

Role of Water Cooperatives in Water Service Production

- Lessons from Finland and Denmark

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Abstract

This paper examines water cooperatives in Finland and Denmark, and in particular it delves into the future of water cooperatives. During recent years, the trend has been that big is beautiful -- larger organisations can achieve economies of scale. Is there still a role for water cooperatives in the future?

Both in Finland and Denmark cooperatives have played, in particular in rural areas, an important role in the development of economic activities and improvement of living conditions. Water cooperatives are still very common. More than 40% of the Danish population is supplied water by a total of 2,500 water cooperatives; Finland has roughly the same number of water cooperatives.

In both countries municipalities are, in principle, responsible for the provision of water services for the inhabitants. In Denmark cooperatives have a strong status in legislation as water service providers outside large population centres. Finland is a sparsely populated country with large rural areas between built-up areas. Municipal water utilities cannot afford to extend their networks in rural areas. Development of improved water services has been left to the residents and cooperatives have proved to be a workable solution.

Keywords: water, cooperatives, Finland, Denmark

1. Introduction

Finland has a long tradition of water cooperatives, which presently number over 1,500, and supply water to 13% of the population, mainly in rural areas (Luukkonen 2013). Larger towns and cities are typically supplied by public water utilities. Water cooperatives in Finland are quite different from each other even though their basic task – to produce water and often also wastewater services – is similar. The Finnish water sector has a lot in common with that of our neighbour Sweden, except for water cooperatives. Sweden has hardly any water cooperatives, and the same applies to Norway, too.

On the other hand, in another Nordic country, Denmark, water cooperatives play an even bigger role than in Finland. More than 40% of the Danish population is supplied water by a total of 2,500 water cooperatives. Contrary to Finland, cooperatives in Denmark have no role in wastewater management which is by legislation the responsibility of the municipalities. At the beginning of the 20th century, virtually all the needs of rural communities were met by cooperatives (Birchall 2004). In farm product processing and distribution cooperatives still play a major role. Dairy cooperatives, for example, hold a market share of 97% (DGRV 2015). A newer development has been windmill cooperatives, which were established in particular during the 1980s and the 1990s so that at the turn of the century 80% of the windmills were owned by cooperatives. This trend has changed in more recent years as more utility-size wind projects have come online. (Cook & Lin 2015)

Elsewhere in Europe water cooperatives exist e.g. in Austria, Germany and Italy. In Austria, cooperatives cover 12% of water services being important for sparsely populated areas (Bauby 2012). Cooperatives have operated as regional energy utilities in many parts of Germany for well over 100 years. Over the last three decades more than 800 new cooperatives have been founded in the field of renewable energies in Germany (DGRV 2015). In the USA, cooperatives are the most common organizational form of water provision in suburban and rural communities and totally there are about 3,300 water cooperatives (ILO 2015).

Water cooperatives are private utilities. They are established, owned and managed by the people who are also the beneficiaries of their services. One basic principle of cooperatives is that members have equal voting rights, which means that an outsider cannot become an owner and thereby a decision-maker in the cooperative.

Cooperatives resemble private companies in that they need to cover their costs with the income they generate. But, according to cooperative principles, there is no need to generate profit to be distributed to the owners. Any profit is used to improve the system and the quality of services. Cooperatives operate on the 'full cost coverage' principle. Thus their tariffs reflect the real cost of the service provided. In many countries the activities of municipal water utilities, on the other hand, are subsidised by the state or local authorities.

This paper examines water cooperatives in Finland and Denmark, and in particular, the future of water cooperatives. In recent years, the trend has been “big is beautiful” – larger organisations can achieve economies of scale. Is there still a role for water cooperatives in the future?

2. Water cooperatives in Finland

Water cooperatives in Finland differ dramatically according to their physical environment, settlement pattern, acute needs of the population, and the legislation in force at the time of establishment. They can be classified into the following five groups (Takala et al. 2011, Pietilä 2015):

- 1) Water cooperatives established prior to 1950 in rural areas
- 2) Water cooperatives established in rural areas in the 1950s through the 1970s
- 3) Water cooperatives established in rural areas during the 1980s and 1990s
- 4) Water and wastewater cooperatives established since the 2000s.
- 5) Water cooperatives for rural townships established mainly in the 1950s

Only a few cooperatives of the first group provided sewerage services since wastewater was at the time discharged mainly into the septic tanks of individual properties. These cooperatives were established and operated solely by their members, as municipalities or the state did not have any support mechanisms in place (Juhola 1990). Wooden pipes were widely used and pipe laying and related work were mostly carried out by the members themselves. The initiators of the cooperatives were those whose demand for water was most urgent, such as dairy farmers. Since the 1950s the structure of the Finnish farming sector has changed dramatically: the number of dairy farms is now a fraction of what it used to be, but water cooperatives still exist.

The second group of water cooperatives was established when Finland was slowly recovering from World War II – since 1951 it was possible to apply for a subsidy or loan from the state to construct water or sewerage systems in rural areas. During the early years these subsidies were marginal and had hardly any impact on the economy of the cooperatives. As state authorities supervised all projects funded by state subsidies or loans, the resulting improved workmanship had a much bigger impact. Municipalities were not entitled to these support measures, only rural systems.

The third group of water cooperatives was established as some municipalities decided to extend their water supply and wastewater systems to rural areas in order to provide safe and reliable services to a larger share of their population. Several municipalities supported cooperatives by giving technical assistance in planning and construction, by subsidies, or by guaranteeing cooperatives' bank loans. For instance, the municipality of Pudasjärvi has 40 cooperatives, most established in the 1980s (Pietilä 2015). After Finland joined the EU in 1995, it has also been possible to get subsidies for cooperatives via some EU funding mechanisms.

The fourth group came into being after 2000 to supply water and increasingly also wastewater services in rural areas. People have become more aware and require higher quality drinking water. The water of their own private wells does not necessarily meet their requirements. On the other hand, people have also moved to rural areas thereby increasing population density there, which makes centralised water supply and sewerage a more viable solution. People moving from towns and cities are used to centralised services and are not interested in having and operating their own individual water supply or sewerage systems.

In 2004, legislation concerning wastewater disposal requirements for properties not connected to centralised sewerage (with their own disposal system) was tightened radically. As a consequence, most of the water cooperatives established since then also provide sewerage services. In addition, many previously water-only cooperatives have also built sewer systems. It is typical of cooperatives established in the 2000s not to have their own water intake or wastewater treatment facility. They buy water from a larger entity, typically a municipal water utility, and discharge wastewater to a municipality's sewer network. Only a few cooperatives have built their own water intake or wastewater treatment plant in the 2000s. The shift from owning a water intake to buying water from another utility started earlier as can be seen from Table 1.

Table 1. Water sources of private water utilities¹⁾ in South-West Finland (Ryynänen 2003)

<i>Established</i>	<i>Own water intake</i>	<i>Water bought from another utility</i>	<i>Total</i>
- 1949	11	0	11
1950 - 1959	19	0	19
1960 - 1969	20	2	22
1970 - 1979	25	29	54
1980 - 1989	16	11	27
1990 - 2002	7	64	71
<i>Total</i>	98	106	204

1) In addition to cooperatives, this table also includes small informal units and companies

The fifth group of cooperatives was established at a time when few rural towns had a centralised water and sewer system – residents relied on their own wells and septic tanks. Over the years, these cooperatives have expanded and presently cover not only the township but also the surrounding rural areas so that coverage can be up to 99% of the population of the entire municipality. Many of these cooperatives have from the beginning also provided sewerage and wastewater treatment, while some originally established for water supply only have later expanded their activities to cover wastewater services as well. (Vihanta 2013)

3. Water cooperatives in Denmark

In Denmark water cooperatives have had, and will have also in the future, an important role in the provision of water services to the citizens. Typically in cities and larger towns water is supplied by municipal water utilities, but in smaller towns and in rural areas water is supplied by private water undertakings, which are mainly cooperatives. As municipal water utilities are typically large, their number is only somewhat over 100 while there are about 2,500 water cooperatives. The size of these cooperatives varies from 10 to 20,000 households, while on average one cooperative serves 400-600 households. The number of cooperatives has during the recent decades gradually decreased via mergers, as in 1990 there were still more than 3,000 of them. Water supply is very decentralised in Denmark. In addition to cooperatives, there are some 50,000 households not connected to centralised supply that use their own private well. (GEUS 2015, Sørensen 2010)

In Denmark, the source of water is almost entirely groundwater and normally the quality of the water is good enough for drinking water requirements. In fact it is not allowed to treat drinking water using chemicals. Water is chlorinated only in exceptional circumstances. By area, Denmark is a rather small country (42,900 km²), with a relatively big population density of 130 inhabitants/km², compared with only 16 inhabitants/km² in Finland. Extensive farming in Denmark in the vicinity of wells and boreholes has resulted in groundwater contamination in particular in the form of excessive concentrations of nitrogen and pesticides. As a result, annually tens of water supplies have been closed during the last decades. This problem has been tackled in recent years by tighter regulation on the use of fertilizers and pesticides. (GEUS 2015)

Danish water cooperatives have established a joint organisation, Danske Vandværker (Association of Waterworks in Denmark), to assist and support its members. This association has a staff of about 15 experts who can help the cooperatives in various technical, financial, legal etc. questions. The organisation has also produced tailor-made guides and manuals, and it has arranged education and training events. Danske Vandværker has also negotiated an attractive insurance policy for its member cooperatives. (Danske Vandværker 2016)

4. Strengths and weaknesses of water cooperatives

Cooperatives fit very well into the EU's subsidiarity principle – decision-making at the lowest appropriate level. In Finland, at least in political discussion and decision making, the trend in the recent years has been the opposite – big is beautiful and more economical. That may be true in other sectors, but not necessarily in water services, which are by nature local activities. Merging of large networks in rural areas does not automatically provide the economic benefits of larger units. The relative effectiveness of large water utilities in cities derives more from high population density than the utilities' high productivity. Also in Denmark the trend has been towards larger units. A thorough municipal administration reform was carried out in 2000, when the number of municipalities was reduced from 271 to 98. Consolidation of water sector has also been discussed (Sørensen 2010).

Operation of small cooperatives is typically voluntary work. People are often willing to do voluntary work in their own neighbourhood or at the village level, but if a cooperative covers several villages, people no longer consider it their own and are less motivated to work without compensation. In Denmark the strengths brought up in connection with cooperatives include: a) dialogue and political contacts with many stakeholders through a widespread network, b) large public support, and c) direct contact to local authorities. Possible weakness may be a financially weak starting point but this can be overcome by cooperation with municipalities, utilities and investors. (Danmarks vindmølleforening 2009). In Finland, municipalities have often co-financed the investment costs of water cooperatives with up to 25% and also guaranteed cooperatives' bank loans (Pietilä 2015).

It is true that many water cooperatives are small, and they often lack sector technical or economic skills and knowledge. But, on the other hand, their systems are also often very simple thus requiring much less expertise compared to the utilities of towns and cities. In Finland, the

majority of small water cooperatives do not have their own water intake but buy water from a municipal water utility. Similarly, only a few cooperatives run their own wastewater treatment plant but discharge wastewaters into a municipal utility's network. Thus they only have to take care of their own wastewater networks. In Denmark, water supply is almost entirely based on the use of groundwater and water cooperatives draw water from their own wells or boreholes.

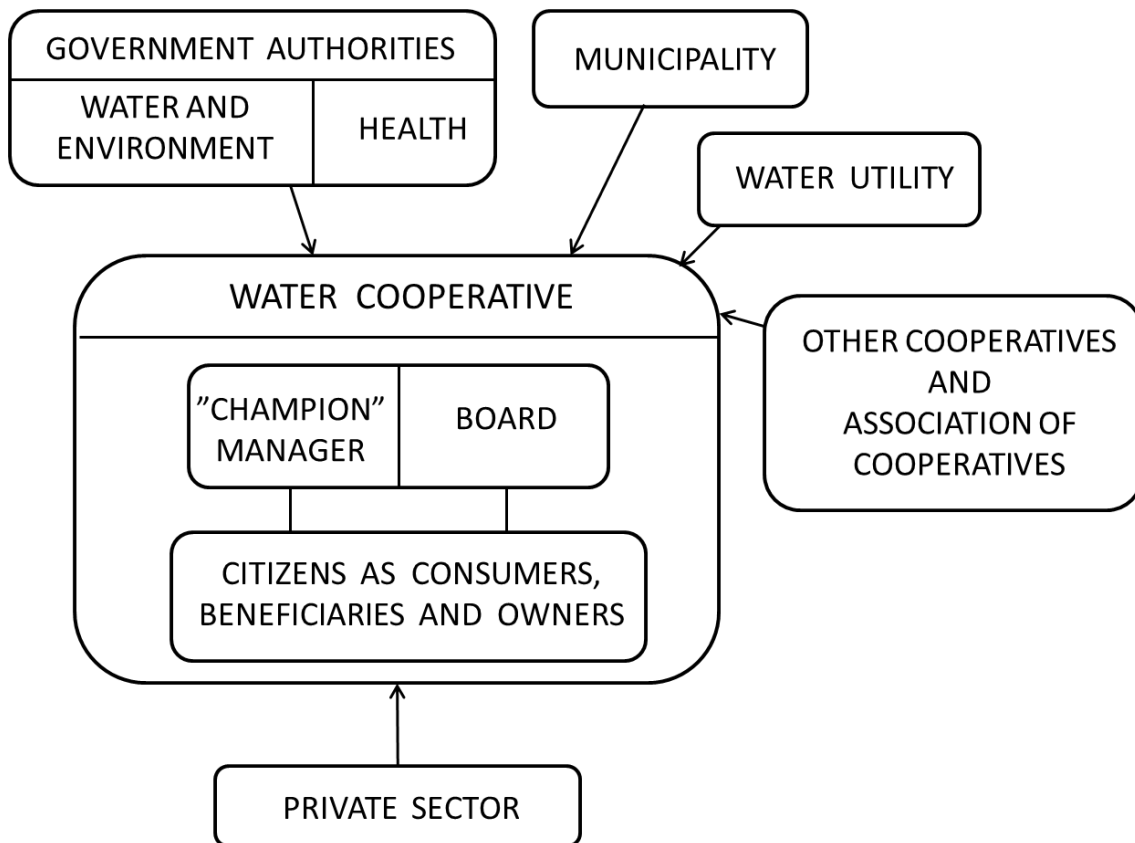


Figure 1. Water cooperatives and various stakeholders

At least in Finland, members of water cooperatives are often quite passive as long as everything goes well, and do not attend official meetings. But the meetings can be crowded and very intense, for example, if there is a need to increase tariffs substantially, or if someone tries to take over the water cooperative against the will of the people.

Many water cooperatives, in particular smaller ones, are facing difficulties. The active members are getting old, and it has proven difficult to get the younger generations involved in voluntary work. All those involved need to increase their knowledge and improve their skills. Undocumented tacit knowledge can also be a problem. Only the older employees of the cooperative who constructed the pipe network know its exact location. When these people retire, locating the networks will require much effort. Cooperatives could buy and utilise certain expert services, but as the members are used to cheap tariffs, higher charges are resisted. On the other hand, as there has not been much demand for expert services suitable for water cooperatives, only a few service providers exist at least in Finland. The situation is gradually improving as cooperatives are slowly becoming more trusting of external expert services, or

they just have to use them when none of the members of the cooperative is willing to be in charge of the activities.

Closer cooperation between water cooperatives may ease some of the problems small cooperatives are facing. In Denmark the cooperatives are well organised as they have established their own support organisation, Danske Vandværker. In Finland a similar organisation called SVOSK (Association of Finnish Water Cooperatives) was established in 2009, but so far the resources and activities of SVOSK have been rather modest in comparison with its Danish counterpart. SVOSK has organised annual national water cooperative workshops and training events with various partners. In the Kouvola Region, in South-East Finland, some 30 local water cooperatives established a joint association to support their activities. Similar regional associations are also planned elsewhere. (Pietilä 2015)

In Finland larger water cooperatives (the fifth group) are in a much better situation. They are large enough to employ enough staff to run their operations. In comparison to municipal utilities of the same size, these cooperatives have a clear operating principle – to produce good quality services to members with funds collected through charges. Municipal utilities are subject to political control which often makes long-term planning difficult. The goal of politicians is too often success in the upcoming elections, not necessarily the long-term good of the community.

The benefits and problems of water cooperatives are summarised in the SWOT-analysis below (Vihanta 2013, Pietilä 2015).

Table 2. SVOT analysis of water cooperatives

<u>Strengths</u>	<u>Possibilities</u>
- <i>flexible decision-making</i>	- <i>official status in municipality's water service structure</i>
- <i>decisions normally made without voting</i>	- <i>residents no longer need to take care of their individual systems</i>
- <i>no political motives in decision-making</i>	- <i>cooperation and quality of joint activities can be improved and less need for voluntary work</i>
- <i>creates solidarity</i>	
- <i>clear operating principle: expenses are covered by charges</i>	
- <i>municipal boundary does not restrict activities</i>	
<u>Weaknesses</u>	<u>Threats</u>
- <i>reliance on one person</i>	- <i>members get tired of voluntary work</i>
- <i>lack of skills</i>	- <i>not enough voluntary activists</i>
- <i>members get passive after system is operational</i>	- <i>in a small unit personal relations may get strained</i>
- <i>one or a few active persons may direct activities in an unwanted direction</i>	- <i>authorities' requirements become unnecessarily strict</i>

5. Role of water cooperatives in the future

Water cooperatives will remain important water and wastewater service producers in rural areas in Finland. Municipal water utilities will not be able to cover the rural areas to the extent that cooperatives have been able to. In Denmark cooperatives have a much stronger status as they are defined in the legislation as preferred water supply organisations in rural areas. The number of water cooperatives in both countries is expected to decrease as small cooperatives merge with each other or into a municipal utility.

The majority of water cooperatives are small and largely managed on a voluntary basis. It is useful to have support systems for these small cooperatives so that their operation and management practices reach a more permanent and professional level. In Denmark, this is already quite well organised via Danske Vandværker, but in Finland only the first steps have been made. Cooperation between cooperatives should also be encouraged.

There are a number of larger water cooperatives which operate as professionally as municipal utilities of the same size. Such cooperatives can be expected to remain independent water and wastewater service producers. In a number of municipalities in Finland a cooperative takes care only of water supply and distribution while the municipality is responsible for wastewater services. Some municipalities would like to transfer the responsibility for wastewater treatment to the local water cooperative.

In principle, Finnish water services are not affected by the financial situation of the municipalities since, according to the law, all costs related to water and wastewater service production should be covered by water charges. The charges should be sufficient to also cover maintenance and investment costs in the long term. In the case of municipal water utilities this principle does not always apply. In many municipalities the profit earned by the water utility is used to support other municipal sectors. That is not bad in itself – the money benefits the municipality's residents. Nevertheless, if the water utility is left with too little to spend on renovation and rehabilitation, the future of water services is threatened. With water cooperatives the equation is simple, as all costs are covered by charges, and any profits are used to improve the service.

6. Conclusions

According to the Finnish legislation, municipalities are responsible for water and wastewater services within their areas. Yet, a number of municipalities have no water or wastewater utility but a cooperative provides these services for their residents. In some such municipalities water distribution coverage is up to 99%, which is well over the national average of just over 90%. Several municipalities are currently discussing their sewerage management with the local water cooperative. They would like to transfer the responsibility for the sewerage system to the cooperative.

In Denmark cooperatives have a well-established role in water supply outside large population centres. Wastewater management is by legislation the responsibility of the municipalities. This

is different from Finland, where cooperatives often take care of wastewater as well.

The ultimate goal of water and wastewater cooperatives is straightforward: to produce good quality service to their members and cover related costs by the income they generate. As cooperatives are not under municipal administration, they are not subject to political decision-making. On the other hand, as they do not have to earn a profit for their shareholders, no external price regulation is necessary. Cooperatives are well in line with the commonly agreed principle of subsidiarity which suggests that decisions should be made as close to the affected people as possible.

Ageing infrastructure is a common problem in European countries. The renewal rate of the water and wastewater infrastructure of many Finnish utilities is unacceptably low. At the current rate of renewal, the pipelines would have to serve for 200 years, which is simply impossible. In Denmark, too, pipeline renewal rate of municipal water utilities is not sufficient. On the other hand, many water cooperatives have been able to maintain their networks and renew ageing pipelines in due course. Yet, the water tariffs of these water cooperatives can be lower than those of municipal utilities of the same size. Our findings suggest that the cooperative is a more efficient management organisation than a municipal utility, but further research is needed to confirm that.

The public sector in many European countries will face serious financial challenges in the future. People will live longer than before, which is going to increase pension, health care and other social security expenses. At the same time, the share of the working age population will decrease. Consequently, at least in Finland and Denmark, the current welfare state can no longer be sustained on public funding alone. New ways of providing public services must be found. Cooperatives are a successful example in the water sector.

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