Public-Private Partnership in Finnish Water Services

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In Finland, municipalities are responsible for water and wastewater services. Finnish centralised water and wastewater services have been run by municipalities since the first piped water supply schemes were built in the late 1800s. Finnish rural areas have a long tradition of private, consumer-owned and managed water systems that operate on a small scale on a non-profit basis. Municipally run water distribution and sewerage networks were built only in population centres while those living in rural areas had to come up with their own water supply and sewerage systems.

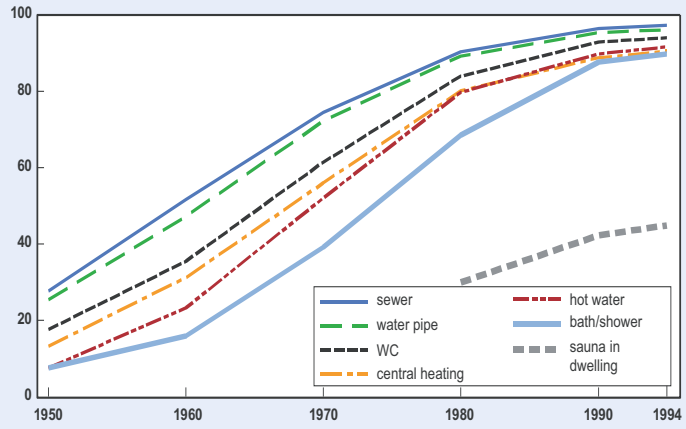
In Finland, the involvement of the private sector in the production of water services takes place mainly in two ways: 1) competitive tendering (the public sector is required to invite a compulsory tender usually from private enterprises for specific service production), and 2) outsourcing (the public sector contracts the private sector to produce specific services). In practice this means that strictly speaking public-private partnership does not exist as it is commonly understood, but rather public-private co-operation.

A special feature of Finland is that there are numerous – close to half a million – holiday residences (summer cottages) in rural areas, typically by lakes, which used to be inhabited only during summer holidays, but are nowadays increasingly used the year round. These buildings are outside population centres and thus have to rely on their own water supply systems.

In international comparison, with regard to water services, Finland is blessed with abundant water resources and a relatively low population density (16 inhabitants/km2). The country's available water resources amount to over 20,000 m3/per capita, and only two percent of the renewable water resources are in use (Pietilä 2005, 77). The water services infrastructure is relatively new and well maintained. Municipal and industrial wastewater treatment is of a high European standard. However, the watercourses in Finland are very sensitive; lakes are shallow and coastal areas are fragmented into thousands of islands. Thus, very effective wastewater treatment is required to preserve water quality, and increased nitrogen removal is necessary in many localities.

Figure 1

Water-Consuming Amenities of Finnish Dwellings from 1950 to 1994



Source: Katko (1997), p. 58.

Water supply

The development of centralised water supply, sewerage and wastewater treatment has been remarkably fast in Finland. In 1950 only 25 percent of the Finnish population received piped

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The largest water suppliers in Finland in 2004

City	Population served	Water supplied million m^3/year
Helsinki	920,000[a)]	80
Espoo	220,000[b)]	20
Tampere	200,000	20
Vantaa	180,000	16
Turku	175,000	17
Oulu	125,000	10

[a)] Includes residents of neighbouring municipalities. – [b)] Excludes water supplied to neighbouring municipalities.

Source: Pietilä (2005), 78.

water into their homes – by 1980 this figure had jumped to 90 percent (Figure 1).

In Finland, each municipality typically has its own water and wastewater utility. The largest municipal water utilities are shown in the Table. In addition to roughly 400 municipal utilities, there are more than 1,000 co-operatives and various forms of supramunicipal co-operation, in particular for bulk water supply and wastewater treatment. The largest bulk water supplier is the Helsinki Metropolitan Area Water Company which supplies water to about one million people (20 percent of the population of Finland) in eight municipalities.

Wastewater treatment

The first wastewater treatment plants for urban areas in Finland were built in the 1910s. Until the 1950s, only few wastewater treatment plants were in use, and pollution control was based on the natural self-purification capacity of watersheds. The Water Act of 1961 enabled authorities to set legal requirements and time schedules for water polluters (Katko 1997, 59). This put pressure on municipalities to reduce wastewater pollution loads, and the 1970s, in particular, was an extremely active period in wastewater treatment plant construction (Figure 2).

Finland has seen a gradual development towards larger units in wastewater treatment, especially in the Helsinki metropolitan area. In the 1970s the city of Helsinki, with a population of about half a million, had 11 wastewater treatment plants. Since 1994 all the wastewater of the city has been treated in a single treatment plant which also purifies the wastewater from five neighbouring municipalities, thus serving a total population of 750,000 people. The longest conveyance distances to the treatment plant are in the region of 50 kilometres which seems to be the maximum viable distance in Finnish circumstances (Helsinki Water 2007).

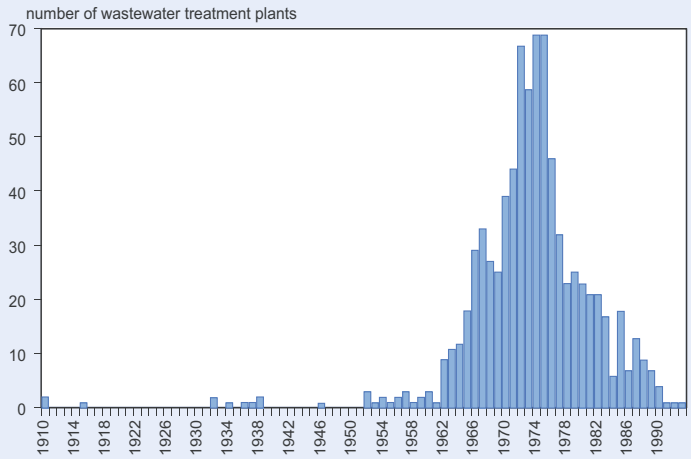
Water utilities and industries discharging wastewater have to apply for an environmental permit for their wastewaters. Typically, permits are granted for a five-year period, and so far the trend has been toward increasingly tighter requirements for wastewater effluent quality. Except for nitrogen removal, Finnish wastewater discharge permits are generally tighter than the requirements of EU directives.

The largest water user in Finland is and has been the pulp and paper industry which uses four times more water than the 5.2 million residents of the country. Consequently, the initial wastewater pollution loads from this industry have been much larger than the pollution from residential sources. The Water Act of 1961 gradually pressured forest industries, however, to reduce their loadings to watercourses. The development has been remarkable – since 1970 their production has more than doubled while the total loadings to receiving waters have been reduced to less than one twentieth (Figure 3). Thus, the load per one ton produced has fallen to less than two percent compared to 1970.

Unlike several other countries, the Finnish state does not subsidise the construction or improvement of larger wastewater treatment plants. The responsibili-

Figure 2

CONSTRUCTION OF URBAN WASTEWATER TREATMENT PLANTS IN FINLAND DURING 1910–1994

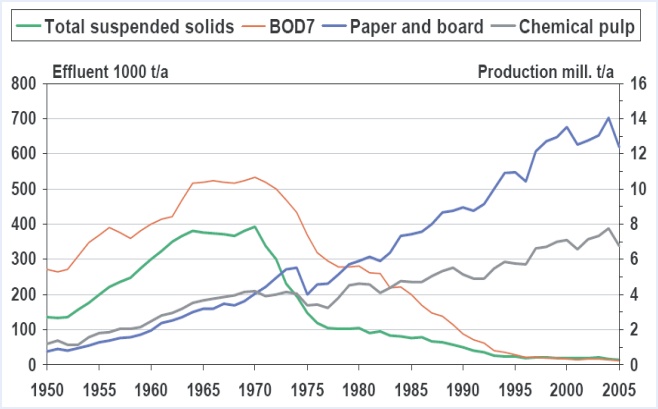


Source: Lehtonen (1994), p.64.

ty for their financing lies entirely on the municipalities and their water utilities and companies. State subsidies are available only for the improvement of water services in rural areas, or to support co-operation between rural municipalities. In 2004 the total state support to water and wastewater services in Finland was only EUR 10 million, a mere four percent of the total annual investments of around EUR 240 million in the early 2000s (Pietilä 2005, 81).

Figure 3

PRODUCTION OF PULP AND PAPER INDUSTY AND RELATED WASTEWATER LOADS



Source: Finnish Forest Industries Federation (2007).

Rural areas will see much development in wastewater treatment and on-site sanitation during the next ten years. The Decree on Treating Domestic Wastewater in Areas outside Sewer Networks (2003) clearly states that the traditional solution of a three chamber septic tank is no longer sufficient for individual households or summer cottages, and something more efficient has to be introduced by 2014. There are altogether 200,000–250,000 rural properties which have to improve their wastewater treatment facilities (Pietilä 2006, 76).

In Finland stormwater collection and disposal was typically the responsibility of the water and wastewater undertaking even before the Water Services Act of 2001. The costs of these activities are in most cases covered by wastewater charges. The question whether water and wastewater undertakings should be released from their responsibility for stormwater drainage, and the services provided by other means, has been raised recently.

Water co-operatives

In the rural areas of Finland co-operatives have been, and still are, a common means of organising water supply. Water co-operatives have a long history in Finland – the first were established already one hundred years ago (Katko 1997, 38). Rural municipalities established piped water supply systems to cover the built-up centres of the municipalities, but they could not afford extending water distribution to sparsely populated, predominantly farming areas, outside the centres. Particularly western Finland has large areas where groundwater resources are scarce, there are very few lakes, and river water is often not of good quality due to soil conditions. The flat topography was favourable for farming, but cattle required large volumes of water of good enough quality. Thus people joined forces to draw water from distant sources since it made sense to work together towards a common goal. Co-operatives had been established earlier for other joint undertakings and became commonplace also in water supply.

Some Finnish co-operatives are quite large serving more than 10,000 people. In many rural municipalities the water co-operative is the only water service organisation which also supplies the centre of the municipality as the municipality itself has no water supply unit.

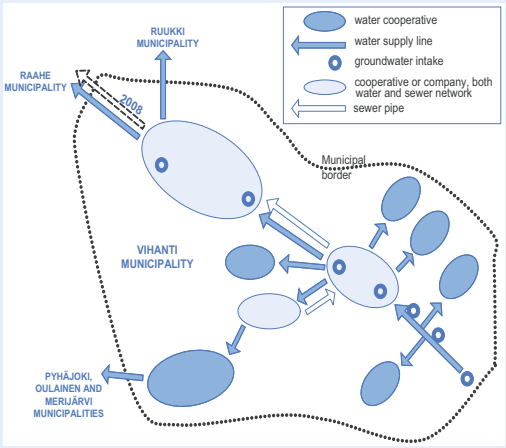
In the beginning water co-operatives were typically established for water supply and distribution purposes only, but over the years many co-operatives have expanded their services to sewerage and wastewater treatment. The municipality of Vihanti is an example of innovative water and wastewater service arrangements based on the people's own initiatives. Co-operatives still play an important role in 2007, even though many of the activities are now carried out by a bulk water supply and service company. The water and wastewater service arrangements of Vihanti are described in more detail in Figure 4.

Water co-operatives in Vihanti

Vihanti is a Finnish rural municipality with a population of 3,500, of whom roughly half live in the urban-type centre of the municipality. The traditional farming-based economy was complemented by

Figure 4

WATER SUPPLY AND SEWERAGE ARRANGEMENTS IN VIHANTI MUNICIPALITY



Source: Pietilä (2006), p. 81.

mining activities from 1950 until 1992. Vihanti is located in western Finland 600 km north of Helsinki. Until the end of the 1940s there were no organised water supply and wastewater services in Vihanti with the exception of a public well and a main sewer in the middle of the village (Kotila 1989, 24).

The first centralised water distribution and sewerage system was built by the mining company when mining activities started in the early 1950s. Water for the mining village and mining activities was taken from a groundwater source close to a neighbouring village. The mining process needed a large volume of water which caused the groundwater table to sink considerably. As a consequence, some private wells dried, and the mining company had to extend the piped water supply to the affected houses. Thus, quite a few people in the neighbouring village received a piped water supply free of charge (Kotila 1994, 65).

Elsewhere in the municipality a centralised water supply started in 1957 when Vihanti Water Co-operative was established to serve the municipality's central township. The scheme included both water supply and sewerage, but not wastewater treatment. The initiators of this co-operative were residents of the township, all private persons. The municipality of Vihanti joined the co-operative only a few years after its establishment, even though the municipality owned some property, such as an old people's home, within the operating area of the co-operative (Kotila 1994, 65).

During the 1960s and the 1970s several other water co-operatives were established in the municipality, especially in areas where water was supplied through the mining company's pipeline. By 1985 altogether twelve water co-operatives operated within the municipal boundaries. By the mid-1990s almost 100 percent of the households in the municipality either received piped water or could be easily connected to centralised water supply (Kotila 1994, 66).

The municipality of Vihanti is blessed with abundant groundwater resources, and in order to utilise them, the three largest water co-operatives and the municipality established a private company, Vihanti Water Ltd, in 1977. The company supplies water to the local co-operatives, industry and currently also to five neighbouring municipalities. In 1994 the sewer networks and three wastewater treatment plants were brought under Vihanti Water Ltd (Kotila 1994, 66). In 2008 a new regional wastewater treatment plant in Raahe, some 40 kilometres away, will be completed and wastewaters from Vihanti will be pumped to this new plant for treatment.

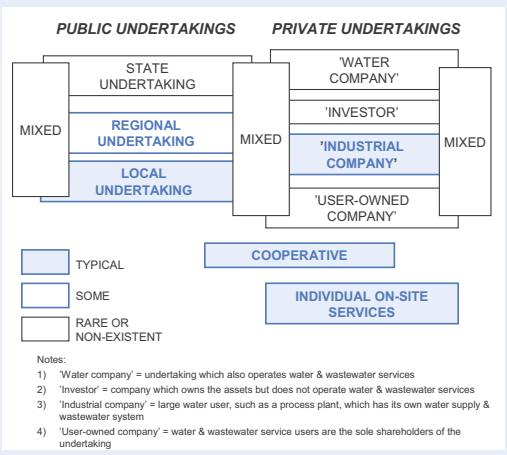
Presently Vihanti Water Ltd also has management contracts with the three largest co-operatives to operate and maintain their water supply, distribution and sewerage systems. These co-operatives also have their own groundwater intake facilities which are operated and maintained by the staff of Vihanti Water Ltd (Kotila 2006).

Public-private and public-public co-operation in water and wastewater services

Figure 5 illustrates various forms of ownership of water and wastewater service providers grouped

Figure 5

OWNERSHIP OF WATER SERVICES IN FINLAND



Modified from Pietilä (2006), p. 114.

under public or private. There are also a number of forms of joint public-private ownership. In Finland, the overwhelming majority of water service producers, as shown by the shaded areas in Figure 5, fall under "local undertaking", "co-operatives", and "individual on-site services". Additionally, there are several regional bulk water supply companies, some regional sewerage or wastewater treatment utilities, and one regional water and wastewater company. Pulp and paper industry plants use such huge volumes of water that they have their own water supply arrangements independent of municipal water supply.

Finland has long and extensive experience of public-private co-operation in the water supply and sewerage sector, although perhaps not of the type that it is too often understood to be (i.e. privately financed initiative projects or concession contracts). Outsourcing of the services, especially non-core operations, of public water undertakings is very extensive in Finland. Outsourced services can be as much as 60 to 80 percent of the undertaking's turnover (cash flow) in many public undertakings. The contract period is purposely relatively short, such as three years, in order to maintain real competition. Contract periods that are too long can eliminate potential competitors and thus reduce competition in the next round. Private companies incur nearly 100 percent of the capital expenditures of Finnish water systems. It can be argued that in Finland, where water utilities are publicly owned, the elements of private sector competition are far better utilised than, e.g., in England, where the water sector is 100 percent privatised (Pietilä 2006, 78).

However, municipal companies do not outsource all activities that they could. For instance, Helsinki Water considered engaging a private contractor to replace consumer meters that are removed for checking every five to ten years, but decided to leave this task to its own staff. The company wanted to "show its face" to its customers since the plumber replacing the meter is more or less the only representative of the water company the customer comes into contact with now due to electronic billing. This also enables the plumber to collect valuable first-hand feedback from customers.

The first, and by May 2007 the only, actual private operator contract was signed in 2002 for rehabilitation and operation of a municipal-industrial wastewater treatment plant in Haapavesi town. A local dairy and Haapavesi town awarded a 12-year contract to a project company, with majority private shareholding, to rehabilitate and operate the treatment plant. The value of the rehabilitation is about EUR 2 million (Seppälä 2003, 95).

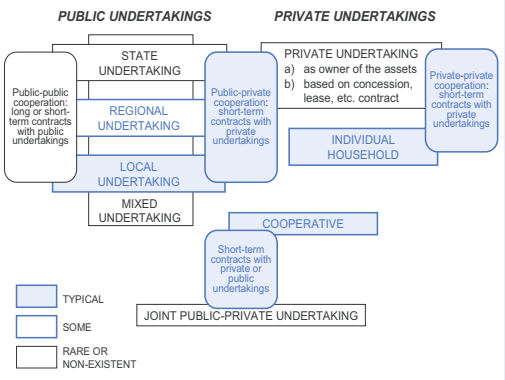
Discussion and conclusions

There are numerous alternatives for operating water and wastewater services. Traditions vary by countries, and practices vary within countries. Differences may be based on differences in ownership structure, but the same type of ownership does not guarantee that operating practices do not vary. The size of the water undertaking is an additional reason for differences. Figure 6 summarises various operational options. The shaded areas indicate the most common options in Finland.

In Finland, the water and wastewater infrastructure is owned by municipalities or, in the case of co-operatives, directly by the users. Municipal water undertakings utilise the services of private companies based on competitive bidding. Nowadays Finnish water co-operatives also frequently outsource their maintenance tasks either to private service companies, contractors or a local municipal water utility. Bringing market economics into public services does not necessarily entail giving up ownership of assets or management control. There is a very wide range of public/private combinations that can be evaluated to suit local conditions. Through such arrangements the private sector is able to get 60 to 80 percent of operating expenditure and nearly 100 percent of capital investment projects. Furthermore, competition is continuous – not every 12 to 30 years as occurs with management, lease or concession contracts.

Figure 6

OPERATION OF WATER SERVICES IN FINLAND



Modified from Pietilä (2006), p. 114.

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