

Water efficiency and effective water management – a shared responsibility

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THE PROBLEM

Water Scarcity is among the main problems to be faced by the World in the 21st century (Pereira *et al.*, 2009). It occurs when so much water is withdrawn that supplies can no longer adequately satisfy all requirements, resulting in competition among potential users. However, there is more than enough water in the world (UNDP, 2006). Although water scarcity is shaped by where and how nature delivers water, it is inadequate water management which is ultimately responsible for water shortages. In the developing countries alone, every day more than 45 million m³ of drinking water are lost in the water distribution systems, a quantity that could serve nearly 200 million people (Liemberger, 2007). Water loss occurs both in the developed world and in developing countries, but it is a serious issue in areas where water is scarce.

REASONS

Climate change and population growth are expected to exacerbate water scarcity. Many aquifers have been over-pumped and water has become polluted. The proportions of irrigated land and water used for industry have been growing continuously and dramatically. Due to the inexorable growth of cities an increase in domestic use can be observed globally. Under these circumstances it is difficult to understand that so much water is lost through leakage or theft. Many of the reasons for water loss are based on human failings, lack of maintenance and the technical and managerial skills necessary. Most of the water industry in many parts of the world accord water loss only secondary priority since the true economic and social impact has not yet been realized. The total cost to water utilities is estimated at \$15 billion/year (Liemberger, 2007). Water loss suffers from a lack of good auditing practices and a failure to reduce leakage proactively (Thornton *et al.*, 2008).

SOLUTIONS AND TOOLS

In order to analyse priority issues and gaps an analysis has been carried out based on questionnaires provided to 19 cities worldwide (Bley & Klein, 2009). The results show that in all successful cities stable socio-economic conditions facilitate appropriate measures to ensure the provision of reliable public services. A long-term strategy of combining innovative IWRM, applying appropriate technical standards and tools for maintenance and metering and capacity development can deliver reduced water losses around or even well below 10% as a “side effect” at reasonable costs (Fig. 1). In Europe and North America abstraction is falling despite continued expansion of industrial output; this can be attributed to attempts at reducing water costs, the “polluter pays principle” and the introduction of more water-efficient technology. Public water supply in Eastern Europe has declined since the early 1990s due to the introduction of metering and higher water prices. However, the biggest part of the increase in demand for water in the future could be met by increasing the effectiveness of irrigation (e.g. drip irrigation). To overcome competition between sectors, new integrated (urban) water management concepts are needed, focusing on concepts between the urban and the peri-urban and the surrounding communities (including circular systems).

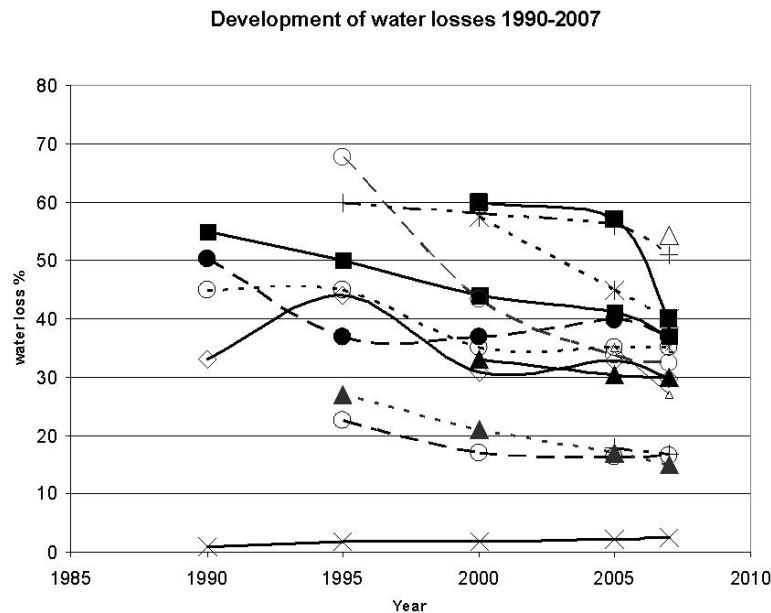


Fig. 1 Development of water losses 1990–2007 in 19 cities worldwide (Bley & Klein, 2009).

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REFERENCES

- Bley, D. & Klein, G. (2009) Country analysis report. In: *Drinking Water Loss Reduction: Developing Capacity for Applying Solutions* (ed. by R. Ardakanian & J. L. Martin-Bordes) (Proc. of International Workshop, Bonn, September 2008).
- Liemberger, R. (2007) *Performance based Non-Revenue Water Reduction Contracts*. IWA Specialist Conference, Bukarest, September 2007.
- Pereira, L. S., Cordery, I. & Iacovides, I. (2009) *Coping with Water Scarcity – Addressing the Challenges*. Springer, Germany.
- Thornton, J., Sturm, R. & Kunkel, G. (2008) *Water Loss Control*. McGraw-Hill, USA.
- UN (2003) World Water Development Report 1, Water for People, Water for Life. UNESCO-WWA.
- UNDP (2006) Human Development Report. New York, USA.