Republic has been divided into 14 self-governing areas: 13 regions, each with its sub-capital city, and the capital city of Prague. Regional self-government is exercised through regional assemblies and presidents. In Prague, local government is represented by the city council and the mayor. The average area of a region is 5 633 km². The regions are further subdivided into 73 districts, but district authorities were eliminated in 2003. There are 6 251 municipalities in the Czech Republic, of which 1 461 (24%) have fewer than 200 inhabitants, and 602 have the status of a city.

**WSS sector development**

The Czech Republic’s water supply and sanitation sector is in good shape and continuously developing. Until 1993, 11 state-owned municipal companies operated in the WSS sector. In 1991, the Czech government developed basic principles for reforms and transformation processes. In 1993, after the approval of these acts and principles, the Czech government delegated administration of the WSS sector to cities and municipalities, which resulted in successive privatisation processes. This led to the splintering of the WSS structure into approximately 40 district water management companies and 1 200 small operators with various forms of ownership. In 1992, the companies involved in the WSS sector established a voluntary nongovernmental association, SOVAK CR, with the aim of defending the interests of its members. SOVAK has considerable influence in the political sector, particularly in the drafting of legislation and co-operation with national and regional authorities and institutions. Approximately a decade later, many problems transpired in areas where the WSS infrastructure was owned by the public sector and operated by private companies, mainly the lack of transparency, long duration of contracts and lack of performance monitoring. Those observations, confirmed by the European Commission, led to a point where further changes were needed. In 2007, the Operational Programme Environment document laid out a common approach to the necessary changes for complying with the European standards and norms, which are continuously fulfilled. The overall strategy of the programme focuses on two priorities in the water sector: water pollution reduction and drinking water quality improvement. The legal WSS framework is defined by two documents, the Water Act and the Act on Water and Wastewater Management. Overall, two major public authorities govern the WSS segment: the Ministry of Agriculture and the Ministry of Finance (officially responsible for the approval of WSS tariffs). There are two main business models: an operational model, under which operators run the infrastructure owned by another entity (usually...
municipalities); and a mixed model, under which one entity both owns and operates the infrastructure. The operational model is highly preferred and recommended by SOVAK as more efficient, since all the costly rehabilitation of the infrastructure remains the responsibility of respective municipalities. Companies that perform under the operational model maintain a dominant position on the market. Two major international companies dominate the WWS market. Veolia Water Czech Republic operates the infrastructure of more than 1,200 municipalities (40% of the market). Another company, Ondeo, supplies water to over 1.2 million customers (15% of market share). In all contracts, the operator pays a lease/rent for the municipally-owned water system in return for an exclusive right to operate it and to collect tariffs from the customers. Czech municipalities are highly fragmented (about 89% of municipalities have a population below 2,000 people). As a result, they often form various inter-municipal co-operation structures such as voluntary municipal associations (VMAs), joint legal entities or so-called micro-regions. In 2008, there were about 800 VMAs. The VMAs enter into contracts with private WSS operators. Another interesting option for organising WSS services is a holding company formed by several municipalities, which manages the WSS infrastructure and enters into a contract with a private WSS operator on their behalf.

In 2012, according to the Czech Statistical Office (CZSO), the WSS sector supplied water to 9.8 million residents in the Czech Republic (93.5% of the population). The quantity of water invoiced was reduced by 0.6% and amounts to 88.1 litres per capita per day. A total of 8.67 million residents, or 82.5% of the population, lived in buildings that were connected to sewerage systems (473 million m³ of wastewater was discharged, 97.1% of which was treated). In 2012, according to CZSO, the average water tariff rate, excluding VAT, amounted to CZK 32.70/m³ (approx. USD 1.59) and the average sanitation charge rate was CZK 29.60/m³ (approx. USD 1.44). Compared to 2011, the water tariff rate has thus increased by 6.2% and the sanitation charge rate by 6.1%. In recent years, a trend towards market consolidation has emerged, and is expected to continue. This process is mainly achieved through regrouping of small companies into a larger one, with a co-operative share with municipalities. However, WSS infrastructure ownership is likely to remain fragmented.

**WSS business models in small towns and rural areas**

The WSS supplies about 83% of residents in rural areas with water, while this rate is 93.5% countrywide. According to the OECD, rural settlements (fewer than 2,000 inhabitants) represent 89.8% of municipalities; in most cases, they form various inter-municipal co-operation structures to jointly provide WSS services in larger territories. Private operators supply water to most rural settlements (about 97%), paying a lease/rent to the municipally-owned water system in return for an exclusive right to operate it and collects tariffs from the customers. Tariff regulation, performed by the Ministry of Finance, is based on the commodity (supplied water), and not the company that provides it. This means that WSS companies do not have full freedom in setting water charges. Regulation applies to the components of the tariff to ensure reasonable costs and profits for the services provided.

**Lesson learned for Kazakhstan:** the WSS sector has a high level of delegation and consolidation, which appears to guarantee an efficient standard of services. Inter-municipal co-operating structures can consolidate the sector, despite the high level of fragmentation. The operating rules and principles for the WSS private companies should be transparent and clear; otherwise, it may exacerbate the lack of performance monitoring and long-term contracts. Entrusting the tariff policy to a governmental body, increases infrastructure efficiency that results in better quality of services.

WSS in small towns and rural areas in Czech Republic benefits from regionalisation through various inter-municipal co-operation structures. It also benefits from strong tariff regulation. The involvement of the private sector has generated a number of problems in the Czech Republic in the past, due to weak preparation of public administration for establishing and monitoring the implementation of contracts with private operators.
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7.5. Case study: WSS development in Finland

A well-functioning WSS management system in Finland

Background

Finland is a Nordic country bordered by Sweden (west), Norway (north), the Russian Federation (east) and Estonia (south, across the Gulf of Finland). The country covers an area of 338,424 km². The population of Finland is about 5.4 million people, with an average population density of about 15.8 inhabitants per km². Finland has developed a modern competitive economy with a gross domestic product based on a purchasing power parity of USD 201.74 bln (GDP PPP per capita USD 37,012) according to the International Monetary Fund (2013). Finland has a mild climate influenced mainly by the Gulf Stream. The total amount of renewable water resources in the country is around 110 km³. Two-thirds of the public water service is groundwater-based.

Political system and administrative-territorial division

Finland is a parliamentary democracy with a multiparty political system; the president is the head of state. The Finnish Parliament is unicameral; it enacts laws, approves state budget, ratifies international treaties and oversees the government. The parliament elects the prime minister, who is the head of the government. Finland, with Helsinki as the capital city, is divided into 19 regions, 70 sub-regions and 320 municipalities, 107 of which are cities with elected local councils. The average municipality population is approximately 16,900 people, and their average area size is 17,812 km². Municipalities are self-governing entities.

WSS sector development

Finnish water and sanitation services are very well developed and have a long tradition. In 1917, when Finland became independent, 16 urban WSS systems were already in operation. Further logical and practical reforms led to a well-organised WSS system. The most important of these reforms was made possible by the Water Act (1962) and the Water Administration Act (1970). In time, with the increasing number of private companies offering their services, the Finnish Water and Waste Water Works Association (FIWA) was established. In 1974, the Wastewater Surcharge Act came into force and allowed municipalities to raise water rates to reflect wastewater treatment obligations. Currently, the Environmental Protection Act (2000) and the Water Services Act (2001), complemented by EU directives, are the most important Finnish regulations in the WSS sector.

The responsibilities of the Finnish authorities in the WSS sector can be classified in three tiers: central, regional and local. At the central level, water management is the task of the Ministry of Agriculture and Forestry (MAF) and the Ministry of the Environment (MOE). These ministries are in charge of environmental and water legislation, policy and strategy development. Under these ministries, the Finnish Environment Institute (FEI) operates as a national advisory body. In addition, the Ministry of Social Affairs and Health (MOSAH) provides guidelines for drinking water quality and the Ministry of Trade and Industry (MTI) regulates economic activity and competition in the WSS sector. At the regional level, WSS providers are monitored and regulated by regional environment centres; they are responsible for water issues on their territory and oversee implementation of national water policy and strategy. On issues related to water resource management and water services, regional environment centres report to the MAF. At the local level, the municipalities are responsible for the provision, overall development and organisation of the WSS services on their territory in accordance with the Water Services Act. WSS service providers are responsible for the delivery of water services, including the construction and maintenance of the infrastructure, as well as the collection and conveyance of storm and drainage water
from the foundations of buildings. Sanitary standards in Finland are relatively high; however, because of long distances between sparsely populated areas and the abundance of water, the percentage of public water service coverage is rather low compared to many other Western European countries. Nonetheless, the number of residents served by public water utilities is continuously increasing. According to the FEI and MAF, about 90% of the population (4.9 million people) are connected to the public water distribution network. The remainder draw their drinking water from individual wells. WSS coverage in densely populated areas is almost 100%. The public sewerage system serves about 4.2 million people, which is about 78% of the population (98% in densely populated areas). The quantity of supplied water amounts to 242 litres per capita per day. Invoices of municipal water utilities combine drinking water and wastewater fees, which are based on water consumption. According to FIWA’s data, the average water and wastewater charge in Finland is € 4.83/m³ (approx. USD 6.57). Larger public water utilities operate on a commercial basis. The operating costs of services and operating expenditures are presently covered by direct customer charges.

**WSS business models in small towns and rural areas**

About 35% of Finland’s population lives outside populated centres. Small towns and rural areas are commonly established as municipalities, with an average population under 21 000 inhabitants. Moreover, almost 0.5 million of rural residents live in houses that are not connected to centralised WSS systems. This situation results from the fact that consumer-managed water co-operatives rather than municipalities are responsible for the WSS sector in rural areas. These co-operatives distribute water to villages, consisting of several farms and houses, or to particular households (approx. 10% of the population). Water co-operatives may be run under two possible models. In the first model, water is purchased from the municipal water networks, and the co-operatives are responsible for investment, operation and maintenance of their own system (network and pumping stations). In the second model, the co-operatives have their own source of water supply and are responsible for water intake and treatment. The municipality of a particular region decides on water and sanitation charges in rural co-operatives, although municipalities are not responsible for WSS services in rural areas. Municipal utilities in small towns and nearly all small rural co-operatives are clearly unprofitable, and municipalities have to support them financially. The Water Services Technology Programme (1997-2001), with a budget of € 11.4 million, positively influenced development in the WSS sector in rural areas and drew attention to the needs of the water sector. This programme aimed to improve the technological competitiveness of water service utilities, increase readiness for new technologies in water and sewerage infrastructure, bring to the market new products designed for WSS needs in rural areas and provide high-quality drinking water.

**Lesson learned for Kazakhstan:** The division of responsibility for WSS services at different administrative tiers seems to have facilitated the high level of WSS service delivery. Each tier (national, local or municipal) is responsible for services at different levels, thanks to a system of checks and balances between all stakeholders and adequate monitoring of WSS services. The public water co-operative system ensures that basic needs and expectations of rural residents are met. Water co-operatives manage WSS in small towns and rural areas in Finland; the model of co-operation with the municipality depends on the source of the water. In any case, municipalities have to support them financially.

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7.6. Case study: WSS development in France

The French model of highly fragmented WSS municipal management and consolidated market of WSS private operators

Background

France is a Western European country bordered by Belgium (north), Luxemburg (northeast), Germany (northeast), Switzerland (east), Italy (southeast), Monaco (southeast), Spain (southwest), Andorra (southwest); the Mediterranean Sea (south); and the English Channel and North Sea (north). The territory of France also includes overseas regions. Metropolitan France (part of France located in Europe) covers an area of 551,695 km². The population is over 63.9 mln people, with an average population density almost equal to 116 inhabitants per km². Around 86% of the French population live in urban areas. In 2013, according to the International Monetary Fund, gross domestic product based on purchasing power parity (GDP PPP) of France was USD 2,289.62 bln (GDP PPP per capita USD 35,941). The north and northwest regions of France have a temperate climate, while in the rest of the country the climate is oceanic, continental or alpine. Total renewable water resources are 211 km³, and 62% of supplied drinking water has its source in groundwater.

Political system and administrative-territorial division

France is a unitary semi-presidential republic with the president as the head of state. The president and the government have executive authority. The French Parliament is composed of two houses, the National Assembly and the Senate. France is divided into 27 regions, 22 located in the European territory and 5 overseas. The regions are subdivided into 101 departments, which are further subdivided into 341 districts. The districts are made up of 4,051 cantons. The cantons are further sub-divided into 36,697 communes, which are municipalities with elected councils. Three communes (Paris, Lyon and Marseille) are subdivided into 45 municipal arrondissements. The regions, departments and communes are all known as territorial collectivities.

WSS sector development

The first comprehensive water policy in France (Water Act of 1964) established the organisational and structural basis for the WSS sector. Six hydrographical basins representing major river basins were designated as main water management territories, and six Water Agencies and Basin Committees were established and are still functioning. Basin committees provide a democratic basis for debate and consultation including on allocation of earmarked funds for water sector development (see below). The legal framework for water resources management and WSS services is established at the national level and consists of two main laws: the Water Law (1992) and the Water and Aquatic Environment Law (2006). The Water Law introduced water management plans at the basin and sub-basin levels as a basis for further development and established rules for setting tariffs, licensing and public participation. The Water and Aquatic Environment Law transposes the European Water Framework Directive and applies the principle of cost recovery in WSS services. In addition, there are several laws intended to improve transparency and public procurement, as well as the European Union Directives that set standards for drinking water quality and wastewater discharge. At the national level, the Ministry of Ecology, Energy, Sustainable Development and Territorial Planning (responsible for environmental regulation), the Ministry of Health (monitoring drinking water quality), the Ministry of Interior (supervising local government) and the Ministry of Economy and Finance (supervising water agencies) together with the Ministry of Ecology have a role in determining policies for WSS.
The provision of WSS services is the responsibility of communes, which have an average population of 1,500 people. This results in high fragmentation of the WSS sector. Small communes establish associations to benefit from economies of scale. In 2008, there were approximately 16,000 associations in France. Almost 12,000 were SIVUs – legal structures that link two or more communes for a single purpose. The WSS service is provided under two possible models: direct public management (where public authorities own and manage service delivery) and delegated private management (where private companies perform service operations and monitoring; assets are still owned by the municipality). Communes and associations often contract out WSS services to the private sector (about 80% of cases) through delegation contracts; selling WSS infrastructure assets is legally prohibited.

Four types of contracts are used in the delegation of WSS services: concession, lease (affermage), management contract (gérance) and commissioner management contract (régieinteressée). Concession and lease contracts are by far the most common. The market of WSS private operators is strongly consolidated with four major private companies: VEOLIA Environment, SUEZ Environment, Bouygues and SAUR. There is no national regulatory agency that approves tariffs and controls service standards. Recently there has been a discussion on re-municipalisation of WSS services in France; Paris, for example, decided not to renew contracts with private operators.

In France, about 99% of the population have access to centralised water supply with continuous service. The percentage of sanitation coverage is lower, approximately 82%. However, households not connected to centralised sanitation systems are equipped with septic tanks that are regularly controlled and monitored to ensure compliance with respective environmental standards. Average water use equals to 165 litres per capita per day. The infrastructure of water supply systems is characterised by high prices of metered water and by a relatively high percentage of water losses (26%). In 2007, the average water tariff was equivalent of USD 1.58/m³, and the combined water and sanitation tariff in the five largest cities in France was about USD 3.99/m³.

**WSS business models in small towns and rural areas**

The provision of water and sanitation services is an enormous task for many rural communes, which lack the resources and expertise to do it on their own. Accordingly, several communes usually work together to deliver WSS services through bodies called Syndicat d’Eau. The Syndicat may manage water supply directly (20% of cases) or contract it out to a private company (80% of cases) such as Veolia, Suez-Lyonnaise des Eaux or Saur. Together, large private companies control 98% of the WSS market, leaving just 2% of the market for small private operators. The Syndicat or a private operator may manage both water supply and sanitation services, or there may be separate arrangements for water and sanitation. Thus, while a commune may work on an inter-municipal basis for the water supply, it may manage sanitation services on its own. While coverage by centralised water supply system is quite high, there are still around 5 mln households that use on-spot sanitation (septic tanks). At the same time, there are about 15,500 treatment plants; 6,000 of them are of a size less than 2,000 population equivalents and are often equipped with extensive treatment processes. Despite high WSS coverage, the government intends to continue its efforts to improve WSS services in rural areas, especially in ecologically vulnerable zones. Rural areas benefited in the past from the National Water Supply Development Fund (FNDAE), a national solidarity fund that distributed the national tax collected from each m³ of water between rural communes to ensure the provision of WSS services. The FNDAE disappeared in 2005, and a similar tax levied by the six Water Agencies – the Tax on Water Consumption – replaced the FNDAE tax. In this way, rural areas may benefit from this solidarity mechanism at basin level.

**Lesson learned for Kazakhstan:** The high fragmentation in the sector does not seem to be an ideal WSS organisational model, even despite very high WSS population coverage. The need to gather a few communes into one bigger association confirms the need of partial centralisation. Small municipalities may
not be as cost effective as bigger ones. Completely handing over responsibility for service to private organisations means potentially less influence on their actions and effectiveness.

The French legal system of inter-municipal co-operation in WSS is very well developed. Municipalities may choose among several types of co-operation, all them well grounded in the French legal system. France used a public-private partnership model very widely, while recently it turned towards public provision of services.

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7.7. Case study: WSS development in Georgia

Consolidating WSS service delivery at the regional level and gradually extending the delivery of WSS services from urban to rural areas in Georgia

Background

Located in the Caucasus region of Eurasia, Georgia is bordered by the Russian Federation (north), Turkey and Armenia (south), Azerbaijan (southeast) and by the Black Sea (west). The country covers an area of 69,700 km². The population is 4.9 million people with average population density around 70 inhabitants per km². In 2013, the gross domestic product based on purchasing power parity was USD 28.73 billion (GDP PPP per capita of USD 6,356) according to the International Monetary Fund. The Georgian climate is extremely diverse. The total amount of renewable water resources is around 63 km³. Groundwater is a source for 90% of water consumption.

Political system and administrative-territorial division

Georgia is a democratic semi-presidential republic. The executive branch consists of the president, as the head of state, and the government. The legislative authority is vested in the unicameral parliament. By the Constitution of Georgia, the country is divided into nine regions, one city (Tbilisi – the capital) and two autonomous republics: Abkhazia and Adjaria. The regions of Georgia are subdivided into 67 municipalities and 5 cities with local governments (Batumi, Kutaisi, Poti, Rustavi and Tskhinvali). The average area of a region is 6,476 km², and the average population is approx. 326,000 people. Almost half of the population live in rural areas.

WSS sector development

The situation in the water supply and sanitation sector is extremely complicated. Most of the WSS systems are in critical condition due to anthropogenic contamination, low sanitary standards and a difficult economic situation. The latter explains the fact that many water consumers cannot pay for water supply services and sewage disposal. Moreover, 60% of water pipes and half of the sewage collectors are fully depreciated, which results in poor water quality and significant water losses (40%). At present, water legislation is based on the Constitution, the Law on Environment Protection (1996) and the Law on Water (1997), as well as numerous ratified international agreements. The Law on Environment Protection establishes the main principles of natural resources management, including water. According to the Law on Water, water is the property of the state, and its use is permitted by several types of licences (for water diversion, use and release). The Georgian National Energy and Water Supply Regulatory Commission (GNERC) is a legal entity with the specific authority to regulate energy and water supply sectors. The commission is independent from state authorities and is not financed from the state budget. The main share of the commission’s budget is financed from regulation fees. The commission sets the water and wastewater tariffs and regulates relations between service providers and customers. The Ministry of Regional Development develops a national policy in the WSS sector to ensure sustainable services to the population, but the State Commission on Water Supply and Energy provides policy direction. The Ministry of Regional Development represents the state ownership of regional water. After reorganisation of the WSS sector, three water utilities currently provide the services: the Georgia Water and Power Company (GWPC), which services Tbilisi and Rustavi (31.8% of the country's population); the Batumi Water Company and Adjarian local authorities, which service the Adjaria Autonomous Region (8.6% of the country’s population); and the United Water Supply Company of Georgia LLC (UWSCG), which services the rest of the country (58.5% of the country’s population). The UWSCG was established in 2010 as a subsidiary of the LEPL Water Supply Regional Development Agency eliminating two regional water utilities, West and East Water LLCs. The UWSCG has three organisational tiers: the central office,
6 regional branches and 53 service centres. The financial management of the company requires improvement because of low revenue; a government subsidy is necessary to cover its costs. At the same time, levels of non-revenue water are estimated at 30%.

The OECD Environmental Action Programme (EAP) Task Force claims that, in the three biggest cities of Georgia (Tbilisi, Rustavi and Kutaisi), centralised water supply systems service close to 99% of the population, while in other cities this percentage varies from 15 to 90 (the bigger the city, the higher the percentage). On average, 70% of the urban population is served by the WSS sector. The water supply system is characterised by extremely high average daily use; in Tbilisi, for example, water use is estimated at more than 740 litres per capita per day. In other cities, daily consumption is also very high. Tbilisi is one of very few places in Georgia where supplied water is available 24 hours a day. The average continuity of water supply for larger cities is 13 hours, but some settlements have only 4 hours. In Tbilisi, the share of the population connected to the centralised sewerage system is estimated at 96%, in Rustavi at 68% and in Kutaisi at 74%. The average price of potable water per m$^3$ for metered domestic customers is GEL 0.27 (approx. USD 0.15).

**WSS business models in small towns and rural areas**

There is a great disproportion between WSS services in urban and rural areas in Georgia. Small towns and rural settlements are defined as those with fewer than 5,000 people. Residents of these areas draw water directly from wells or surface resources without any treatment. It is estimated that only 51% of rural residents have access to improved water resources, not to mention piped water. Responding to the need for improvement, the government adopted the Rural Support Programme. Approximately 7,000 projects will be financed, with the total cost of GEL 49,993,821 (USD 28,355,347). At the same time, the government is co-operating with the Asian Development Bank (ADB) and European Investment Bank (EIB) on rehabilitating the WSS sector in regional centres, secondary cities and towns across the country. One example is the Urban Services Improvement Programme financed from the USD 500 mln ADB loan, provided for 2011-19 to rehabilitate the WSS sector in six secondary cities. Another example is the Water Infrastructure Modernisation Project financed by the EIB, which loaned EUR 40 mln for 2011-13 to partially rehabilitate WSS systems in 26 municipal centres. Although the government does implement rural support programmes, it still gives priority to developing the WSS in urban areas within the framework of the United Water Supply Company of Georgia. People in rural areas not adjacent to municipal centres still have to rely on individual self-supplying systems and on assistance from the State Rural Support Programme to develop small-scale WSS systems under the community management model.

**Lesson learned for Kazakhstan:** The multitude of managing bodies in the WSS sector has led to lack of transparency and complex management rules, resulting in inefficient WSS services. An external WSS organisation parallel to the government caused problems, including the lack of a common WSS strategy, an independent tariff policy and reduced governmental influence on the WSS sector. Combined with the poor state of the WSS infrastructure, this situation does not guarantee an appropriate level of WSS services. Similarly to other countries, community-based organisations manage Georgian small-scale WSS systems.
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7.8. Case study: WSS development in Great Britain

Privatised WSS sector in England and Wales

Background

The United Kingdom of Great Britain and Northern Ireland is a sovereign state located off the north-western coast of Europe. It includes the island of Great Britain (England, Scotland and Wales), the north-eastern part of the island of Ireland and many smaller islands. The United Kingdom covers an area of 243,610 km$^2$. The population is 63.2 mln people, with an average density of around 259 inhabitants per km$^2$. In 2013, according to the International Monetary Fund, gross domestic product based on purchasing power parity was USD 2,391.04 billion (GDP PPP per capita of USD 37,501.7). The United Kingdom has a temperate climate. The overall volume of renewable water resources is around 147 km$^3$. Two-thirds of the drinking water supplied comes from surface water resources.

Political system and administrative-territorial division

The United Kingdom is a unitary state under a constitutional monarchy with a parliamentary system. The government is led by the prime minister, who appoints all the remaining ministers. The cabinet is a supreme decision-making committee. The government is dependent on the parliament to draft primary legislation. The United Kingdom consists of four countries. England is divided into nine regions, and further subdivided into 83 counties and 326 districts. The average district population is 193,000 inhabitants, and the average district area is 747 km$^2$. Scotland is divided into 32 council areas (166,050 inhabitants, 2,450 km$^2$). The government of Wales consists of 22 unitary authorities (139,250 inhabitants, 945 km$^2$). Northern Ireland is organised into 26 district councils (69,650 inhabitants, 532 km$^2$).

WSS sector development

Currently, the public water supply and sanitation in the United Kingdom is characterised by high service quality and universal access.

In England and Wales, starting in the late nineteenth century, WSS services were taken over by local authorities (local government service provision). At that time, the WSS sector was highly fragmented; before the 1950s, there were over 1,000 water utilities, a number subsequently reduced to 198 through gradual consolidation. Of the 198 water utilities, 64 were owned by local governments, 101 were owned by joint boards composed of several local government authorities and 33 were private. In 1974, in accordance with the Water Act (1973), the WSS service framework was reorganised by creating 10 unitary regional water authorities (RWAs), each covering a river basin area. RWAs, appointed by the government, were responsible for the WSS sector throughout the area.

The reorganisation process did not involve private statutory water companies (providing water to 25% of the population). After 1979, the WSS sector remained public, but the government attempted to make WSS utilities more profitable. As a part of the commercialisation attempt, in accordance with the Water Act (1983), the number of members on the boards of regional water authorities was reduced. This centralisation the WSS sector by eliminating local government representation on the boards.

The next step in WSS development was privatisation. The public sector retained authorities for the WSS, while newly floated companies became owners of the entire water and sewage systems and of the properties of the RWAs. The Water Act (1988) gave these companies a 25-year concession in the WSS...
sector (with the exception of the 25% covered by existing small private companies) and protected against any possibility of competition.

The privatisation process created three regulators: the Drinking Water Inspectorate (DWI), which monitors water quality; the National Rivers Authority (now the Environment Agency, or EA), which monitors river and environmental pollution; and the Water Services Regulation Authority (OFWAT), which became responsible for ensuring that companies are profitable. OFWAT also ensured the companies compared performances through a benchmarking peer review to ensure they did not abuse their monopoly position. Water tariffs are based on five-year business plans. The Water Industry Act (1999) banned disconnection of WSS services for non-payment by domestic customers. It also allows the continuation of water charges based on rateable property value. Currently, in England and Wales, a few private companies operating on a large scale provide WSS services; 10 of them are responsible for both water and sanitation services, while 13 (mostly smaller) supply only water.

In Scotland, 12 local authorities (Regional and Island Councils) were previously responsible for WSS, with assets owned by local governments. In the early 1990s, the UK government merged regional and island councils into three regional public service providers to prepare for the transition to privatisation. However, the proposal was defeated in the Strathclyde water referendum in 1994. In 2002, the Scottish Parliament passed the Water Industry Act, which merged three providers into a single one: Scottish Water. In 2005, according to the Water Services Act, competition for “retail” services (defined as metering, billing and customer services) was allowed. Nevertheless, wholesale WSS services remain a public monopoly. The Water Industry Commission for Scotland is the economic regulator, which independently sets the cost of services at the lowest overall reasonable cost. The environmental regulator is the Scottish Environment Protection Agency, while the EU determines drinking water standards.

In Northern Ireland, prior to 1973, WSS services were the responsibility of local councils, with the exception of the capital city, Belfast, where Belfast Water Commissioners were in charge. In 1973, the responsibility was transferred to the Department of the Environment, namely to the Water Executive (assuring management and administration of the WSS). In 1996, the Water Executive became an executive agency and was rebranded as Northern Ireland Water Service. Since 1999, responsibility for water was transferred to the Department for Regional Development. Currently, Northern Ireland’s WSS system is characterised by old infrastructure and significant water losses.

Generally, the WSS sector in the United Kingdom is characterised by close to 100% population coverage; sanitation services reach approximately 97% of the population both in urban and rural areas. The biggest problem in the country is the low share of metering, with only 40% of bills calculated on a volumetric basis. The average urban water use is close to 150 litres per capita per day. According to OFWAT, for 2010-15, the average cost of water in England and Wales is approximately USD 1.9/m³, and it is systematically increasing every five years. Prices in Scotland are much lower, but still among the highest in the world.

WSS business models in small towns and rural areas

There is no significant difference between urban and rural areas in the United Kingdom in WSS access. One of the reasons for this is the very high population density, which is ranked 53rd of 241 countries in the world. A high percentage of the population is supplied with WSS services, as well as a common regulatory and legislative framework, enabling small towns and rural settlements to benefit from urban areas. In England and Wales, private regional water utilities provide WSS services. Metered prices are uniform in the entire service area, while the price based on rateable value of property depends on the zone. Improving infrastructure, not only in small towns and rural areas, but also in the entire United Kingdom, could reduce water losses. However, successive tariff increases might be necessary.
Lesson learned for Kazakhstan: Extremely different WSS models can be equally efficient. A high privatisation level, adequately regulated by the government, can guarantee cost-effective services with a clear tariff policy. On the other hand, the governmental monopoly in a WSS sector assures equal terms for the whole country and no differences between regions. However, even in similar geographical conditions, the same models do not guarantee the same level of WSS development.

The case of the United Kingdom shows that regionalisation of WSS services is a long process and requires the impetus of the central government. Also strong regulation (including tariff setting and benchmarking) is a prerequisite for private sector involvement.

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7.9. Case study: WSS development in Italy

Continued reform of WSS regionalisation in Italy

Background

Italy is a country in southern Europe bordered by France, Switzerland, Austria and Slovenia in the north, and the Italian Peninsula and the islands of Sicily and Sardinia to the south. The country covers an area of 301 338 km². The population is about 59.6 mln people, with an average density of almost 198 inhabitants per km². In 2013, according to the International Monetary Fund, gross domestic product based on purchasing power parity of Italy was USD 1 835.66 billion (GDP PPP per capita of USD 30 094). The climate of Italy is highly diverse. The volume of renewable water resources is around 191.3 km³.

Political system and administrative-territorial division

The Italian Republic is a unitary country with a parliamentary representative democracy and the president as the head of state. The bicameral parliament consists of the Chamber of Deputies and the Senate. At the national level, the central government is the highest tier of the executive power. Italy is divided into 20 regions. Five of these regions have special autonomous status, enabling their legislature to decide on some local matters. The average area of regions is 15 066 km². Regions are further subdivided into 110 provinces and 8 100 municipalities. Each municipality, with an average population of 7 358 people, is headed by a mayor and assisted by the legislative and the executive body. There are also 15 metropolitan cities.

WSS sector development

The Italian water supply and sanitation situation is very complex. Access to water has some evident deficiencies due to long seasonal periods of drought and inefficient water resources management. The main obstacles to the WSS sector result from the fragmentation of legal competences and institutional responsibilities, as well as insufficient co-ordination between all the involved participants. In addition, the average person consumes a high quantity of drinking water and a significant percentage of water is lost to leakage in water networks, which are 30 years-old.

Up until the mid-1990s, the Italian WSS service sector was largely fragmented and run by over 8 000 utilities. Poor efficiency, poor management and inadequate financial sustainability were the main drawbacks of the system. All these issues were of significant concern during the implementation of the EU legislation. In 1994, the Italian Parliament approved a water sector reform through the enactment of the Galli Law, named after its proponent. The reform stressed two main aspects. First, water was recognised as a public good and as a resource, which must be protected and used according to the criteria of solidarity. Second, it recognised the need to make the organisational framework less fragmented.

This centralised approach was based on Optimal Territorial Areas (ATO), which designated new territories for WSS services, and on the application of integrated water resource management in these new service areas: 91 ATOs were created, each servicing an average population of 616 000 inhabitants on an average territory of 3 162 km². Each ATO set its own unified water tariff. The reform established different levels of responsibility for WSS services. At the national level, the Committee for Control and Use of Water Resources (COVIRI) became responsible for the comprehensive supervision of the WSS sector following government guidelines. At the regional level, regional and basin authorities became responsible for environmental regulation and infrastructure development in the basin areas; WSS services were transferred from the municipal to the regional level. The regions obtained general decision-making power for establishing ATOs and for allowing participation of the private sector on their territory. Operation of the WSS services could be public, mixed or private.
Finally, at the “sub-basin” level, municipalities retained ownership of the infrastructure and appointed ATO authorities, which were in charge of economic regulation, performance monitoring and control over fulfilment of obligations. Although privatisation was not mandatory, many municipalities converted WSS operations from the public to private sector, transforming special public agencies into private companies or into consortia. The Galli reform led to the centralisation of water management, although it was not without disadvantages. The main problems arising from reform were i) inefficiency in the regulation of private companies; ii) lack of public participation in establishing standards of service delivery; iii) dangerous formation of oligopolies in public services; and iv) institutional weaknesses in regional agencies. In 2006, the Environmental Code repealed the Galli Law, but the main legal framework for WSS services in Italy is still based on a substantial portion of that law. Another reform took place in 2011, with the major objective to create a new National Water Authority with an independent regulatory power (AEEG). The main role of AEEG is to provide incentives for investment, both to increase efficiency of WSS services and to set a new tariff system. According to this reform, although it is not fully operational, ATOs in their previous form and role shall disappear, and basin areas shall be governed by basin councils.

Despite the above legal and regulatory problems, Italy has a relatively high percentage of WSS coverage. The Italian Statistical Office estimates that 97% of the population has access to water supplied by the WSS sector. However, that picture can be misleading, and Italy still faces major problems. Over 10% of WSS customers complain about intermittency in water distribution (approx. 30% of the population in the south). Average consumption of water equals to 183 litres per capita per day (lcd), while water losses amount to 32% (120 lcd) and exceed 40% in the south. Approximately one-third of the population reports feeling unsafe with drinking tap water, and this percentage goes up to 60% in Sicily and 50% in the overall south of the country. The average charge for water is €1.46 /m³ (approx. USD 1.99/m³). The average coverage of sanitation systems is 86%, with maximum coverage in Rome (the capital city), 98%. The average age of the sewerage systems in Italy is 27 years.

WSS business models in small towns and rural areas

The situation in the WSS sector in Italy overall, and in small towns and rural settlements, is relatively good. Only 31% of the population (approx. 18.5 mln people) live in rural areas, where water supply coverage is 94%; sewerage systems coverage is at least 33%, with average value of 80%. Although improvements are always possible, these numbers suggest that residents not connected to the networks are most likely living in “spread houses” and the connection may be worthwhile. Residents not connected to water supply systems draw water from individual wells. After the introduction of the Galli Law, small towns and rural areas were included in the ATOs which share common policy and WSS tariffs with urban areas in the same “basin”. Small towns and rural settlements benefit from these situations due to the equalisation principle, which requires elimination of differences between urban and rural areas.

Lesson learned for Kazakhstan: Recentralisation of the WSS sector is not easy. The significant fragmentation of the sector may cause an inefficient level of services, which often suggests the need to centralise activities. However, reducing the number of WSS operators by consolidating them into a few bigger operators may also create conflicts of interest for some companies. The complexity of the situation was also linked to the simultaneous change of WSS basins covering different areas. Italy went through a long process of WSS sector regionalisation; while some small towns and rural areas benefited from this, the lack of strong regulation caused a lot of implementation problems.
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7.10. Case study: WSS development in Kyrgyzstan

WSS management under decentralised public administration in Kyrgyzstan

Background

Kyrgyzstan (Kyrgyz Republic) is a landlocked country in the northeast of Central Asia bordered by Kazakhstan (north), Uzbekistan (west), Tajikistan (south) and the People’s Republic of China (east). The country covers an area of 199,951 km². The population of Kyrgyzstan is about 5.6 million people, with an average population density of about 28 inhabitants per km². In 2013, according to the International Monetary Fund, gross domestic product based on purchasing power parity of the Kyrgyz Republic was USD 14.49 bln (GDP PPP per capita USD 2,568). The climate of Kyrgyzstan is very continental and arid in most of the country. Total volume of renewable water resources is around 23.62 km³. About 85% of water supply systems in the Kyrgyz Republic use groundwater.

Political system and administrative-territorial division

Kyrgyzstan is a unitary state with parliamentary representative democracy and the president as the head of state. The prime minister is the head of the government, which acts as the executive body together with the president. Legislative power is vested in both the government and the parliament. Kyrgyzstan is divided into seven provinces (oblasts) administered by appointed governors. The capital city, Bishkek, and the second largest city, Osh, are administratively independent cities with a status equal to a province. The average area of a province is 28,564 km². Provinces are further subdivided into 40 districts (administered by government-appointed officials) and 25 cities. Water supply and sanitation services are the responsibility of the local government in 25 urban and 459 rural municipalities.

WSS sector development

After gaining independence, the Kyrgyz Republic developed and adopted appropriate laws and subordinate legal documents for the water supply and sanitation sector. Some of these legal acts are the Law on Water, the Law on Potable Water and the Water Code, which are the basic laws regulating water relationships. At the national level, the Department of Drinking Water Supply and Sanitation of the State Agency for Architecture, Construction, and Housing and Communal Services of the Kyrgyz Republic is responsible for the WSS sector. The decentralisation of responsibility for WSS services and their delegation to local authorities created a number of problems. Currently, more than 1,050 centralised domestic systems supply drinking water to the population, 133 of which use surface water as a source. Due to insufficient local budgets, low local capacity in WSS infrastructure management and low tariffs, the financial situation of the operators is generally poor. Virtually all of them, except for Bishkek Water Supplying Enterprise, have been unprofitable over the last decade, and the quality of services has been declining. Tariff policy is politicised: provincial governors and city mayors prefer not to raise the tariffs to avoid provoking people’s discontent with the local and national government. Significant participation of the private sector in the maintenance and development of the WSS systems is not expected; so far there has been only one private operator – in Kant city. In rural areas, the local population contributes to rehabilitation of water infrastructure through cash contributions (5% of total cost) and labour (equivalent to 15% of total cost) under the “Taza-Suu” (Clean Water) programme.

High losses (20-55%) in water networks occur as a result of the infrastructure’s poor condition. Most of the existing water supply systems require capital repairs; 40% are beyond their depreciable life and are out of order; 261 water supply systems fail to comply with sanitary requirements; and over 4,000 standpipes are out of order. In principle, according to the Drinking Water Law, whenever a new residential area is set up the government is obliged to build a water supply system and put it into operation.
within three years to ensure uninterrupted water supply to the population. In practice, however, water supply is delayed over extended periods. Land reform has been causing problems of compliance with restrictions in the sanitary protective zones around water sources. In most cases, individual sources are not protected or properly equipped. There is also a growing need for the training of technical personnel for operating water utilities.

In 2011, 92.4% of the republic’s population had access to piped drinking water. In the city of Bishkek, water supply systems serve the entire population. However, there has been a downward trend in access to safe drinking water in the region – in some cases, the rate of coverage has declined by as much as 10%. Average water consumption varies from 50 to 125 litres per person per day. The average continuity of water supply is 16 hours per day in urban areas. The charge for 1 m³ of water is relatively low and varies between USD 0.02-0.24/m³, with an average payment collection rate close to 65%. Unlike access to clean drinking water, improving the population’s access to sanitation has been a more difficult task. Accomplishments in this area have been quite modest; from 2006-11, the share of the population with access to sanitation increased by just 1.5% to approximately 26%. Improvement in access to sanitation is a challenge not only in rural, but also in urban areas. Around 40% of the 350 wastewater treatment plants fail to ensure treatment up to the standards in place. Difficulties related to increasing access to sanitation are caused mostly by economic reasons, but cultural and social issues as well.

In recent years, many international programmes were implemented in Kyrgyzstan. The Asian Development Bank (ADB) financed the Provision of Infrastructure Services in Settlements Project to rehabilitate and construct water supply systems in 730 villages and 7 towns, covering about 2 mln people. The Rural Water Supply and Sanitation Project of the World Bank, implemented in 2002-07, had similar goals in 270 villages. Since the government co-financed the project, their total amount reached about USD 70 mln. To support implementation in the northern areas of the country, the British government jointly with the World Bank allocated an additional grant of USD 4.4 mln for a sanitation and hygiene programme.

**WSS business models in small towns and rural areas**

The issue of clean drinking water supply and improving sanitary conditions in rural areas is a national priority in Kyrgyzstan. According to official data, there are 1 805 villages in the country, of which 725 (40%) have no adequate access to the centralised drinking water supply, and 396 (22%) have no water supply systems at all; their population relies on open water sources. The dominant model of WSS operators are community-based organisations (CBOs) and local water utilities in small towns. The average continuity of water supply services in rural areas is six hours per day. Since the majority of the country’s population live in rural areas, the general description of WSS services in Kyrgyzstan is more relevant to these settlements rather than urban areas.

**Lesson learned for Kazakhstan:** high fragmentation in the sector may lead to an over-abundance of small, financially ineffective and unprofitable WSS companies. Political considerations can also influence tariff policy. The low involvement of the private sector contributes to stagnation of the WSS sector and deepens its main problems, such as lack of funds for infrastructure replacement and repair.

Similarly to other countries of the Caucasus, CBOs manage small-scale WSS systems.
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7.11. Case study: WSS development in Poland

Successful delivery of WSS services by municipal water utilities mainly operated under commercial law in Poland

Background

The Republic of Poland is a country in Central Europe bordered by Germany (west), Czech Republic (south), Slovakia (south), Ukraine (east), Belarus (east), Lithuania (northeast), Kaliningrad Oblast (north) and the Baltic Sea (north). The country covers an area of 312,679 km². The population is about 38.5 mln people, with average population density of about 123 inhabitants per km². In 2013, according to the International Monetary Fund, gross domestic product based on purchasing power parity of Poland was USD 824.78 bln (GDP PPP per capita of USD 21,005). The climate of Poland is mostly temperate. The volume of renewable water resources is around 61.6 km³.

Political system and administrative-territorial division

Poland is a unitary parliamentary democratic republic with the president as the head of state. The highest tier of executive power is the Council of Ministers. Legislative power is vested in both the government and the bicameral parliament, consisting of the Lower House and the Senate. The judiciary branches are independent. Poland is divided into 16 voivodeships, which are further subdivided into 379 counties and 2,479 municipalities. Major cities normally have a status of both a municipality and a county. Average population of a municipality is around 15,000 people, and average territory is approximately 126 km².

WSS sector development

Underinvestment during the communist regime left Polish WSS infrastructure in poor condition, which resulted in bad quality of water and operational problems. Today, 20 years later, the sector is sound and continuously developing. However, some issues persist, such as the recontamination of water, ageing pipes, pressure destabilisation and disproportion between water and sewerage networks.

In 2000-01, Poland passed a series of environmental acts amending or replacing laws from the 1970s and 1980s. Currently, the main legal act regulating the provision of WSS services is the Law on Water Supply and Wastewater Collection (2001). The Ministry of Health regulates the monitoring of drinking water quality, and the Ministry of Environmental Protection monitors wastewater treatment. According to the Law on Municipal Self-government (1990), municipalities provide drinking water and sewerage services within their territory. The law empowers municipalities to organise the provision of WSS services on their territory, which can take the form of a municipally-owned corporation or a budgetary enterprise. The municipality may also sign a contract with an external provider or enter into public-private partnership arrangements; this is still rather rare in Poland. Additional options include inter-municipal co-operation, which transfers responsibility for WSS services to another municipality, or forming an association with other municipalities. The most common model for provision of WSS services is a corporation fully owned by the munipality (usually a limited liability company). Budgetary enterprises usually operate in small towns and rural municipalities. In towns, the most common legal form of a water utility is a limited liability company, while in the largest cities, joint stock companies are more frequently used. Public-private service provision is quite rare; the best-known examples are Gdansk Saur Neptun and “Aqua” Bielsko Biala.
In 2012, there were 1,793 water utilities, which is lower than the number of municipal-level local government units. The average water utility provides services for about 1.5 local government units (approximately 22,500 people).

The municipality adopts and controls the implementation of local regulations on water supply and sewerage services, which stipulate the rights and obligations of the water utility and its customers. In addition, it can issue a licence for a water utility operating on its territory. A specific contract between the parties governs the relationship between the water utility and its customers. According to the 2001 law, the municipal council approves water and wastewater tariffs. However, if a tariff is fully in line with the methodology required by law, it may come into force even if the local council did not adopt the required resolution. In 2010, almost half (46%) of the capital investment for environmental protection was financed from primary sources. This includes financing by water utilities (about 60%), municipalities (40%), foreign sources (mostly EU funds) (19%), Polish environmental funds (18%) and credit and loans (10%). Since 2004, as a member of the EU, Poland has been required to implement EU directives. This includes the Urban Waste Water Directive, which requires proper treatment of wastewater in agglomerations with population equivalent or superior to 2,000 residents. To comply with the directive, the government adopted the Country Wastewater Programme that developed plans to build the necessary sewerage infrastructure. The directive also defines the agglomeration as an area where population and/or economic activities are sufficiently concentrated for urban wastewater to be collected and conducted to an urban wastewater treatment plant. In Poland, the term “sufficiently concentrated” is defined as 120 people for every kilometre of sewerage pipes. The Country Wastewater Programme is financed from different sources, with a significant portion coming from EU funds.

In urban areas, both water supply and sewerage network coverage is almost 100%, while in rural areas this indicator is lower. In 2012, according to the Statistical Yearbook, the WSS sector supplied water to 96.5% of the population (37.15 mln people). Average water consumption in urban areas was around 95 litres per capita per day. The coverage of sewerage networks reaches 87% of the population countrywide (33.5 mln people). In 2012, the average water tariff rate, excluding VAT, amounted to PLN 3.67/m³ (approx. USD 1.17), and the average sanitation tariff rate to PLN 6.27/m³ (approx. USD 2.01). According to the Statistical Yearbook, the combined tariff rate for water and wastewater increased by 11.7% between 2011-12.

**WSS business models in small towns and rural areas**

Of the 40% of the population living in rural areas, only 77% are connected to centralised water systems, and only 30% have access to sewerage services. The difference in the development of water and sewerage networks in rural areas varies by region from 50% to 65%. Although investments in the WSS systems doubled between 2000-10, the disparity in the development of sewerage systems in rural areas is still very large. In rural areas without centralised WSS systems, people use individual wells and septic tanks. In this case, they are legally obliged to contract a service for transporting the sewage to a wastewater treatment plant.

In Poland, a typical rural or semi-rural municipality consists of a town, which is the centre of the municipality, and surrounding villages. The WSS infrastructure is composed of several separate systems operated by the municipal water utility. In searching for economies of scale, a recent trend has been to link systems together, thereby extending the WSS systems of small towns to surrounding villages. This situation is driven by the criteria for selecting WSS infrastructure projects for financing by EU structural funds. The larger scale of WSS systems leads to various forms of inter-municipal co-operation. Water utilities use uniform tariffs for all customers, even if they are serviced by different systems. However, there are also cases where the water tariffs are different.
**Lesson learned for Kazakhstan:** a high level of fragmentation in the WSS sector may also result in an effective level of services and profitable WSS companies. This can be accomplished by adequate WSS sector monitoring, fulfilling international standards and by responding to residents’ needs and expectations. Adequate development and O&M of WSS infrastructure is reflected in good quality water delivered to consumers. However, this does not completely eliminate the problem of secondary contamination of water, which can be worse than the WSS sector’s estimate.

Polish small towns and rural areas benefit from a larger scale of municipalities than in many other countries, often similar in size to the rayons in some countries. In addition, there is some voluntary regionalisation, well grounded in the Polish legal system. On the other hand, voluntary regionalisation is very slow, which means no further significant progress will occur without government intervention. Furthermore, multi-purpose utilities are common in small Polish municipalities, which help lower the unit costs of maintenance and administration for WSS services. Poland even has some good examples of private sector participation, though in general it is reluctant to involve the private sector in WSS services.

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Reshaping WSS management in Russian Federation

Background

The Russian Federation is a country in northern Eurasia, bordered from northwest to southwest by Norway, Finland, Estonia, Latvia, Lithuania, Poland, Belarus, Ukraine, Georgia, Azerbaijan, Kazakhstan, the People’s Republic of China, Mongolia, and North Korea. It shares maritime borders with Japan (by the Sea of Okhotsk) and the U.S. state of Alaska (across the Bering Strait). The country covers an area of 17 098 242 km². The population of the Russian Federation is 143.7 mln people, with average population density of about eight inhabitants per km². Approximately 74% of the Russian population live in urban areas. In 2013, according to the International Monetary Fund, gross domestic product based on purchasing power parity was USD 2 640.74 bln (GDP PPP per capita of USD 18 671). The climate is humid and continental in most of the country. The total amount of renewable water resources of the Russian Federation is 4 508 km³. Approximately 70% of drinking water supply comes from surface water.

Political system and administrative-territorial division

The Russian Federation is a federal semi-presidential republic with the president as the head of state and the prime minister as head of the government. It is fundamentally structured as a representative democracy, with the federal government composed of three branches: legislative, executive and judiciary. The legislative branch is the bicameral Federal Assembly of Russia, made up of the State Duma and Federation Council. The Russian Federation consists of 83 federal subjects. These subjects differ in the degree of autonomy, but have equal representation in the Federation Council. Federal subjects are grouped into eight federal districts, each administered by an envoy appointed by the president. Unlike the federal subjects, the federal districts are not a sub-national level of government, but are administered by the federal government. There are six types of subjects of federation: 46 oblasts (provinces), 21 republics, 9 territories, 4 autonomous districts, 2 federal cities and 1 autonomous oblast. Two federal cities (Moscow and St. Petersburg) function as separate regions. There are 1 097 cities (15 of them have over 1 million inhabitants), 1 286 urban settlements, and 153 124 rural settlements (including almost 20 000 abandoned settlements).

WSS sector development

The Russian Federation is facing considerable difficulties in solving problems associated with integrated and safe WSS management. The infrastructure of water supply systems is obsolete; the rates of investment and implementation of new technologies have not kept up with the breakdown of key assets. Reforms carried out in the WSS sector are not sufficient for its needs. In 1995, the government significantly improved the Water Code, a key document regulating the water sector. It was amended again in 2005 to include regulatory norms for the use, recovery and protection of water sources. The Code sets out basic principles for establishing water source agreements and water consumption fees. It also broadens the ownership of water sources by allowing private ownership in isolated areas. Before amending the Code, the Federal Assembly passed a new law on the Regulation of Tariffs in the Municipal Utility Sector (2004). This law was intended to reform the tariff system and make it economically viable by establishing an independent body, which would review and modify tariffs on a regular basis. Other important laws are the Law on Concession Agreements (which came into force in 2005 and introduced the framework for co-operation between public and private sectors in the development of infrastructure) and the Law on Water Supply and Sanitation (which came into force in 2011 and established the framework regulating the relations in the WSS sector). At the national level, the Ministry of Construction Industry, Housing and Utilities Sector is responsible for proper WSS management.
The federal law on local governments delegates the organisation, maintenance and development of WSS services to local governments. There are a few cases, however, where the regional governments own WSS systems (e.g. Moscow and St. Petersburg). Local governments are asset owners of 95% of the water and sanitation infrastructure. WSS services are the responsibility of Vodoanalys or municipal unitary enterprises. There are over 800 Vodoanalys in the Russian Federation. Water quality is controlled and tested by the State Sanitary and Epidemiological Surveillance Centres. Other important agencies in the WSS sector are the Federal Tariff Service, the Federal Anti-Monopoly Service, the Federal Service for Supervision in the Use of Natural Resources, and the Federal Environmental, Industrial and Nuclear Supervision Service.

Tariffs are set by municipalities and, in some cases, by regional energy commissions. Since 2000, water tariffs have been constantly increasing, although there is still a chronic problem of unpaid bills. Starting in 2003, the number of private companies taking over management and operations of the water systems has rapidly increased. Usually, operators do not assume ownership of the assets, but operate them under a management contract, lease or concession agreement for between 15-49 years. These contracts are subject to competitive tendering. Early attempts at privatisation resulted in unclear contracts with unregulated aspects of tariff setting, which recently has become a significant problem. The WSS sector is represented by the Russian Association of Water Supply and Water Disposal (RAVV) and the National Union of Vodoanalys.

In 2012, 67% of the population (approx. 96 mln people) had access to supplied water; in urban areas this number was 84%. The average residential water use was 248 litres per capita per day. Russian utilities provide continuous 24-hour water service. The sanitation network coverage was 62%.

The Russian Federation is undertaking several modernisation programmes to replace obsolete infrastructure, improve water quality and build a new, efficient water industry. The Federal Clean Water Programme for 2011-17, for example, aims to guarantee access to potable water for all and general WSS sector development.

**WSS business models in small towns and rural areas**

The situation of WSS services in small towns and rural settlements is worse than in urban areas. Only 59% of the rural population have access to supplied water, while residents of small rural settlements (up to 200 people) have no access at all. In some small towns, multi-service communal utilities provide both water supply and sanitation services, and central heating services. In some cases, large factories (for example, metallurgical plants) supply cities with drinking water services. If they have their own wastewater treatment plants, they may also treat municipal wastewater.

Recently, massive efforts were made to improve the quality of service and water network coverage in rural settlements. The Russian WSS sector is clearly undergoing continuous reform whose results should be visible in the future. However, a real danger of “wild” privatisation has been highlighted, which in some cases created social and financial problems. These include pressure on companies to cut jobs, unsustainable price increases or public authorities left riddled with debt. This is also due to a complex legal system and weak regulation.

**Lessons learned for Kazakhstan:** the prevailing WSS services require a clear managing model. The challenges of the WSS sector are often due to the consequences of prior actions or lack thereof. Rapid and unconsidered efforts can worsen, rather than improve, the WSS situation. The participation of the private sector needs to be regulated by transparent rules and governmental bodies.
Multi-purpose utilities are common in small Russian municipalities, which help lower unit costs of maintenance and administration for WSS services.

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World Health Organization, website, www.who.int
7.13. Case study: WSS development in Romania

From decentralisation to regionalisation of WSS management in Romania

Background

Romania is located at the intersection of Central and south-eastern Europe and bordered by Hungary and Serbia (west), Ukraine and Moldova (northeast and east), Bulgaria (south) and the Black Sea (southeast). The country covers an area of 238,391 km². The population of Romania is about 20.1 mln people, with an average population density of about 84 residents per km². In 2013, according to the International Monetary Fund, the gross domestic product based on purchasing power parity of Romania was USD 282.35 bln (GDP PPP per capita USD 13,252). The climate of Romania ranges from temperate to continental. The volume of renewable water resources is 211.9 km³. Approximately 40% of supplied water has its source in groundwater.

Political system and administrative-territorial division

Romania is a unitary semi-presidential republic. The executive branch consists of the government and the president. The president appoints the prime minister who is the head of the Council of Ministers. The legislative branch of the government, the bicameral parliament, consists of the Senate and the Chamber of Deputies. Romania is divided into eight regional divisions (called development regions). However, these regions do not have an administrative status or legislative and executive council or government. Romania’s territory at the regional level is divided into 41 counties and the municipality of Bucharest (the capital city, which has a prefect, a general mayor and a city council). Each county is administered by a county council (responsible for local affairs) and a prefect (responsible for the administration of national affairs at the county level). At the local level, counties are further subdivided into 319 cities and 2,856 communes that have their own mayors and local councils.

WSS sector development

Over recent decades, the organisation of water supply and sanitation services in Romania has changed and is still changing considerably. Before 1990, the WSS sector operated as a public service at the county level in the form of 42 multi-service utilities, but without any central authority or ministry co-ordinating their activities. The tariff setting policy was established at the national level without cost recovery criteria, which resulted in financial losses by many utilities. Water supply services at that time lost about half their water in distribution networks (owned by county councils). There was also significant energy consumption, poor customer service, weak asset maintenance and supply discontinuity.

After 1990, Romania returned to the principle of local autonomy, and major responsibilities were transferred to the communities. At that time, over 800 water utilities were operating in Romania. A legal framework was established to support the autonomy of local councils, including the Law on Environmental Protection (1995), the Water Law (1996), the Law on Local Public Administrations (2001) and the Law on Public Services (2002). The Water Law and the Law on Environmental Protection together constitute the regulatory and legal framework for water management. In accordance with these laws, the following institutions are included in the institutional WSS framework: the Ministry of Environment and Sustainable Development (responsible for national strategy and policies on water resource management and protection); the National Water Authority Apele Romane (a state-owned joint-stock company in charge of implementing the national water management strategy); the Ministry of Agriculture, Forestry, Water and Environment; the Ministry of Health (monitoring drinking water quality); and local Environmental Protection Inspectorates (responsible for general environmental protection).
To become a member of the European Union, Romania also negotiated a transitional period for implementation of the EU Directive on the quality of drinking water until the end of 2015. The Urban Waste Water Treatment Directive has to be implemented by the end of 2018. However, this deadline is unlikely to be met. The accession of Romania to the EU steered the reform of the WSS sector towards regionalisation based on the Intercommunity Development Agency. The goal is to concentrate the management of WSS services in the hands of 40-50 larger operators. The Intercommunity Development Association (IDA – a collaborative structure of municipalities), which defines operational requirements and controls provisions, would merge local utilities into regional operation companies (ROC). The IDA could establish the ROC on the remnants of former water utilities or the ROC could be entirely new or even private. Shares of the ROC are often owned by the municipalities, the IDA and, sometimes, by the county as well. Under this framework, assets ownership remains exclusively with the public authority. Water utilities operate under the oversight of the National Regulatory Authority for Public Utilities (ANRSC) supervised by the Ministry of Public Administration.

In 2012, according to the Romanian Statistical Office, 12.1 mln people were connected to the public water supply system, which represents 56.8% of the Romanian population. Differentiating for urban and rural areas, water utilities service approx. 91% of the urban population, while only 21% of the rural population have access to piped water. Generally, only 43% of the population are connected to both water and sewage services (83% urban, 11% rural). The water tariffs policy has undergone several revisions over the last 10-15 years, most recently in 2007. In 2008, the average drinking water tariff without VAT was RON 2.15/m³ (approx. USD 0.65/m³), and average sewerage tariff rate was approximately equal to RON 1.03/m³ (approx. USD 0.31/m³). The water tariff rate is relatively high considering the population’s income (hence, there are affordability issues). Therefore, operators are confronted with the problem of recovering unpaid fees.

**WSS business models in small towns and rural areas**

In Romania, 45% of the population live in rural areas; it is estimated that only 21% is connected to centralised water, while almost the entire rural population lacks connection to sewerage systems (only 11% of the population have access). During the regionalisation process, major investments were concentrated in urban areas, while rural areas were not financially supported. Thus, recently Romania had to invest significant funds in WSS development in rural areas to meet EU requirements. Rural areas are expected to benefit to a greater extent from successful implementation of EU directives in the future. In principle, the business model of WSS in small towns and rural areas is based on the Intercommunity Development Agency and regional operation company; in practice, the model applies only to a small percentage of the rural population. The rest rely on individual wells and tanks. To sum up, the regionalisation process of the Romanian WSS sector is still in progress. In the next few years, a massive effort should be made to develop WSS in rural areas. Additionally, infrastructure improvement is also necessary to minimise water losses and to improve the quality of supplied water. Generally, with the help of the EU, Romania is gradually improving the performance of its WSS sector, and that trend is expected to continue.

**Lesson learned for Kazakhstan:** WSS models of an extreme level of consolidation or delegation seem not to fulfil the basic services of delivering good quality water to consumers. Accomplishing these objectives can be done through a WSS model that combines an adequate level of service delegation and sector consolidation. Activities focusing on fulfilling international standards reflect positively on the WSS sector as a whole.

Romania is a good case of successful regionalisation; though it was not compulsory, there were very high incentives attached to the process. Romania also benefits from relatively good sector regulation. Regionalisation was done at the county (rayon) level, and small towns and rural areas benefit from economies of scale and a unified tariff for the service area.
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Centralised WSS management at the crossroad between decentralization and regionalisation in Tajikistan

Background

Tajikistan is a country in Central Asia bordered by Afghanistan (south), Uzbekistan (west), Kyrgyzstan (north) and the People’s Republic of China (east). The country covers an area of 143,100 km². The population of Tajikistan is about 8 mln people, with an average population density of about 56 inhabitants per km². In 2013, according to the International Monetary Fund, gross domestic product based on purchasing power parity was USD 19.30 billion (GDP PPP per capita of USD 2,374). The climate is continental, subtropical and semi-arid. Total amount of renewable water resources is 21.91 km³. However, only 4% of drinking water comes from groundwater.

Political system and administrative-territorial division

Tajikistan is a unitary semi-presidential republic, with the president as both the head of state and the government. The government runs the system of executive authorities and is composed of the prime minister and his deputies, ministers and chairpersons of state committees. The bicameral Supreme Assembly includes the Assembly of Representatives and the National Assembly. Tajikistan is divided into four administrative divisions: one autonomous province, two provinces and the District of Republican Subordination. Each region is subdivided into rayons (64 total) and, further, into jamoats (401 small town and village self-governing units).

WSS sector development

The WSS sector in Tajikistan needs significant improvements. Difficulties caused by the post-Soviet transition and the civil war had a negative impact on WSS infrastructure. Over the last decade, the government has passed more than 15 state programmes, strategies and national development action plans to regulate water-related issues. One of the first steps in changing WSS sector legislation was the approval of the Water Code (2000) and its subsequent amendments in 2006, 2008 and 2009. In 2005, the president of Tajikistan initiated a long-term social and economic programme – National Development Strategy (NDS, approved in 2007), which, among other priorities, focuses on improving people’s access to utility services. The 2007 Concept Paper on the Transition of the Republic of Tajikistan to Sustainable Development was intended to ensure safe drinking water supply and provision of basic sanitary services through large-scale rehabilitation and efficient management of the WSS infrastructure in cities and regional centres. The Concept Paper on Housing and Community Amenities (HCA) Reform for 2010-25 was approved in 2010 with the goal of creating economic, legal and organisational conditions for the housing sector. Key objectives of this reform include the decentralisation of the WSS sector, the creation of a legal and regulatory framework for housing development and separation of regulatory functions from service providers. Additionally, several other reforms were approved in Tajikistan: Rules for Connection to Engineering Networks and Provision of Utility Services (2009), the Law on Drinking Water and Drinking Water Supply (2010) and the Rules for Operation of Water Supply and Sanitation Systems in the Republic of Tajikistan (2011). However, the legal and regulatory framework of the WSS sector still needs to be improved.

The Water Code prohibits privatisation of WSS systems, thereby ensuring public ownership. The State Unitary Enterprise Zhilishchno-Kommunalnoye Khozyaystvo (KhMK) is in charge of the state WSS policy, as well as of WSS service provision in the country. Its services, covering more than 1.5 mln people, are provided by 41 WSS subsidiaries within KhMK. At the same time, cities such as Dushanbe, Khujand,
Rogun and Nurek directly control their local water utilities (which function outside of the KhMK system) and serve about 1 mln people. There is a serious problem with the quality of drinking water in Tajikistan. Tariffs for potable water do not cover operational costs of WSS enterprises, which brought the greater part of WSS facilities to an extremely critical state.

In 2012, 57.6% of the Tajik population had access to water supply services (87% of the urban population and 43% of rural). Drinking water supply infrastructure consists of 753 centralised systems, of which 105 are community water supply systems and 648 are institutional water supply systems. However, 413 (54.8%) centralised water supply systems are not compliant with sanitary requirements, 34% of which is due to the absence of sanitary protection zones around sources of water supply and 46.1% due to the lack of water disinfection equipment. As many as 113 WSS systems are non-operative. The rate of sanitation coverage is much lower than centralised water coverage. Only 23% of the population has sustained access to centralised sanitation systems (80% of urban residents, 18.2% of residents of urban-type settlements and regional centres, and 0.2% of the rural population). Only 29 of 62 cities, regional centres and small towns in the republic have centralised sanitation systems. Average water consumption varies from 30-180 litres per capita per day, while service continuity is 18-24 hours per day in urban areas and 4-18 hours per day in rural areas. Losses in water systems are close to 50-60%. Average charge for 1 m³ of water varies from USD 0.03-0.7. Given such a difficult situation, international financial institutions, such as the World Bank, have been supporting the development of municipal infrastructure in Tajikistan (MIDP). The USD 22 mln grant to MIDP aimed to improve access, quality and efficiency of basic utilities for the population of participating cities. The project covered 13 cities and regions in the republic. Currently, the European Bank for Reconstruction and Development (EBRD) is funding and implementing several water supply system rehabilitation projects in the cities. The projects are worth over USD 73 mln, divided between a loan and a grant. One project funded by the EBRD seeks to create water utilities in each region of Tajikistan, which would serve as regional competence and resource centres for local subsidiaries. It is unclear how this reform will deal with water utilities operating under direct control of the cities. Another issue is the lack of clarity concerning the future place and role of the centralised agency KhMK in the WSS sector.

WSS business models in small towns and rural areas

The situation of WSS services in rural areas in Tajikistan is especially difficult. About 75% of the population live in rural areas; only 43% have access to supplied water and only 0.2% to sanitation. Since 2012, the responsibility for WSS services in rural areas has been vested in KhMK (in the past, it was the responsibility of the Ministry of Amelioration and Water Resources, recently eliminated by the government). Rural and agricultural water supply systems, which once belonged to the former sovkhoz and kolkhoz farms, were transferred to the ownership of local municipalities. Close to 15% of rural drinking water supply is provided by local water utilities, while the rest is provided by water users’ committees, associations, and, in some cases, by individuals. Only 40% of water supply systems are operational, while the rest operate partially (44%) or are non-operational (16%). The situation in the WSS sector in rural areas requires not only improvements in the WSS infrastructure, but also the development of sustainable WSS business models.

Lesson learned for Kazakhstan: The poor situation in the WSS sector, being a consequence of haphazard management and political issues, requires immediate action. There is also a risk of rushing through new legislation, which can worsen, rather than improve, the situation for the WSS sector. In such cases, international experience should be taken into account, and further actions should focus on improving WSS coverage.

Similar to other countries of the Caucasus and the Kyrgyz Republic, small-scale WSS systems are often managed by community-based organisations.
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7.15. Case study: WSS development in Turkmenistan

Free drinking water for households with a high level of water consumption and water losses

Background

Turkmenistan is a country in Central Asia bordered by Afghanistan (southeast), Iran (south and southwest), Uzbekistan (east and northeast), Kazakhstan (northwest) and the Caspian Sea (west). The country covers an area of 491,210 km². The population of Turkmenistan is about 5.1 mln people, with an average population density of about 10 inhabitants per km². In 2013, according to the International Monetary Fund, gross domestic product based on purchasing power parity was USD 53.59 bln (GDP PPP per capita of USD 9,394). Turkmenistan has a continental desert climate. The total amount of renewable water resources is 24.77 km³.

Political system and administrative-territorial division

Turkmenistan is a presidential republic with the president as the head of both the state and the government. The president is the highest official of Turkmenistan and acts as a guarantor of national independence, territorial integrity and adherence to the constitution and international agreements. The legislative branch of Turkmenistan is represented by the Assembly. Turkmenistan is divided into five provinces and one capital city district (Ashgabat, area 470 km², pop. 958,030). The provinces are further subdivided into 57 districts (32 counties and 25 cities). The president appoints heads of districts. According to the Constitution of Turkmenistan, some cities have the status of a province (cities over 500,000) or district (over 300,000). There are 79 small towns (over 8,000 people), 559 villages (min. 2,000 people) and over 1,900 settlements (at least 50 permanent inhabitants).

WSS sector development

For the most part, existing WSS systems were built in the 1950-80s. At the time, policies in the WSS sector focused on developing new water sources, and expanding the capacity of both pumping stations and main water distribution pipes. However, the operational management and long-term development plans did not include technical optimisation of resources, reducing consumption and installing water metering devices. Therefore, these activities were not adequately financed. As a result, within 10-15 years of independence, the quality of the WSS services dramatically deteriorated. Currently, providing water of sufficient quality and quantity to individual consumers is still a challenge. Therefore, increasing access to potable water is an official national policy priority.

The most important laws and regulatory documents pertaining to the WSS sector in Turkmenistan include the Code on Administrative Violations (1984), the Law on Nature Protection (1991) and the Water Code (2004). The Water Code establishes the sphere of competence for different levels of government dealing with water resources management – the Cabinet of Ministers; state institutions in charge of use, regulation and protection of water resources; local executive bodies; public organisations and common citizens. The Cabinet of Ministers approves key legislation in the areas of water management, water protection and WSS sector development. At the governmental level, the Ministry of Water Management is the main body for water management, while the Ministry of Health and Medical Industry together with the Sanitary and Epidemiological Service monitor water quality regularly. The Water Code stipulates basic principles of water consumption: water for household drinking purposes shall be delivered to the public free of charge; maintenance costs of inter-farm systems shall be incurred by the users to whom those systems belong; and financing, reconstruction and operation of water management facilities of national, inter-basin, inter-district and inter-farm significance shall be at the expense of the state budget.
Before 2011, the responsibility for providing centralised WSS services was assigned to special public utilities subordinated to local governments. In the spring of 2011, a new Ministry of Community Amenities was established to oversee utilities, including provision of WSS services. There are also small systems owned by enterprises, which supply potable water to neighbouring villages; the enterprises take care of in-house maintenance. Participation of private entities in the WSS sector is limited to tenders to build or rehabilitate residential facilities. Free access to water by households eases financial pressure on the population, but makes WSS systems financially unsustainable. Therefore, the private sector has little interest in participation in WSS. However, there is a charge for industrial water consumption; in that segment, private operators could be an option. Despite the low interest of private companies in domestic water services, a few have service contracts with municipalities where water charges are paid from the public budget.

About 63% of the population is connected to the centralised water supply systems (84.5% of urban users and 42.1% of the rural population). Average water consumption is 323 litres per capita per day. This high value is a result of massive water losses in water networks, which are close to 75%. Only some urban areas have continuous 24-hour water supply services, which on average last around 18 hours per day. Some towns supply a majority of citizens with water for only two hours twice a week. In accordance with the Water Code, water is supplied to customers free of charge. However, according to the World Bank, people are willing to pay a considerable share of their family budget for quality WSS services. Sewerage systems are available only in major cities.

Currently, there are several programmes in Turkmenistan intended for development of the WSS sector. The National Program for Transformation of Social Conditions for the Population of Villages, Small Towns, Etrap (District) Cities, and Etrap Centers through 2020 aims to improve social conditions of the population in villages and small towns. Capital investment totalling about USD 4 billion is projected for programme implementation. Additionally, the president also approved the National Program for Social and Economic Development of Turkmenistan for 2011-30 to promote innovative development of the national economy and create highly productive sectors and production facilities, which would create jobs and lower the country’s imports.

WSS business models in small towns and rural areas

Approximately 50% of the population live in rural settlements. Overall, only 72% have access to improved drinking water sources; however, only 42.1% have access to piped water. The rest receive water from street pumps and irrigation canals and reservoirs, which serve as sources of municipal, domestic and drinking water in rural areas. Average water supply in rural areas is six hours per day. The absence of sanitation systems negatively impacts water quality and leads to diseases. WSS management in rural areas also suffers from a shortage of trained personnel. Since improvement in this area is especially needed, the national government has made a massive effort in the WSS sector; sustainable access of the rural population to safe drinking water is officially a national policy priority. This policy is implemented through the development of centralised WSS systems and social campaigns intended to raise awareness among the rural population. Further action is needed to improve the access of the population to safe potable water.

Lesson learned for Kazakhstan: Political transformation usually reveals many problems with basic public services. Delivering water for free may increase public satisfaction, but may undermine the cost effectiveness of WSS companies. Marginalising the participation of private companies in the WSS sector reduces competition, which negatively affects service level.
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7.16. Case study: WSS development in Ukraine

Some necessary improvements needed in the WSS sector in Ukraine

Background

Ukraine is a country in Eastern Europe bordered by the Russian Federation (east and northeast), Belarus (northwest), Poland, Slovakia and Hungary (west), Romania and Moldova (southwest) and the Black Sea and the Sea of Azov (south and southeast). The country covers an area of 603,628 km$^2$. The population of Ukraine is about 44.5 mln people, with an average population density of about 74 inhabitants per km$^2$. In 2012, according to the International Monetary Fund, gross domestic product based on purchasing power parity was USD 340.68 bln (GDP PPP per capita of USD 7,532.92). Ukraine has a mostly temperate continental climate. Total amount of renewable water resources of the country is around 139.6 km$^3$. Almost 80% of drinking water has its source in surface waters. The main rivers in Ukraine are trans-boundary.

Political system and administrative-territorial division

Ukraine is a unitary republic under a mixed semi-parliamentary semi-presidential system with separate legislative, executive and judicial branches. The legislative branch is the unicameral parliament. The parliament is responsible for the formation of the executive branch and the Cabinet of Ministers, headed by the prime minister. The country is divided into 24 oblasts (provinces) and the Autonomous Republic of Crimea. Average land area of oblasts is 25,150 km$^2$. Additionally, the capital city, Kiev (pop. 2.8 mln), and the city of Sevastopol (housing Russian Black Sea Fleet under a leasing agreement) both have a special legal status. The oblasts are further subdivided into 490 districts. The average area of a district is 1,200 km$^2$ with the average population 52,000 people. In 2012, Ukraine had 459 cities, 885 small towns (500-2,000 inhabitants) and over 28,400 rural settlements.

WSS sector development

The WSS services in Ukraine can be characterised by high consumption of water per capita per day, inadequate maintenance of infrastructure and insufficient finances. Like other post-communist countries in Central and Eastern Europe, Ukraine has a relatively high rate of water supply coverage, but the percentage of sewerage coverage is rather low. One of the main problems relates to the high rate of water losses and the state of WSS infrastructure. Since gaining full independence (1991), the country’s water supply and sanitation sector has changed considerably. State-owned utilities were decentralised and transferred to municipalities. In 2002, municipalities possessed 61 utilities, while only 4 remained in the hands of the central government.

Responsibility for the WSS services is divided between the national government, regional state authorities and local governments. Several laws define responsibility of authorities at various levels, such as the Law of Ukraine on Drinking Water and Drinking Water Supply, the Law on Housing and Communal Services, and the Law of Government Regulation in the Area of Communal Services. At the national level, the cabinet of ministers co-ordinates activities in the water sector and implements national policy in collaboration with the National Commission for Government Regulation in the Area of Communal Services. At the national level, the cabinet of ministers co-ordinates activities in the water sector and implements national policy in collaboration with the National Commission for Government Regulation in the Area of Communal Services. At the national level, the cabinet of ministers co-ordinates activities in the water sector and implements national policy in collaboration with the National Commission for Government Regulation in the Area of Communal Services. At the national level, the cabinet of ministers co-ordinates activities in the water sector and implements national policy in collaboration with the National Commission for Government Regulation in the Area of Communal Services. At the national level, the cabinet of ministers co-ordinates activities in the water sector and implements national policy in collaboration with the National Commission for Government Regulation in the Area of Communal Services. At the national level, the cabinet of ministers co-ordinates activities in the water sector and implements national policy in collaboration with the National Commission for Government Regulation in the Area of Communal Services.

Despite the existing prohibition of the privatisation of infrastructure, WSS service providers can operate under all forms of ownership: private companies (or individual entrepreneurs), communally-owned utilities (owned by cities, villages and residential settlements), state utilities (owned by the central government),
and utilities established and operated under mixed forms of ownership. The most typical organisational forms of WSS utilities include communal unitary enterprises (most commonly used), lease companies and joint stock companies. In 2007, 356 WSS service providers and over 6 000 small local providers operated only water supply systems. In addition to these providers, there are also Oblast Vodocanal (for example Donbass Voda) and inter-rayonal water mains (e.g. in Crimea), as well as the case of a metallurgical plant supplying municipalities with drinking water (e.g. in the east-south oblasts). The National Commission for Government Regulation in the Area of Communal Services and Municipalities sets utility tariffs in accordance with the full cost recovery principle.

Ukraine has a relatively high rate of water supply coverage, and 83.3% of the urban population have access to supplied drinking water. Unfortunately, the smaller the settlement, the lower the rate of coverage of the WSS services is. Of 885 towns, 761 have water supply networks, while only 6 225 of 28 450 rural settlements (22.1%) have the same level of infrastructure. Most of Ukraine’s water infrastructure was built in the 1960s-80s; its ageing condition results in high water losses. The average level of water loss is 32%, with periodical leakage exceeding 50%, and that number is constantly rising. In addition to leakage problems, there are issues with adequate water pressure. Other issues related to water supply systems include poor water quality (often below WHO norms) and unreliable continuity of water supply. Approximately 2.5 mln people are serviced with drinking water only in the early hours of the day, while the average time of sustained water supply is 18 hours per day. The overall water consumption per capita has been decreasing, but remains relatively high (at 350 litres per capita per day) compared to Western European countries. The level of metered water is around 38%. Current water tariffs do not cover all costs, therefore WSS utilities are unprofitable. Average water and wastewater fees are equal to UAH 4.9/m³ (approx. USD 0.57/m³). Generally, around 70% of the population has access to centralised water supply services and around 50% to centralised wastewater services.

Currently, renovations for WSS infrastructure are implemented through long-term programmes, such as the Drinking Water Programme for Ukraine for the years 2011-20. These programmes continue earlier reforms. Programmes are financed from the Ukrainian budget. Other modernisation projects of the WSS sector financed by international organisations are also underway.

**WSS business models in small towns and rural areas**

By comparison with urban areas, the situation in rural settlements is especially alarming. Only 25% of rural settlements have water supply infrastructure, a majority of which is in critical condition. The result is substandard water quality due to poor management. Smaller rural water service providers operate in isolation from the wider WSS sector and without the necessary licences and permits, due to inadequate enforcement of the regulatory requirements. Lack of proactive maintenance practices results in inefficient operations and maintenance of water supply systems and poor service to customers. In summary, the regulatory system in the WSS sector in Ukraine is in constant revision and reform. It still requires additional changes to establish a clear and simple system for water operators irrespective of the type of ownership or service area. It is also obvious that not all aspects of decentralisation have been adequately implemented.

**Lesson learned for Kazakhstan:** a proper WSS managing model requires a balance of different administrative levels: central, regional and local. All actions in the WSS sector should consider its effects on other stakeholders. Implementing national plans, financed by their own sources or by international organisations, seems to be better than the current fragmented approach in local municipalities.

Ukraine, like many other countries in the region, has undergone a decentralisation process, but it has not been adequately implemented. In addition, the regulatory framework is weak.
Multi-purpose utilities are common in small Ukrainian municipalities, which help lower the unit costs of maintenance and administration for WSS services.

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7.17. Public-private partnership in the water supply and sanitation sector

This annex presents an overview of the following PPP models in the water supply and sanitation sector:

- service contracts
- management contracts
- leasing
- concession
- build – operate – transfer
- divestiture.

**Service contracts** involve “contracting out” specific operations and maintenance to the private sector, usually for several years. Under this type of contract, the public provider sets performance criteria for the activity, evaluates bidders, supervises the contractor and pays an agreed-upon fee for the services; this may be based on a fixed price for a specific term (cost-plus-fixed-fee) or on a fixed unit price basis. To achieve greater efficiency gains, contracts should be awarded through competitive tendering. Service contracts are a cost-effective way to meet special technical needs for a utility, which is already well managed and commercially viable. However, they cannot be a substitute for reform in a utility plagued by inefficient management and poor cost recovery.

**Management contracts** extend the responsibility of the private sector beyond individual service functions to a broader scope of operations and maintenance, usually for up to five years. If the contractor receives a set fee for services rendered, the contractual arrangement differs little from technical assistance. Under this institutional form of service delivery, a portion of the contractor’s compensation is based on performance; thus, the contractor shares some of the commercial risk with the enterprise to which the service is being provided. In France, for example, where management contracts in the water supply and sanitation sector are common, incentives for productivity improvement are provided by linking the contractor’s payment to indicators such as leakage reduction or number of connections. Management contracts are most likely to be useful where the main objective is to rapidly enhance a utility’s technical capacity and efficiency in performing specific tasks, or to prepare for greater private involvement. Thus, management contracts can be a good first step towards more full-fledged private sector involvement if conditions make it difficult for long-term government commitment. They could also induce the private sector to undertake capital investment or accept commercial or political risk. For example, a management contract might be chosen where:

- tariffs are too low to support commercial operations, and the government needs time to increase tariffs or develop a system of public subsidies compatible with private sector participation
- the regulatory framework has deficiencies that need to be remedied before a long-term private sector arrangement can be secured
- the country lacks a good track record in public-private partnerships
- local government faces difficulties in getting key stakeholders to agree to the long-term involvement of the private sector.
In such conditions, a management contract can provide a window of opportunity for developing trust between public and private sectors, and creating a regulatory environment more conducive to private sector risk-taking.

**Leasing** involves a private contractor paying the public owner for the exclusive right to operate a particular service facility and bearing full commercial risk without the responsibility for major investments. A lease contract, also referred to as a franchise or licence, gives the contractor an exclusive right to the revenue stream from providing the service. This institutional form has been used for decades in water supply and sanitation systems in France and Spain and elsewhere in the municipal solid waste management sector. Under this institutional form, the public owner (lessor) remains responsible for fixed investments and debt service. In a water supply leasing arrangement, the contractor (lessee) must normally finance working capital and replacement of short-lived assets, such as small pipes. Leases are most appropriate when there is a possibility for big gains in operating efficiency, but only limited need or scope for new investment. “Pure” leases are rare, however. Most place some responsibility for investment on the private partner, if only for rehabilitation works. These contracts operate as a hybrid between a lease and a concession contract.

**Concessions** assign a private partner the responsibility not only for the operations and maintenance of a utility’s assets, but also for investments. However, asset ownership remains with the government, and full use rights to all the assets, including those created by the private partner, revert to the local government when the contract ends, usually after 25 to 30 years. Concession arrangements exist in most infrastructure sectors, including water supply, wastewater treatment, and solid waste disposal and treatment. In a concession, investment plans and implementation are subject to review by the government authority issuing the contract. Assets created by the concession revert to the public owner upon completion of the concession. The contractor’s compensation is based on the tariffs for the goods or services produced determined according to an agreement stipulated in the concession contract. The level of tariff revenue should be sufficient to cover the operational expenses, as well as debt service and depreciation on the concession’s investments. Concessions are normally negotiated for periods of up to 30 years depending on the design life of the investments. The main advantage of a concession is that the private sector takes full responsibility for operations and investment, thereby creating incentives for efficiency in all of the utility’s operations. Therefore, a concession is an attractive option when large investments are needed to expand the coverage or to improve the quality of services. However, administering a concession can be a complex issue for the local government because it confers a long-term monopoly on the concessionaire. The quality of regulation is highly important in determining the success of the concession, particularly the distribution of its benefits between the concessionaire (in profits) and consumers (in lower rates and improved service).

**Build – operate - transfer (BOT)** arrangements resemble concessions by providing services in bulk and are normally used for greenfield projects, such as a water or wastewater treatment plants. In a typical BOT arrangement, a private firm might undertake to construct a new water treatment plant, operate it for a number of years and then relinquish all rights to it to the public utility at the end of the contract. The government or distribution utility would pay the BOT partner for water from the project at a rate calculated over the life of the contract to cover its construction and operating costs and to provide a reasonable return. The contract between the BOT concessionaire and the utility usually operates on a take-or-pay basis, obligating the utility to pay for a specified quantity of water whether or not that quantity was consumed. This places all the demand risk on the utility. Alternatively, the utility might pay a capacity charge and a consumption charge, an arrangement that spreads the demand risk between the utility and the BOT concessionaire. BOTs tend to work well if the main problem a utility faces relates to water supply or wastewater treatment. If the problem is a faulty distribution system or poor collections performance, a BOT is unlikely to remedy it – and may even aggravate it. There are many possible variations on the BOT model: in build-operate-own (BOO) arrangements, assets remain indefinitely with the private partner; in design-build-operate (DBO) arrangements, the public and private sectors share responsibility for capital.
investments. BOTs may also be used for plants that need extensive overhauls, arrangements sometimes referred to as ROTs (rehabilitate-operate-transfer). Another variation on the BOT model is called DFBOT that is design – finance – build – operate – transfer. In this model, the private firm takes full responsibility for an investment from the very beginning, from designing it and then financing, operating, and finally, transferring the asset to the public utility.

**Divestiture** of water and sewerage assets (through sale of assets or shares or through a management buyout) can be partial or complete. A complete divestiture, like a concession, gives the private sector full responsibility for operations, maintenance and investment. Unlike a concession, a divestiture transfers ownership of the assets to the private sector; thus, the nature of the public-private partnership differs slightly. A concession assigns the government two primary tasks: to ensure the utility’s assets, which the government continues to own, are used well and returned in good condition at the end of the concession; and, through regulation, to protect consumers from monopolistic pricing and poor service. A divestiture leaves the local government only the task of regulation, since, in theory, the private company should be concerned about maintaining its asset base. But private companies may not always take the long view. Even with an asset sale, the regulator may need to scrutinise the utility’s plans for renovating or enhancing its assets. In England and Wales, the regulator requires utilities to report the serviceability of their assets.

Although widely used in other infrastructure sectors, divestitures in the water and sanitation sector have been limited to England and Wales. (Private water supply companies have also long operated in parts of the United States.) Given the national economic importance of infrastructure services, governments are generally unwilling to divest water and sanitation assets without safeguards. The UK government retains “safety net” powers to appoint another operator in case a water supply company fails. It also limits the length of the licences under which water supply companies operate.
7.18. Review of business models in the water supply and sanitation sector and lessons learned from their application in the EU and EECCA

Although there is no universal “one size fits all” model for the management of WSS services, and a model successfully functioning in one country may not work in another, international experience provides important lessons for developing a country’s approach to WSS management. This section summarises the review of WSS management models in selected countries in Europe and Eastern European, Caucus and Central Asia (EECA). The review was part of Phase 2 of the Sustainable WSS Business Models for Small Towns and Rural Areas Project in Kazakhstan; its objective was to inform and facilitate the national policy dialogue on best possible models of institutional development of WSS in small towns and rural areas in Kazakhstan.

Since WSS is considered an essential service, WSS service delivery falls under the responsibility of public authorities. Depending on a country’s public administration system, the responsibility is assigned to public authorities at a specific administrative level. In countries with decentralised public administration, the responsibility is usually assigned to municipalities, which are the lowest level of local government and the lowest administrative level to the population. By assigning the legal responsibility for WSS services delivery to a specific administrative level, the legal framework designates a theoretical WSS service area. In the case of a decentralised system, it is the same as the administrative territory of a municipality. However, it is only a theoretical service area because WSS services are delivered only to the residents of the territory covered by WSS infrastructure. Those residing outside the area of the centralised WSS system have to rely on small-scale systems or individual WSS solutions. Usually the latter is the case in rural areas, while urban areas have centralised (piped) WSS systems. However, if the legal framework assigns responsibility for the delivery of WSS services to municipal authorities, they must organise WSS services in the entire territory of the municipality, regardless of whether it is urban or rural. Assigning responsibility for delivery of WSS services to small municipalities may fragment the WSS sector, creating many small and weak water utilities. Countries that face this problem have tried to reform the sector by consolidating and aggregating the WSS sector (so-called regionalisation of WSS utilities).

The review of experience in WSS management in selected countries shows two main factors that determine the choice of models for WSS service delivery: the degree of consolidation or aggregation of the WSS sector; and the degree of delegation (degree of managerial and financial autonomy of the WSS operator and degree of private sector participation in WSS).

Using these two key factors, Figure 5 classifies the WSS models of selected countries in Annex VII into four groups:

- countries with a low degree of consolidation and a low degree of delegation: Kyrgyzstan, Ukraine, Poland, Finland and the Russian Federation
- countries with a high degree of consolidation and low degree of delegation: Tajikistan, Turkmenistan and Azerbaijan
- countries with a low degree of consolidation and a high degree of delegation: France and the Czech Republic
- countries with a high degree of consolidation and a high degree of delegation: Georgia, Armenia, Romania, Italy, and England and Wales.
This grouping of countries is based on the contractual nature of WSS services and represents national experiences in the two key policy dimensions of consolidation and delegation of services.

**Figure 5. Degree of consolidation and delegation of WSS services in selected EU and EECCA countries**

![Diagram showing degree of consolidation and delegation of WSS services in selected countries](image)

*Source: Authors’ own assessment.*

Figure 6 presents a classification of business models reviewed, based on the **degree of delegation** (degree of managerial and financial autonomy and degree of private sector participation) and the **degree of consolidation (aggregation)** of the WSS sector. The matrix does not cover all the possible business models of WSS service delivery, but rather shows potential models in relation to policy decisions on the consolidation of WSS services, and the autonomy of WSS service providers.
The business models reviewed are discussed below following the proposed classification.

**A. WSS service delivery models classified by the level of managerial and financial autonomy**

**Community management model of WSS services**

The community management model of WSS service delivery is a natural alternative to individual WSS systems. Usually, a small-scale WSS supplier serves a village or rural settlement, although one can find countries where this model covers larger territories. Residents of a given community form an organisation, which can have different legal forms and names depending on the country’s legal framework. This organisation, acting on behalf of residents, is responsible for delivery of WSS services. Community management of WSS services can be found all over the world, and each country develops its own specific model most suitable to local conditions. Community management has become the leading concept for implementing water supply projects in rural areas as a direct result of a broader transition from centrally planned or supply-driven approaches to demand-oriented and decentralised public governance models. The
basic principle of this model is consumers’ participation in decision making, community control, ownership and cost sharing. A group of residents works together to solve a problem related to WSS services and decides to build a small-scale centralised WSS system for their community. Usually with external assistance, as well as their own contributions, they make the investment and hand it over to a community-based organisation (association, co-operative) for operation and maintenance. All residents participate in covering the costs of WSS services in the form of water tariffs or monthly fees. In addition, they contribute to the costs of rehabilitation.

A community-based organisation can operate and maintain WSS infrastructure by itself or contract out to a private company. Although there are many benefits of community-managed WSS, the model has its limitations, especially when it comes to sustaining services. It is increasingly recognised that a majority of communities cannot independently maintain their WSS systems; they require some form of external assistance over the long term.

Community management models with their many benefits have been regarded as an answer to the failure of previous supply-driven approaches for providing WSS services. These previous models often did not meet the real needs of users and resulted in systems that broke down far earlier than their designated lifespan. However, the community management model is by no means without challenges of its own. Despite the strong investment of many projects in capacity building, a significant number of systems still run into problems. Widespread evidence suggests that after a number of years of operation (or just a few years in some cases), many rural systems face a variety of problems and obstacles linked to financial, technical and environmental sustainability. It is now increasingly recognised that most communities will be unable to manage their own WSS systems without some form of external assistance. Even with improved approaches that increase local capacity, it is simply not realistic to expect rural communities to be completely self-sufficient, especially in the first years after the systems have been constructed. Although figures vary, studies from different countries indicate that approximately 30% to 40% of rural WSS systems either do not function or else operate significantly below design indicators. Constructing physical systems is an obvious requirement, but just a first step in a more complex set of actions needed to provide truly sustainable services; increased coverage does not equate to increased access to WSS services. For rural WSS systems to be sustainable, this model requires not only local capacity building measures, but also broader institutional assistance (e.g. repairs, water quality control, etc.).

**Municipal management models of WSS services**

Several possible WSS business models within the framework of municipal management, as well as basic models, are presented in Figure 6. The first model is the direct delivery of WSS services by the municipal administration. This is usually applied at an early stage of WSS infrastructure development, which does not require more advanced institutional forms. In this situation, WSS services are delivered by a municipal department that employs a few technicians for operations and maintenance. This model of WSS service delivery is appropriate for small-scale WSS infrastructure with a small customer base; it would not be sufficient to ensure adequate revenue for independent service providers.

Larger WSS infrastructure requires a different approach. One alternative is to establish a budgetary organisation (budgetary unit or budgetary enterprise) for delivering WSS services. Although strongly linked to the municipal administration, a budgetary organisation is an external entity and has more autonomy than a department of the municipal administration. The budgetary organisation model can be implemented in the form of a budgetary unit of a local public administration (LPA), or budgetary enterprise. In the case of a budgetary unit, its operations are fully financed from the municipal budget, and the revenue from water tariffs goes to the municipal budget. A budgetary enterprise is different because the revenue from water tariffs is its revenue, used for covering the costs of providing services. If the revenue does not cover the costs, the municipal budget subsidises losses. In cases of both budgetary unit and
budgetary enterprise, investments are fully financed from the municipal budget. Budgetary organisations can be an option in the early stages of WSS infrastructure development, but they depend fully on the municipal budget.

An alternative model to a budgetary organisation with a higher level of managerial and financial autonomy, including investment, is the state or municipal enterprise or incorporated public company. Being fully owned by a public entity, state or municipal enterprises or incorporated public companies exercise higher managerial and financial autonomy than budgetary organisations, while remaining fully controlled by public authorities. In developed countries, state or municipal enterprises operating under a special set of laws and regulations are fully replaced by incorporated entities that are limited liability companies or joint stock companies. Usually, joint stock companies are used for large water utilities because the administrative costs associated with creating joint stock companies are higher than those for limited liability companies. In comparison with budgetary organisations, incorporated companies use accrual-based accounting principles and consider the depreciation of WSS infrastructure as a cost reflected in their water tariffs. They thereby generate funds for repairs and rehabilitation projects.

Because they operate under the principle of full financial cost recovery plus profit (the “cost plus” formula), the companies may also generate some funds for investment in retrofitting systems and development. Generally, the profit level of water utilities is not sufficient for larger investment programmes. For those with sufficient profits, the financial market – both local and international – is an additional option for large investments.

The model of a municipally-owned WSS operator is usually used to operate a centralised WSS system of a town or a city. It can be also used for several separate systems within a municipality, which is composed of a town and several villages. The model of municipally-owned incorporated companies can be applied only where revenue from the client base is sufficient to cover the cost of WSS services. In the case of an incorporated company, which includes the depreciation of WSS infrastructure assets in its tariffs, the price of WSS service delivery is much higher than in the case of a budgetary organisation. This means that transforming a budgetary organisation into an incorporated company will not be easy; it will require a significant increase of water tariffs and thus also additional measures to address affordability constraints.

Both budgetary organisations and incorporated companies may also provide some additional municipal services as well. This model is called a multi-service company (utility). It is usually implemented in small towns and villages that need all the municipal services, but have an insufficient number of residents to form a profitable client base for single service operators. In this situation, a multi-service operator is established to spread the overhead costs between all the services and thereby keep service costs affordable.

**PPP models of WSS service delivery**

The highest degree of delegation of WSS service delivery might be achieved in the public-private-partnership (PPP) model of WSS service delivery. In this case, a municipality enters into an agreement with a private company by delegating specific responsibilities for the delivery of WSS services. There are different options for PPPs, the most common of which are presented in Table 11.
Table 11. Public-private partnership options in the WSS sector

<table>
<thead>
<tr>
<th>PPP options</th>
<th>Asset ownership</th>
<th>Operations and maintenance costs</th>
<th>Capital investment</th>
<th>Commercial risk</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service contract</td>
<td>Public</td>
<td>Public and private</td>
<td>Public</td>
<td>Public</td>
<td>1-2 years</td>
</tr>
<tr>
<td>Management contract</td>
<td>Public</td>
<td>Private</td>
<td>Public</td>
<td>Public</td>
<td>3-5 years</td>
</tr>
<tr>
<td>Lease</td>
<td>Public</td>
<td>Private</td>
<td>Public</td>
<td>Shared</td>
<td>8-15 years</td>
</tr>
<tr>
<td>Concession</td>
<td>Public</td>
<td>Private</td>
<td>Private</td>
<td>Private</td>
<td>25-30 years</td>
</tr>
<tr>
<td>BOT</td>
<td>Private and Public</td>
<td>Private</td>
<td>Private</td>
<td>Private</td>
<td>20-30 years</td>
</tr>
<tr>
<td>Divestiture</td>
<td>Private or private and public</td>
<td>Private</td>
<td>Private</td>
<td>Private</td>
<td>Indefinite (may be limited by licence)</td>
</tr>
</tbody>
</table>


Each model has its own advantages, inconveniences and limitations, as well as prerequisites for successful implementation. The PPP option starts with a service contract, stipulating that the private company is only involved in operating the WSS infrastructure, while the public sector incurs capital investments and commercial risks. Under a management contract or lease and concession contracts, the private sector takes greater responsibility; and finally, in the case of a divestiture, the private sector takes the greatest responsibility for the provision of WSS services.

PPP models of WSS service delivery can be applied either at the municipal or at the regional and national levels. Whatever the level, more advanced PPP models can be implemented only in cases of profitable WSS services; this is rare in rural areas with insufficient concentration of WSS customers and greater affordability restrictions. Rural areas may have examples of service and lease contracts, where small private companies operate and maintain small WSS infrastructure. Other PPP models are applied in larger territories with enough customers to ensure sustained revenue, not only for covering the costs of operation and maintenance, but also for generating profits for a private company. Usually, these models work only in large cities or populated regions.

B. WSS service delivery models by level of consolidation (aggregation)

The models of WSS service delivery presented above are relevant for municipal service areas, where the local government has legal responsibility for the provision of WSS services. As mentioned earlier, when the responsibility for WSS services is assigned to a municipality, the territory of the municipality determines a theoretical WSS service area. This is theoretical because not all residents of the municipality will automatically have access to a centralised WSS system; only residents of the area covered by centralised WSS infrastructure will have access to it. Residents outside of this area will have to rely on other solutions, usually small-scale WSS systems or individual means of self-supply.

Concurrently with urbanisation and in search of potential economies of scale, centralised WSS systems usually expand to other territories nearby, thereby offering access to more residents. The extension of centralised WSS systems can stretch beyond the administrative borders of a given municipality. This WSS service delivery model is typical of a town or a city with the status of a municipality, and where WSS infrastructure extends to surrounding rural areas that also have the status of (another) municipality. This approach, called “regionalisation of WSS services”, assumes that larger service areas will provide the benefits of economies of scale and keep unit costs at the lowest possible level. As a natural monopoly,
WSS services need a specific size of service area to justify economically the costs of managing a centralised WSS system. In the case of a fragmented local government system, the municipal model of WSS service delivery faces the problem of insufficient economies of scale. In such cases, the regionalisation of WSS services offers a potential solution, leading to further consolidation and aggregation of the WSS sector.

Regional models of WSS service delivery

Regionalisation in this case means providing WSS services to several settlements in more than one municipality, or assigning responsibility for WSS services to a higher regional administrative level. Regionalisation can also be defined as grouping of several service providers into a single administrative and/or physical structure. In other words, regionalisation can mean interconnection of physical systems, as well as organisational co-operation through agreements between local governments (or their utilities) to share a number of operations; this could include, for example, providing operations and maintenance services on the territory of another municipality. Regionalisation of water services can offer a range of benefits. Specifically: i) interconnected water systems can help correct imbalances in water resources among municipalities; ii) organisational co-operation can deliver economies of scale in operations (and sometimes investments) and can help improve the sector’s efficiency (this is the most common driver of regionalisation reforms); iii) service providers can pool their human capacity, funds and resources; iv) differences in tariffs can be reduced due to cost-sharing possibilities (e.g. by applying a uniform tariff rate throughout the service area), thereby improving equity of access to services; and v) aggregated utilities are more likely to attract financial support from donors and, eventually, from the private sector. Access to credit and capital is also much easier and cheaper for operators with larger customer bases and revenue from user charges.

Figure 7. Two forms of regionalisation


For both forms of regionalisation, a specific legal and institutional framework for inter-municipal co-operation must be developed. Depending on the country’s legal framework and public administration system, inter-municipal co-operation can have different legal and institutional forms; in general, they can take one of the following forms:

- inter-municipal agreement
- inter-municipal association
- joint commercial code company.
Under the **inter-municipal agreement** model, municipalities interested in co-operating on WSS services enter into an agreement that stipulates the purpose of co-operation and roles and responsibilities of the municipalities. For example, a municipality may decide to purchase a surplus of drinking water from a neighbouring municipality instead of building their own water treatment plant. The agreement benefits both municipalities because the former will not have to build its own water treatment plant, and the latter will generate additional revenue by using its surplus capacity. A similar agreement can be signed for directing wastewater from one municipality to a wastewater treatment plant owned by another municipality.

More integrated operations require more advanced forms of **inter-municipal co-operation**. Under the inter-municipal association model, municipalities interested in co-operation for delivery of WSS services form an association to which they transfer responsibility and authority to act on their behalf in the WSS sector. Ownership of the WSS assets by participating municipalities is transferred to the association.

Usually, the association does not actually provide the services, but establishes a WSS operator while retaining control over its operations. This situation can create problems by limiting the autonomy of the WSS operator, especially when municipalities in the association are represented by local politicians. Another weakness of this model lies in the difficulty of striking a balance between small and large municipalities in the decision-making process.

The drawbacks of inter-municipal associations do not exist in the third model of **commercial code company**. Under this model, instead of establishing an inter-municipal association, municipalities interested in co-operating on the delivery of WSS services establish an incorporated company (a limited liability company or a joint stock company). They have two options: i) to jointly establish a WSS operator; or ii) to set up a WSS assets holding company for investment planning and selecting an operator, which is typically a private company.

Each municipality then transfers its WSS infrastructure assets to the company, thus contributing to its initial capital. This initial share typically determines the deciding power of a specific municipality in company management. However, there are various solutions for striking a balance between the interests of small and large municipalities, such as the establishment of veto rules.

A different approach to the regionalisation of the WSS sector is used when responsibility for the delivery of WSS services is assigned not to municipalities, but to a higher administrative-territorial level such as a region (rayon or oblast). In this situation, regional authorities decide how to fulfil this mandate in the territory of their region, which is typically much larger than several municipalities. They usually establish a regional WSS operator, either in the form of a limited liability company or a joint stock company. The regional WSS operator delivers WSS services in the entire territory of the region and usually has branches in each town and city where there is a centralised WSS system. As with the municipal management models, different PPP models, such as service contracts, management contracts, leases and concessions, and divesture (privatisation of WSS fixed assets) could be applied at the regional level.

Any discussion of regionalisation and consolidation of WSS services must include the **concept of agglomeration**, which was introduced in the EU Urban Waste Water Directive. Article 2 of the Council Directive of 21 May 1991 concerning urban waste water treatment (91/271/EEC) defines agglomeration as an area where population and/or economic activity is sufficiently concentrated for urban wastewater to be collected and directed to an urban wastewater treatment plant or to a final discharge point. The directive does not define “sufficiently concentrated population and/or economic activity”, leaving it up to individual countries. For example, in Poland, a minimum population concentration indicator is set at 120 connected people per km of sewerage network.
This idea has had a significant impact on the development of urban wastewater systems because it defines agglomeration not based on administrative boundaries, but on the concentration of population. It means that an agglomeration can include not only a city, but also a city (or town) and surrounding villages or several cities. It implies that several administrative entities could form one agglomeration and, vice versa, that several distinct agglomerations may cover a single administrative entity. This is a very important concept because legal responsibilities for the provision of WSS services are usually assigned according to a public administration system based on territorial-administrative divisions. The concept of agglomeration directs the attention of local policy makers to the concentration of the population and/or economic activity, and not to the administrative boundaries.

The model of national WSS operator

This model is based on the centralised approach. A national WSS operator acts more like a central government agency than a service provider. The national operator, in the form of a publicly owned joint stock company, participates in developing, and is responsible for implementing, a state policy on WSS and respective investment programme. The national WSS operator functions as an assets holding company and provides WSS services through its territorial (oblast or rayon level) subsidiaries (e.g. the case of Armvodocanal) or through the ownership of local WSS operators that provide services directly to local population, or by inviting private operators under PPP contracts.

C. Other aspects of WSS service delivery models

The above models of WSS service delivery are classified according to two key policy dimensions, namely the degree of delegation and the degree of consolidation. But these are not the only factors under consideration. To analyse the WSS delivery models deeper, one should use the following criteria:

- degree of agglomeration and regionalisation
- scope of services and the scale of operations
- degree of autonomy of the service provider
- technical and human capacity of the WSS service provision
- ownership of the WSS infrastructure
- customer services standards for WSS services
- quality and quantity of WSS services
- system for financing operations and maintenance and capital investments
- citizens’ participation in decision making with regard to WSS services
- private sector participation.
C. Business models under review and their applicability for small towns and rural areas in Kazakhstan

The table below summarises WSS business models under review existing in the EU and EECCA, and assesses their applicability for the small towns and rural areas in Kazakhstan.

<table>
<thead>
<tr>
<th>Business model</th>
<th>Example of countries where the business model is applied</th>
<th>Applicability for small towns and rural settlements in Kazakhstan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Degree of regionalisation of service provision</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decentralised model</td>
<td>Austria, Moldova, Poland, Russian Federation, France</td>
<td>The model does not create the required economies of scale or address the lack of capacity of water/wastewater operators. The decentralised model is applicable in remote and small settlements only.</td>
</tr>
<tr>
<td>Voluntary regionalisation</td>
<td>Austria, Romania, Moldova, Poland, Czech Republic, France</td>
<td>The model addresses the problem of economy of scale and thus applies in combination with the appropriate fiscal and economic incentives. The implementation time would be long.</td>
</tr>
<tr>
<td>Obligatory regionalisation</td>
<td>United Kingdom, Italy, Bulgaria, Romania (with very high incentives), Armenia</td>
<td>The model addresses the problem of economy of scale; however, in the situation of Kazakhstan, complementary business models should be used. The implementation time will be shorter than with voluntary regionalisation.</td>
</tr>
<tr>
<td><strong>Delegation of service provision</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service provided directly by local governments</td>
<td>Austria, France, Moldova, Poland, Russian Federation, Ukraine</td>
<td>The model is politicised and there is a lack of corporate governance in the model.</td>
</tr>
<tr>
<td>Service provided directly by neighbouring local government (but without creating an association)</td>
<td>Austria, Moldova, Poland, Russian Federation, Ukraine, France</td>
<td>The model is politicised and there is a lack of corporate governance in the model.</td>
</tr>
<tr>
<td>Service provided directly by neighbouring local government by creating an association for water service provision</td>
<td>Austria, France, Poland, Russian Federation, Ukraine</td>
<td>The model is politicised and there is a lack of corporate governance in the model. Legislation on municipal associations is required.</td>
</tr>
<tr>
<td>Service provided directly by non-incorporated local/regional public utilities or co-operatives</td>
<td>Austria, France, Poland, Russian Federation, Ukraine</td>
<td>The model is politicised and there is a lack of corporate governance. It can be applied as a first step before the incorporation of Rayonal Vodocanals.</td>
</tr>
<tr>
<td>Service provided directly by incorporated (limited liability companies or joint stock companies) local/regional public utilities</td>
<td>Austria, France, Poland, Russian Federation, Ukraine</td>
<td>The model is applicable especially around towns (by transforming Rayonal Vodocanals into limited liability or joint stock companies).</td>
</tr>
<tr>
<td>Community based organisation/co-operatives</td>
<td>Armenia, Georgia, Kyrgyzstan, Finland, Poland, Moldova,</td>
<td>The model is applicable especially in small remote rural settlements; it requires continuous support to CBOs/co-operatives.</td>
</tr>
<tr>
<td>Small private operators, including informal ones.</td>
<td>Moldova</td>
<td>The model is applicable, especially in small remote rural settlements.</td>
</tr>
</tbody>
</table>
### Business model

<table>
<thead>
<tr>
<th>Business model</th>
<th>Example of countries where the business model is applied</th>
<th>Applicability for small towns and rural settlements in Kazakhstan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Different levels of private sector participation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delegated services through the lease or concession model where public authorities retain ownership of WSS infrastructure</td>
<td>Czech Republic, France, Romania, Russian Federation, Italy</td>
<td>There is little experience on concession and leasing in WSS sector in Kazakhstan. The model would be applicable, but capacity building and amendment of legislation is required.</td>
</tr>
<tr>
<td>Management contracts</td>
<td>Armenia, France, Poland</td>
<td>There is no experience in Kazakhstan with management contracts. The sector is not attractive for private providers due to affordability constraints and tariff setting rules.</td>
</tr>
<tr>
<td>Full privatisation where private companies both own and operate the infrastructure.</td>
<td>United Kingdom</td>
<td>Currently, this model is not applicable in Kazakhstan.</td>
</tr>
<tr>
<td><strong>Multi-service utilities</strong></td>
<td>Russian Federation, Poland, Ukraine, Serbia, Italy</td>
<td>The model is applicable in towns where other municipal services are provided in the main town or in the entire rayon. The best approach may be to apply the model as a second step after regionalisation.</td>
</tr>
</tbody>
</table>

*Source: Authors’ own assessment.*
7.19. Results of the Reality Check

The Reality Check constituted an important phase of this study. The objective was to check the feasibility of recommended WSS business models in the context of Kazakhstan, by discussing them with key local WSS stakeholders. The Reality Check consisted of two parts:

1. a phase of consultation at the local level with selected communities and operators representing different WSS service delivery models in Kazakhstan, conducted in June and July 2015
2. a national WSS seminar in Astana conducted on 15 October 2014.

The activities of Reality Check were conducted in a number of communities representing the following WSS business models:

- the Village of Chundza, Ujgurskij Rayon, Almaty Oblast – an example of the Rayon Vodocanal model
- the Village of Kokozek, Karasajskij Rayon, Almaty Oblast – an example of the water user co-operative model, named “JelSuy”
- the Village of Belbulak, Talgarskij Rayon, Almaty Oblast – an example of the PPP contract for WSS services delivery
- the Town of Talgar, Talgarskij Rayon, Almaty Oblast – an example of group water main as a source of drinking water
- the Town of Talgar, Talgarskij Rayon, Almaty Oblast – an example of small town water utility.

In all the aforementioned communities, the project team met with representatives of rayon and village authorities, management of WSS operators and the local population, including WSS services customers. At the meetings, the applicability of the recommended WSS business models and their proposed improvements, were discussed, with a focus on the Rayon Vodocanal model and the complementary model of community management of WSS services. The main outcomes of these consultations are presented below.

Ujgurskij Rayon, Almaty Oblast has a population of about 65 000 people distributed in 25 rural communities. The Rayon Vodocanal “Ujgur Su Kubyry” in ten of those rural communities provides WSS services. The rayon administration plans on extending its service area to the entire territory of the rayon.

The above examples of the Rayon Vodocanal “Ujgur Su Kubyry” and the water user co-operative “El Suy” confirm that the two recommended business models are already functioning in Kazakhstan, although they have not yet been applied in the entire country; areas for improvement still remain.

* * *

In the opinion of representatives of both models, a Rayon WSS Development Plan would be a very helpful management tool for WSS development at the rayon level. In addition, they agree that for the models to be financially sustainable, they should provide affordable WSS services which need to be the subject of a financial and affordability analysis at the local level. As rayon administrations should have the
overall responsibility for organising the provision of WSS services, the village administration should be responsible for assisting the local population in establishing and managing water user co-operatives. The upfront investments in constructing WSS infrastructure should be borne by local authorities and the infrastructure should be subject to a concession agreement with the water user co-operative.

Based on very useful discussions during the first phase of the Reality Check, the findings and initials proposals of the study were further elaborated and draft recommendations were produced and presented at the national seminar (see Annex 7.20 below).
7.20 Report from the national WSS seminar in Astana on 4 November 2014

The national workshop on sustainable water supply and sanitation (WSS) business models for small towns and rural areas in Kazakhstan was held on 15 October 2014 in Astana, Kazakhstan in the Zhumbaktas Hotel. The national workshop was organised under the OECD Project “Sustainable WSS business models for small towns and rural areas in Kazakhstan” with the official support of the Committee of Architecture, Housing and Utilities, Land Resources Management of the Ministry of National Economy of the Republic of Kazakhstan, and the Water Recourses Committee of the Ministry of Agriculture of the Republic of Kazakhstan; and with assistance from the “Centre for Water Initiatives”.

Representatives from the ministries of national economy, foreign affairs, agriculture, energy, investment and development, and Akimat of Almaty Oblast, as well as from private companies, NGOs and international organisations in Kazakhstan participated in the workshop.

Workshop chairperson, Mr Begman Kulbayev, Deputy Director of the Committee for Construction, Housing and Utilities Land Resources, welcomed participants on behalf of the Ministry of National Economy of Kazakhstan. The current WSS business models practice in Kazakhstan and international experience in the sustainable WSS development were presented to participants. Namely, the OECD Project Team presented information on the prevailing WSS business models in small towns and rural areas in Kazakhstan, the lessons learned from international experience of EECCA and selected EU countries, as well as the conclusions and recommendations from the OECD project. Ms Ekaterina Strikileva, CAREC Project Manager, also presented CAREC’s experience in developing community-managed WSS. Mr Aidos Kobetov, Project Manager, JCS “Kazakhstan Centre of Public-Private Partnership” informed participants about the development of the legal framework for PPP arrangements in WSS sector.

On the basis of the received information, workshop participants discussed possible development options and necessary actions, including:

- the question of the adoption of a law on water supply and sanitation
- the issues related to multi-service utilities
- the management of drinking water infrastructure by rural consumer co-operatives
- the issues linked to the inventory and certification of water systems in the WSS sector
- the improvement of the tariff policy for environmental impacts in the wastewater sector
- the introduction of incentives for reduction of water consumption.

As a result of discussions, participants adopted a resolution, which includes the following recommendations:

1. To pass on the recommendations of the “Sustainable WSS business models for small towns and rural areas in Kazakhstan” project to the Committee for Construction, Housing and Utilities and Land Recourses Management of the Ministry of National Economy of the Republic of Kazakhstan, for their application in the formulation of WSS development policies.
2. To consider the opportunity of piloting/testing in certain areas the recommendations on the development of the rayon WSS development plan and creation of WSS rayon utilities, along with additional small-scale WSS systems, managed by local communities.

3. To improve the monitoring system for WSS development, especially in the rural areas of Kazakhstan, with an emphasis on institutional development.

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**7.21-23 Project-related missions**

The reports on project-related missions are accessible at the web-link: www.oecd.org/outreach/.

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1. The administrative and territorial organization of Kazakhstan is regulated by the Law on Administrative-Territorial Division of the Republic of Kazakhstan No. 2572-XII, adopted on 8 December 1993.

2. In 2004, the total number of rural communities was 7,511. In 2010, there were only 7,002 rural communities, as a result of the government’s administrative-territorial policy and programmes.

3. There are 86 cities in Kazakhstan with a total of about 9,436,900 residents: three cities with a population exceeding 500,000 (including one city with over 1 mln residents), 18 cities with between 100,000 and 500,000 residents, 6 cities with between 50,000 and 100,000 residents, and 59 small cities (towns) with a population under 50,000 residents (hereinafter referred to as small towns).


5. OECD Environment Statistics


7. In OECD member countries, the average domestic consumption is approximately 180 litres per capita per day. Source: www.oecd.stat.

8. The low levels of water losses should be subject to further analysis to confirm the accuracy of the data, as these estimates do not correspond to the fact that around 65% of WSS systems are in critical condition and require rehabilitation.

9. Water tariffs are regulated by the Agency for Regulation of Natural Monopolies of the Republic of Kazakhstan, which acts in accordance with the Law of the Republic of Kazakhstan dated July 9, 1998, No. 272-I: On Natural Monopolies and Regulated Markets. The methodology used for calculating water tariffs is outlined in Methodology for the Calculation of Differentiated Tariffs for Regulated Services of Water and Sewerage Systems, approved by the order of the Chairman of Agency for Regulation of Natural Monopolies on December 30, 2009, No. 419-OD. The legal framework regulating this activity includes the following acts:

- decree of the President of the Republic of Kazakhstan dated March 19, 2010, No. 58: On the State Program to Strengthen the Industrial and Innovative Development of Kazakhstan for 2010-14


12 In fact, the WSS business model of big farm and agriculture enterprise should be classified as the model of private operator under PPP contract, but as it has its own specific characteristics in the Kazakhstan environment it is presented here as a separate business model.

13 The legal basis for this is Section Five of the Law of the Republic of Kazakhstan: On State Property.

14 One city, Baikonur, leased by the Russian Federation, has a special status: the Kazakh authorities record it as an oblast city as part of Kyzylorda Oblast.

15 *Zhem* with a population of 1,942 persons is the smallest town in Kazakhstan.


17 For example, the Agency of Construction, Housing and Communal Utilities.

18 Including a guideline on elaborating and adopting Rayon WSS Development Plan (Master Plan) and on creating Rayon Vodocanal.

19 In this and the following case-studies the situation is presented as of January 2014.

20 In this report, the terms “WSS service delivery model” and “business model” are used as synonyms.