Towards More Sustainable Water Systems

A Swiss research team has constructed and analysed three scenarios about possible futures of the waste water management in Switzerland. The results underline the need to improve water system organisation and technological innovation implementation to provide a more sustainable water management.

Water pollution is one of the major environmental issues in Europe. Improving urban waste water management necessitates the involvement of both water system managers and scientists and to make them agree on shared strategic priorities.

A Swiss research team has recently attempted to identify the research priorities to guarantee long-term sustainability to the Swiss water systems. They used scenario analysis, a powerful tool for framing strategies in decision contexts that are marked by high uncertainties. Firstly, the authors carried out a literature survey and expert interviews to identify the key factors driving changes in the water sector. Workshops involving system managers and water scientists were then settled to draw scenarios about possible pathways of evolution for Swiss urban water systems. Finally, the authors summarised the different research priorities in order to improve the sustainability of Swiss urban water systems.

The literature survey and expert interviews led to the identification of 56 factors driving the evolution of water systems. Then, the uncertainty of the future state and of the relevance of each factor was assessed during two successive workshops involving water system managers and scientists. These workshops allowed to reduce the list to 15 factors and enabled the participants to draw three scenarios. These scenarios do not predict the future of the Swiss urban water systems, but serve as a tool to support systematic thinking and to identify options in order to be prepared for possible futures:

- **Scenario A** suggests a reorganisation of management systems at a regional scale by merging the current 4,000 water companies into 250 only. The authors assume that this reorganisation would enhance the efficiency and professionalism in the water sector.
- **Scenario B** is based on consequent material flow management leading to technological innovations and a radically restructured urban water management system with a significant improvement of wastewater recycling and a reduction of pollutants emissions.
- **Scenario C** evaluates the impacts of a financial crisis of the water companies, based on organisational deficiencies combined with a strong political demand of water pollution control. In this situation, the authors suggest that the only solution to maintain the water systems would be a reorganisation, increasing efficiency and professionalism in the water sector.

On the whole, the authors underline that water system managers are mainly focused on increased professionalism as described in scenario A, whereas scientists underline the need of technological, system, and social innovations to increase the sustainability of the water sector. However, both water system managers and scientists agreed on the necessity to increase the efficiency and the flexibility of the water systems.

The authors conclude that the scenario building approach enabled water system managers and scientists to clarify their respective positions about the Swiss water sector. A similar approach could be applied for a more efficient and sustainable water management in Europe.


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**Additional Information:** As an example of technological innovations to increase the sustainability of the water sector, LIFE is co-financing a project in Finland (LIFE03/ENV/FIN/237) to use industrial wastewater as a carbon source, instead of methanol or another external carbon source, to improve nitrogen removal in municipal wastewater treatment. Using this approach as well as introduced biological activation carriers and intermittent dissolved air flotation, the aim is to achieve nitrogen removal efficiency of >70% with 6 hour retention time, and minimal increase in space needs of the existing underground plant. Current cost indications are favourable as compared with more conventional upgrading. The project will continue until the end of 2006. For more information see the project summary.

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