Optimisation of water systems in Ukraine

Study on regionalisation of water services

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1. The objective and scope of current work

2. Water utilities included in analysis

3. Small water companies – status and challenges

4. Regionalisation – initial results of regional company modelling
What is the problem?

• Small water systems face numerous challenges in their attempt to provide quality, affordable and efficient services to population

• The key criticisms for small water systems include:
  ✓ Poor operational efficiency and high unit costs
  ✓ Limited access to investment capital
  ✓ Sub-optimal utilisation of water resources

• Consolidation (regionalisation) is frequently considered as logical approach in trying to resolve the problem
Objective

- Quantitatively assess individual water companies vis-a-vis Regional Water Company
- Provide concrete implications for potential effects of regionalisation in terms of costs, tariff implications
- Outline the key priority areas for Regional Authorities if going for regionalisation
Selection of the region

- Initially 2 regions:
  - Autononomous Republic of Crimea
  - Cherkassy oblast

- Preliminary meetings with local administrations has been carried out and questionnaires distributed for data collection

- Data collection – proved to be a major CHALLENGE

- After number of attempts and delays Crimea region has been replaced by Kiev oblast

- Results from analysis in Kiev oblast are presented today
Kiev oblast

- North-central region of Ukraine
- One of 24 oblasts in Ukraine (3.7% of population and 4.5% of territory)
- Split into two halves by river Dnipro
- Geographically uniform
  - small mountains and hills only on the banks of Dnipro
  - 177 rivers intersecting in the region (Dnipro, Pripyat, Desna)
- 25 cities and more than 1,100 rural settlement with population of 1.7 mln
- Population rather equally distributed across Oblast with average density of 65 prs/km2
- Every city is operated with its individual water and wastewater company
- Oblast is governed by the Kiev Oblast Rada
10 water companies

375,000 total inhabitants 83% coverage

290,000 multistorey buildings, 85% coverage

85,000 private housing 75% coverage

- all water companies provide combined Water and Wastewater related service
- water quality, regularity of service is similar across cities
- operate within the boundaries of Kiev region
- identical water source and landscape characteristics
- subject to same institutional and regulatory environment
Key characteristics/issues

- Year-to-year financial result - **negative**
- Physical water losses - **35% and more**
- Energy consumption high - **1kWh/m³ of abstracted water**
- Total direct O&M cost - **5 UAH/m³ (0.46 EUR/m³)** of abstracted water
- Employee efficiency - **1 employee/200 connected inhabitants**
- Infrastructure – almost **50% fully depreciated**
- Maintenance works - **minimal**
- None of the companies in the sample is able to finance serious investment programme – hardly cover O&M expenses
- Almost none of the companies in the sample is able to attract serious external credit financing for investments:
  - poor revenue basis
  - small size versus high transaction costs
Household tariffs – current situation

- Within boundaries of the same region on a short distance from each other, tariff in cities, which are frequently almost of the same size, may differ as much as 3-5 times.

- Rarely has anything to do with cost – political power and influence.

![Bar chart showing household water tariffs and household wastewater tariffs for different cities.]
- Share of income paid for water and sanitation services also differs across individual water companies

- Affordability data are shown only for households with installed water meters
Summary

- Each water company develops its independent solutions, which are of "immediate problem solving" nature and short term oriented
- Not capable to address fundamental issues - infrastructure, water resource management, financial planning, operational efficiency
- Add hoc "save the day" approach results in:
  - highly differentiated tariff structure for similarly poor quality of service
  - vicious cycle – increasing costs, upward pressure on tariffs, lower service levels
Financial positions – over time

- Required tariffs increase from current levels in order to sustain water companies at the cost recovery level (including basic maintenance):
  - **13-15% annually**, 2012-2015
  - **10-12% annually**, after 2015
Regional water company

- Assumed:
  - based on 10 water companies in the sample
  - serves all customers in the service zone of 10 companies
  - technical and financial data of Regional Company derived either as total sum (of individual companies (water abstraction, consumption, losses)
  - Tariffs, collection rate, household incomes modeled as weighted average of individual water companies
  - Regionalisation implies "unified management and governance" of water company
    - administration, tariff setting, planning, monitoring
    - financing, accounting, reporting
  - Former water companies remain as individual operational units governed from a central regional body
Tariff: full cost recovery, financial sustainability

- Stable uniform tariff for the regional company

![Bar chart showing water and wastewater tariffs in different cities.]

- Water tariff, population, UAH/m³
- Wastewater tariff, population, UAH/m³
- Water tariff REGIONAL, population, UAH/m³
- Wastewater tariff REGIONAL, population, UAH/m³
Pro-active regional company

- Investment programme, operational safety - **400 mln UAH (36 mln EUR)**
- Capable of accessing credit market (mix of credit/grant funds)
- Implementation period 3 years, 2012-2014
- Estimated:
  - Cost optimisation (conservative **1 staff/350 connected** population)
  - Energy saving **15-20%** of current
  - Water loss (physical) reduction – **30%**
- Does not include many other benefits that can be quantified as having material impact
  - increased purchasing power and therefore lower cost of material
  - cost sharing between high and low cost towns – equalisation of tariffs (higher collection)
  - more effective approach to environmental protection and enforcement of standards within single entity (lower environmental penalties)
• Full economic and financial model for regional company has been developed for the period of 15 years going forward

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<th>Tariff increase</th>
<th>Impact</th>
<th>Affordability</th>
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<tbody>
<tr>
<td>Individual water companies</td>
<td>13-15% (10-12%)</td>
<td>Preserve status quo</td>
<td>0.3%-4.8%</td>
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<tr>
<td>Regional water companies</td>
<td>11-13% (9-11%)</td>
<td>Major infrastructure and cost structure optimisation,</td>
<td>0.025</td>
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Conclusions

- In the context of Ukraine, regionalisation has more **urgent meaning** – preventing water sector from collapse and serious service deterioration.

- Operational inefficiencies, wasteful resource utilisation, poor condition of assets are **widespread challenges** for almost every water company.

- Left alone with such problems, small municipalities struggle in finding "their own solution to the problem", which results in highly differentiated market for the same product in the same region.

- Regionalisation can work, but it have to be well planned and systematically implemented:
  - short term: cost optimisation plans
  - mid-term: capital investment planning and implementation
  - mid, long-term: optimisation of water resource use
Thank you!