Financing Experiences in Non Revenue Water Management

Pier Francesco Mantovani
Lead Water Supply and Sanitation Specialist
Water Global Practice, Europe and Central Asia

Regional Workshop on Capacity Development, Water Operators Partnerships and Financing for Non-Revenue Water Management
7-9 July 2014, Dushanbe, Tajikistan
Relevance of Non Revenue Water

• NRW seriously affects financial sustainability of utilities through lost revenues and inflated operating and capital costs.

• High NRW is a symptom of poorly run utility that does not make good use of its resources

• NRW exacerbates pressures on water resources, as potable water demands grow but water resources are getting scarcer.
IWA Water Balance

<table>
<thead>
<tr>
<th>System Input Volume</th>
<th>Authorised Consumption</th>
<th>Billed Authorised Consumption</th>
<th>Billed Water Exported</th>
<th>Revenue Water</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Billed Metered Consumption</td>
<td>Billed Unmetered Consumption</td>
<td>Non Revenue Water</td>
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<tr>
<td></td>
<td>Unbilled Authorised Consumption</td>
<td>Unbilled Metered Consumption</td>
<td>Unbilled Unmetered Consumption</td>
<td></td>
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<tr>
<td>Water Losses</td>
<td>Apparent Losses</td>
<td>Unauthorised Consumption</td>
<td>Customer Meter Inaccuracies</td>
<td></td>
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<tr>
<td></td>
<td>Real Losses</td>
<td>Leakage on Transmission and Distribution Mains</td>
<td>Leakage and Overflows at Storage Tanks</td>
<td>Leakage on Service Connections up to point of Customer Meter</td>
</tr>
</tbody>
</table>

Source: IWA

Importance of measurements to design a NRW reduction strategy
Vicious and the virtuous circles of NRW

Source: Farley, 2008, The Manager's Handbook to Non Revenue Water
Both NRW and wasteful demands contribute to inefficient water usage and inflated costs.

High Non-Revenue Water (%)

Excessive Unit Demands (liter/capita/day)

Source: IBNET 2014, Self-reporting by participating utilities (non representative sample)
Why do utilities struggle with NRW reduction?

- Not understanding the problem (magnitude, sources, costs,..)
- Lack of capacity (staff, data strategy)
- Inadequate infrastructure funding (pipes, meters,..)
- Lack of management commitment
- Weak enabling environment and performance incentives
Limited regional experience in NRW reduction

<table>
<thead>
<tr>
<th>Project</th>
<th>Scope</th>
<th>Results</th>
<th>Observations</th>
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</table>
| Uzbekistan - Bukhara & Samarkand Water Supply (2003-2010) | $40m, with 3-year Service Contract | • Improved safety, reliability and quality of service.  
• Marginal reduction in water losses & energy inefficiencies.  
• NRW gains linked to improved customer registration and billing  
• Partial meter coverage | • Ineffective PPP  
• Priority to service safety continuity investments.  
• No NRW strategy, data uncertainties.  
• Rated **Moderately Unsatisfactory** |
| Tajikistan - Dushanbe Water Supply (2002-2011 including additional financing) | $25m, with 3-year Service Contract | • Improved reliability and quality of service.  
• Marginal reductions in water losses & energy inefficiencies. No metering  
• Improved collections | • Ineffective PPP  
• Priority to service safety/continuity investments.  
• No NRW strategy, data uncertainties  
• Rated **Moderately Unsatisfactory** |
| Armenia – Yerevan Water and Wastewater (2005-2011) | $20m, with 10-year lease contract | • Achieved most performance objectives, incl. reliability, quality of service, energy efficiency  
• Limited NRW gain from 86.3% to 82.6%. | • Successful PPP  
• Good knowledge transfer  
• Strong government commitment to sector reform  
• Rated **Moderately Satisfactory** |
Potential for private sector expert assistance

- Classic Public-Private Partnership approaches (Concessions, leases, management contract)
- Outsourcing of specific NRW reduction tasks (leak detection & reduction, meter program, cadastre, customer database upgrade,..)
- Performance-based contracts

Best practice: Recife and Victoria (Brazil)

“Manual for Performance-Based Contracting by Water Utility Companies in Brazil” (World Bank/IFC)

- Strategies for partnerships either between public companies or between public and private companies
- Roadmaps for NRW and Energy Efficiency strategies
- Guidelines on performance contracts with respect to: NRW reduction and Energy Efficiency