

## Lektioita

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# Quest for sustainable urban water services – Management and practices in Finland

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Clean water environment ensures safe and enjoyable water services, fishery, agriculture, recreational water use, bathing and landscape. In Finland water services work generally well, but still there are some undesirable situations annually. According to Finnish legislation, municipalities are responsible of water supply and sanitation inside population centres. Municipalities may take care of water services by themselves or outsource it to private companies. Usually municipalities establish their own water utilities for the task. The water utilities might be municipally owned enterprises or companies. Water quality requirements are given by WHO, EU or national authorities. Water utilities take care of investments, operation and maintenance and invoice the costs in water fees.

Water services are a vital part of socio-economic functions. Although water is considered as a necessary human right to everyone, it is not even close to adequate in several countries. Globally more than 2 billion people lack safe drinking water and 4.5 billion people are without satisfactory sanitation facilities (World Health Organization & United Nations Children's Fund 2017). This is not a satisfactory situation, and the United Nations Sustainable Development Goals (SGDs) specifically include Goal number 6 for Water supply and sanitation. This Goal is quite clear, from the title *”Ensure availability and sustainable management of water and sanitation for all”*, to the sections 6.1 *”By 2030, achieve universal and equitable access to safe and affordable drinking water for all”* and 6.2 *”By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations”*.

There are huge differences between available water resources, access to them, use of water resources, organizing of water services and institutional framework in overall water management. Hence, it is quite impossible to give specific common guidelines for water management, yet there are some principles and practices that can be applied in planning of water resources use and especially water services provided and produced to citizens of communities and a society.

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In recent years we are often faced with alarming news on water crisis in the major cities around the world (*e.g.* Chennai, India, and Cape Town, South Africa). Such situations are very likely to be more common in the future due to climate change which will strongly impact especially the most vulnerable people. This is due to water scarcity and changing circumstances which can be resisted by sustainable development and resilient practices in water resources management. Sustainable water services, meaning continuously secure and resilient urban water supply and sanitation for all in communities, are not only an issue of natural resources and technology to use them but a wide socio-economic collaboration between all stakeholders covering decision-making, preparation of legislation and policy, technological development, operation and maintenance of infrastructure, financing, and, last but not least, the whole society as users of water resources and services (*e.g.* Katko 2016).

Municipalities are not responsible of water services outside population centres in Finland. Households take care of their own water supply and sanitation for example with boreholes and on-site sanitation systems. In quite several occasions rural communities establish water cooperatives and run water services by themselves. Coverage of organized water services in Finland is quite high, more than 90 percent of people have water supply and more than 80 percent of people have organized sanitation.

Poorly managed water services cause problems to health and environment. Water is one of the basic necessities in life, but it is still not constantly available to a large part of the world's population. Water scarcity is a serious problem in some parts of the world, and water and sanitation services that depend on human will and resources are also often poorly managed. This situation regularly causes severe health, environmental and economic impacts, all of which are producing major problems for both individuals and communities in low and even middle income economies.

One important principle in sustainable water services is full cost recovery. Main costs of a water utility are investment, personnel, energy, chemicals and maintenance costs. Municipal water utilities invoice often combined drinking water and wastewater fee.

- Connection fee, for investment
- Fixed monthly fee, for fixed costs of the water utility
- Consumption fee €/m<sup>3</sup>

Average fee for one household house is about 5 €/m<sup>3</sup> and for apartments about 4 €/m<sup>3</sup>. Average water consumption is 130 l/d/person, this means that monthly water bill is about 2 % of the households total income (4 persons, 2 working).

As summary of this research, institutional framework of sustainable urban water services was studied by sequential PESTEL and SWOT analysis. PESTEL gives a possibility to systematically review political, economic, social, technological, environmental and legal framework of a function in a society.

- Political Factors: including pressures and opportunities brought by political institutions and the degree of the impact of government policies on water sector.
- Economic Factors: including economic structures and to what extent the economy impacts decisions can influence the trend for sustainable and resilient water services.
- Social Factors: including cultural aspects, attitudes, and beliefs that will affect the demand for adequate water services for all.
- Technological Factors: including technological aspects, innovations, barriers and incentives, and what kind of an impact these have on creating sustainable and resilient water services.
- Legal Factors: laws, regulation and legislation that affect the operation of water utilities.
- Environmental Factors: ecological and environmental aspects that will affect urban water services.

Analytical tools PESTEL and SWOT are widely used in strategic planning, decision-making and action planning (UNICEF 2015). When used sequentially, the tool is stronger in identifying the internal and external factors. In urban water services these factors are also significant to assess. Various factors might be difficult to identify as internal or external, as well as whether their effect is positive or negative. Hence, in this study, sequential PESTEL and SWOT analyses were used for recognizing all PESTEL factors that affect urban water services and for finding a way to describe significant aspects in Integrated Urban Water Management (IUWM). After that SWOT analysis gives answers how to develop this function to serve the society. The strengths in Finnish water services were discovered as political stability, economic and financial system and resources, good governance, educated and skilled personnel in water utilities, awareness and proper data management and smart water systems. The challenges are deteriorating water pipe and sewer networks and asset management. One feature in Finnish water sector is a large number of water organizations. In a country of 5.5 million inhabitants, we have 1100 official water utilities and almost 1000 informal water consortiums. This leads to scattered and inefficient use of resources.

Opportunities in Finnish water services can be described as government and municipal policies, stakeholder needs, economic situation, management and operation, educated and skilled personnel, future legislation, international agreements and cooperation, new technologies and health and environmental issues. Main external threats are climate change and municipal resource allocations due to local political situation.

How to keep the good situation and develop it to better serve people in communities. Some recommendations are constructed according to the studies included in this dissertation.

1. Institutional framework consistent
2. Full cost recovery in pricing policy
3. Good governance
4. Better organizational setup
5. More flexibility in working in water utilities
6. Proper data and knowledge management
7. New technology to be introduced
8. Education and continuous training

## References

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## Dissertation

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