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PRINWASS PROJECT: An examination of the politics of privatization of water and sanitation services in Africa, Europe and Latin America. Cases from Finland and Greece.

Vol. 4, N° 1

(In English)

Newcastle upon Tyne and Buenos Aires, March 2017

Cover picture: Tammerkoski River, Summertime at the industrial city of Tampere, Finland, 11 June 2005
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Research Projects Series
PRINWASS Project

"An examination of the politics of privatization of water and sanitation services in Africa, Europe, and Latin America (1990-2004) – Cases from Finland and Greece"

José Esteban Castro (Editor)
Newcastle upon Tyne and Buenos Aires
March 2017

WATERLAT-GOBACIT Research Network
5th Floor Claremont Bridge Building, NE1 7RU Newcastle upon Tyne, United Kingdom
E-mail: waterlat@ncl.ac.uk – Web page: www.waterlat.org

WATERLAT-GOBACIT NETWORK Working Papers

General Editor

Jose Esteban Castro

Emeritus Professor,
Newcastle University
Newcastle upon Tyne, United Kingdom
E-mail: esteban.castro@ncl.ac.uk

Editorial Commission: (click here)

Research Projects Series

PRINWASS Project

An examination of the politics of privatization of water and sanitation services in Africa, Europe, and Latin America (1990-2004) – Cases from Finland and Greece

Jose Esteban Castro (Editor)

Keywords: Water and sanitation, public policies, political ecology of urban water, public services, privatization, neoliberal politics, Finland, Greece.

Corresponding Editor:

Jose Esteban Castro

Emeritus Professor,
Newcastle University
Newcastle upon Tyne,
United Kingdom
E-mail: esteban.castro@ncl.ac.uk

Corresponding authors:

For comments or queries about the individual articles, contact the relevant authors. Their email addresses are provided in each of the articles.

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Presentation of the Working Paper

We are glad to present another issue of the PRINWASS Project Series (SPIPRW). The SPIPRW Series has the objective of making available edited materials based on the final reports of the PRINWASS Project (www.prinwass.org). This project was carried out between 2001 and 2004 and was funded by the European Union's Fifth Framework Programme. PRINWASS is a major landmark for our Network, as WATERLAT-GOBACIT was created by a group of PRINWASS partners after the project ended to continue working together on the politics of water and water services.

Although some time has passed since the project ended, the topics addressed and the project's findings have significant relevance and can contribute towards better understanding some of the challenges currently facing the implementation of progressive, egalitarian water politics. In short, PRINWASS' main objective was to examine critically the policies of privatization of water and sanitation services implemented worldwide during the 1990s, looking at specific cases from Africa, Europe and Latin America. The project carried out case studies in Argentina, Bolivia, Brazil, England and Wales, Finland, Greece, Kenya, Mexico, and Tanzania, and developed comparative analyses of the main findings. Although the original reports were freely available by request, and we produced several specific publications based on the project's findings, much of the material remains largely unknown and, for this reason, we launched the SPIPRW Series to facilitate the dissemination of research results.

This Working Paper features two articles presenting edited materials based on the original reports from the case studies carried out in Finland and Greece. These two cases provide examples from constrating experiences, which have important lessons for current debates on the privatization of essential public services. The Finnish cases examined in Article 1 illustrate a tradition of water services management strongly based on municipal control of essential public services. Although there has been historically a strong interaction between the public and private sectors, the provision of essential water and sanitation services is under municipal control, and the standards of provision are very high in terms of quality and coverage. Still, being part of the European Union, Finland has also been under pressure to allow stronger private-sector participation in the provision of essential public services, and the article highlights different scenarios facing the provision of water and sanitation services in the country resulting from these pressures. Article 2 presents a very detailed analysis of the privatization policies implemented in Athens in the late 1990s. The provision of water and sanitation services in Greece constrasts sharply with the Finnish situation, as the introduction of privatization policies in the country resembles more clearly the general pattern of neoliberal policies implemented worldwide during the 1990s. The original reports were written in 2003 and 2004, and therefore the articles sometimes contain references that may be outdated.

We hope that the readers will find this material useful and that it may contribute to the work of researchers, students, activists, and others in their activities to understand better the internal workings and the huge impacts of water privatization processes. These policies are not only very much alive, but are also experiencing a worldwide revival. Therefore, we believe that the findings and lessons that emerged from the PRINWASS

Project deserve this publication effort. We wish you all a pleasant and fruitful reading.

Jose Esteban Castro

General Editor and Working Paper Editor

Newcastle upon Tyne and Buenos Aires, March 2017

ARTICLE 1

The experience of Finland

Osmo Seppälä - Finnish Water Utilities Association (FIWA), Finland.

Tapio Katko[1] - Tampere University of Technology, Finland.

Pekka Pietilä - Tampere University of Technology, Finland.

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Abstract

The article presents a synthesis of research results from the study of Finnish water and sanitation services. It addresses the role of the public and private sectors in the provision and management of these services, placing emphasis on the importance of municipal authorities and consumer-managed cooperatives in rural areas. The paper discusses the wide range of options that can be found in the cooperation between public and private entities, which is a long-term historical characteristic of the country's water and sanitation services sector. In the Finnish case, "private sector" in water and sanitation services refers mainly to a range of actors outside the public sector, most of which are small and medium scale providers of support services and manufacturers, and privately-run small cooperatives in rural areas. The article presents evidence of the levels of efficiency and quality of water and sanitation services, and offers a discussion of scenarios for the analysis of the main challenges facing these services, and suggesting likely trends and future developments.

Keywords: Public-private cooperation; water and sanitation services; water and sanitation cooperatives; municipal services; Finland

1 Corresponding author: Tapio Katko. E-mail: tapio.katko@tut.fi

Resumen

El artículo presenta una síntesis de resultados de investigación del estudio de servicios de agua y saneamiento en Finlandia. El trabajo aborda el papel de los sectores público y privado en la provisión y gestión de estos servicios, colocando el énfasis en la importancia que tienen las autoridades municipales y las cooperativas gestionadas por los propios consumidores en las áreas rurales. El trabajo discute el amplio rango de opciones que se registra en las formas de cooperación entre entidades públicas y privadas, lo que es una característica histórica de largo plazo en el sector de los servicios de agua y saneamiento del país. En el caso finlandés, "sector privado" en los servicios de agua y saneamiento se refiere principalmente a un rango de actores afuera del sector público, la mayoría de los cuales son proveedores de servicios de apoyo y de manufacturas de escala pequeña y mediana, además de pequeñas cooperativas gestionadas por actores privados en las áreas rurales. El artículo presenta evidencia de los niveles de eficiencia y calidad de los servicios de agua y saneamiento, y ofrece una discusión de escenarios para el análisis de los principales desafíos que enfrentan estos servicios, así como también sugerencias sobre las tendencias y desarrollos futuros más probables del sector.

Palabras clave: Cooperación público-privada; servicios de agua y saneamiento; cooperativas de servicios de agua; servicios municipales; Finlandia

Acknowledgements

The authors wish to acknowledge the Managing Directors and staff of the case-study water utilities for their assistance in obtaining the information. Mr Harri Mäki is acknowledged for his valuable inputs in assessing the data from the archives and for assistance in making the analysis on financial and economic performance of the utilities and institutional development stages.

Introduction

The Finnish case study looks into the key principles and practices of public-private cooperation in water services based largely on local government (municipality) owned utilities which cooperate with the private sector. Such systems have a long tradition in larger Finnish cities and townships though many of them are fairly small compared with other European countries. In any case, this is the most common management model of water services in the EU member countries. It is important to note that the public involvement includes not only the state level, but also the regional and municipal (local) level. In the Finnish case, private sector involvement is understood in a broad manner, including also outsourcing non-core and support services and goods, incorporation of utilities, commercialisation of utilities, (small) private water associations and co-operatives, etc.

This option of municipality-owned utilities has several alternatives like the traditional municipal utility, an autonomous utility, a company owned by the municipality or an inter-municipal utility. In sparsely populated areas, joint water service systems are managed by private water cooperatives whose founding and operation are nevertheless in most cases supported by municipalities. Consumer-managed water and sanitation cooperatives in dispersed rural areas and small villages are largely private of their nature. Supra- and inter-municipal cooperation of water utilities is an increasing trend in Finland.

From Finland three (3) specific utility level case studies were selected, which elaborate the above mentioned issues in a practical manner. These case studies aim at contributing to the following overall objectives of the PRINWASS project. The three selected Finnish case studies are:

1) **LV Lahti Water Ltd** is a joint-stock full service water company owned by the city of Lahti in the southern part of Finland.

2) **Kangasala Municipality Water and Sewerage Works** is a municipal water and sewerage utility, which has been reformed as an autonomous municipal enterprise since 2002. It is responsible for drinking water supply and distribution, wastewater sewerage, and storm water drainage. The utility serves about 19,000 people within the area of Kangasala municipality.

3) **Lappavesi Ltd** is a bulk water supply (joint-stock) company owned by the municipalities of Lapua, Nurmo, Kuortane and Kauhava in the region of Southern Ostrobotnia in Western Finland (Map No 1). The population within the service area of Lappavesi Ltd is about 35,000. Lappavesi Ltd was established in 1972.

Lapua Sewerage Ltd is a joint-stock sewerage company owned by the municipalities of Lapua and Nurmo, and the Atria Oyj food processing company. Lapua Sewerage Ltd was established in 1973.

The case studies are based on collection and analysis of background material collected from the utilities; mainly annual reports and economic data (financial statements etc.).

Personal interviews were carried out with the Managing Directors of utilities and the Financial Manager of LV Lahti Water Ltd.

LV Lahti Water Ltd

LV Lahti Water Ltd was selected as a case study as an example of a medium-sized town water utility, which is one of the first incorporated municipal water utilities in Finland. It was incorporated in 1994, and until then it was a semi-autonomous department of the city's technical department.

The main objective of selecting LV Lahti Water Ltd as a case study in PRINWASS project is to assess how incorporation of a municipal utility to a joint-stock company affects the performance and efficiency of the utility. Although the company is fully owned by the city, it operates strictly according to commercial operational principles. The case study will examine whether an incorporated municipal company can operate as efficiently as a private enterprise. Cooperation between the company and private enterprises in various types of supporting services is also studied.

Kangasala Municipality Water and Sewerage Works

Development of water supply in Kangasala started in the 1950s. Since the 1970s, Kangasala has had active cooperation with the neighbouring municipalities in water supply. The development stages of the water utility have had various interesting features. The role of small private water works was important in the development of the municipal water utility.

Lappavesi Ltd and Lapua Sewerage Ltd

Lappavesi Ltd is a bulk water supply (joint-stock) company owned by the municipalities of Lapua, Nurmo, Kuortane and Kauhava in the region of Southern Ostrobotnia in Western Finland (Map No 1). The population within the service area of Lappavesi Ltd is about 35,000. Lappavesi Ltd was established in 1972. Lapua Sewerage Ltd is a joint-stock sewerage company owned by the municipalities of Lapua and Nurmo, and the Atria Oyj food processing company. Lapua Sewerage Ltd was established in 1973.

Lappavesi Ltd and Lapua Sewerage Ltd were selected as case study utilities for the following reasons:

- Lappavesi Ltd as an example of wide supra-municipal cooperation in bulk water supply. The bulk supply company has clients among the municipalities (4) and several water cooperatives.
- Lapua Sewerage Ltd as an example of sewerage and wastewater treatment cooperation between municipalities and an industrial company.

The location of the three Finnish case study utilities is shown in Map No 1.

Map No 1.: Map showing the location of the Finnish case-study utilities

Environmental conditions and water resources

General

The United Nations World Water Development Report: Water for People, Water for Life (UNESCO, 2003) considers the water in Finland cleanest in the world. The report ranked 122 countries based on the quality of their water and their ability and willingness to improve it. Finland also scored the highest number of points on the overall Water Poverty Index which graded 147 countries according to their water use.

Finland has large resources of high quality raw water. About 60 per cent of drinking water is derived from groundwater, of which some 10 per cent is artificially recharged groundwater, and it usually requires little or no treatment. The rest of the drinking water

is obtained from surface waters, i.e. from rivers and lakes. Water quality is classified as good or excellent in about 80 per cent of the country's lakes and in 40 per cent of the rivers. Surface waters must be treated due to their high concentration of natural organic carbon which can, for example, lead to bad taste and odour.

Agricultural activities are presently the highest single source of nutrients to surface waters. The primary problem caused by these discharges is eutrophication of surface waters. Groundwater pollution caused by nitrate leaching from fields is a local problem. Nitrogen levels have been increasing, but the main reason may be the exceptionally warm and rainy winters in the late 1980s and early 1990s. The pulp and paper industry is clearly the most prevalent water polluting industrial sector in Finland (FEI, 2003).

LV Lahti Water Ltd.

Lahti city gets its raw water mainly from the aquifer area of the Salpausselkä ridge in east-west direction and from the crush structure of Vesijärvi-Laune in north-south direction. The aquifer area is about 20 km^2. It yields about 20,000-25,000 m^3/d of ground water. The entire yield of groundwater aquifers within Lahti city area is about 30.000 m^3/d.

There is another significant aquifer area in Hollola municipality area, called Hälvälä-Sairakkala aquifer area, which is about 45 km^2 wide. Its yield is about 45,000 m^3/d.

The ridge formation of Salpausselkä acts as a natural filter and purifies the groundwater to such a level that it could be used as drinking water even without treatment. Groundwater is basically well protected from the effects of air pollution, radioactive fallout, bacteria, and from other potential contaminants. Salpausselkä groundwater has high oxygen content and does not contain excess iron, salinity, or other substances harmful to colour or taste. On the other hand, the aquifer areas are mainly located within the constructed city area, and need careful monitoring and protection to avoid gradual contamination through human activity.

The oldest groundwater intake in Lahti (Laune) had to be closed in 2001, because initially a small concentration of pesticides was detected and later the concentration exceeded the permissible level. The pesticide was called atratzine, which was commonly used until 1993 against weeds and pests.

LV Lahti Water Ltd made in 1994-1995 a groundwater protection plan for its groundwater intakes. This plan included a survey on the hydrogeological conditions and potential risks to groundwater. The most potential risks to groundwater quality were identified as (LV Lahti Water Ltd, 2003):

- Fuel stations and oil tanks
- Road and railway traffic
- Industrial chemicals

- De-icing chemicals (salts) used for roads
- Leaking sewers and infiltration of wastewater into ground
- Use of pesticides and fertlisers in gardens and parks
- Abstraction (excavation) of soil materials
- Excess soil landfills
- Car washing in unpaved areas.

The protection plan identified and proposed several alternative means and activities to reduce groundwater contamination risks. Many of these proposals have already been implemented, and the contamination risks have reduced for the most common risk activities. However, the groundwater contamination risk due to various solvents and pesticides persists also in Lahti. The closing of Laune groundwater intake in 2001 was a clear indication of this.

Kangasala

Kangasala municipality gets its raw water from groundwater aquifers that are located along the ridge formations in north-west – south-east direction. The biggest water intake is Riku, which is located along Lake Vesijärvi about 4 km from the centre of the municipality. The raw water of Riku intake is mainly groundwater infiltrated from the lake. It is abstracted through four groundwater wells. The raw water is disinfected and pH is adjusted using soda.

Lapua

Water resources for the use of Lappavesi Ltd are abstracted from the Lappakangas groundwater aquifer area in Kuortane municipality. The main reason for looking for regional cooperation in water supply was the unavailability of good quality raw water within the consumption area of most of the concerned municipalities (especially Lapua, Nurmo and Kauhava). Lappakangas area was the only significant good quality groundwater aquifer area in the neighbourhood.

Surface water resources (mainly rivers) in the area are not anymore in a condition that would favour their utilisation as a raw water source for drinking water purposes. The current surface water quality is also not suitable for artificial recharge of groundwater due to high concentration of organic matter.

Characteristics and trends of the water and sanitation services

Characteristics of water and sanitation services

Summary of the main characteristics and trends of water supply and wastewater services in the case study utilities are presented in Tables No 1 and 2.

Table No 1: Water supply services data.

Parameter	LV Lahti Water Ltd	Kangasala
Connections	11,550	3,656 households 19,730 cap
Water supplied:		
- billed (m^3/d)	21,400	2,830
- UFW (%)	10.00	21.00
Service coverage (%)	97.90	87.40

Table No 2: Wastewater services data.

Parameter	LV Lahti Water Ltd	Kangasala
Connections	11,480	3,296 households 18,810 cap
Wastewater amount:		
- billed (m^3/d)	22,190	2,706
- led to Tampere (m^3/d)	-	4,239
- leakages (%)	25.00	56.60
Service coverage (%)	97.30	83.40

Recent trends in water and sanitation services are described in Tables 3.3 to 3.5, which show selected key performance indicators of LV Lahti Water Ltd from 1996 to 2001.

Table No 3: Selected performance indicators of LV Lahti Water Ltd in water supply from 1996 to 2001

INDICATOR (Water supply)	Unit	1996	1997	1998	1999	2000	2001
Water abstraction	Mm^3/a	9.40	9,20	9.00	8.60	8.20	8.10
Water sales	Mm^3/a	7.80	7.80	7.80	7.70	7.60	7.60
Max. consumption	m^3/d	32,300	31,800	30,934	30,059	30,967	26,625
Min. consumption	m^3/d	17,900	16,700	15,034	16,371	11,639	12,889
Unaccounted-for water	%	16.40	14.60	13.10	10.90	8.10	6,.80
Energy consumption	kWh/m^3	0.401	0.406	0.406	0.411	0.408	0.413
Water distribution network	km	443	443	444	446	447	458
Network maintenance costs	EUR/m	1.04	1.08	1.16	1.14	1.06	1.38
Network length per customer	m/ customer	40.40	40.00	39.60	39.20	38.80	39.10
Customers (connections)	Number	10,964	11,098	11,240	11,378	11,528	11,703
Service coverage	%	97.70	97.70	97.70	97.70	97.80	97.90

Table No 4: Selected performance indicators of LV Lahti Water Ltd in wastewater services from 1996 to 2001.

INDICATOR (Water supply)	Unit	1996	1997	1998	1999	2000	2001
Service coverage	%	97	97	97.10	97.20	97.20	97.30
Billed wastewater	Mm^3/a	8.20	8.20	8.40	8.20	8.20	8.10
Treated wastewater - total - Kariniemi - Ali-Juhakkala	Mm^3/a	12.30 8.10 4.20	11.60 7.80 3.80	12.80 8.60 4.20	11.30 7.60 3.70	12.40 8.30 4.10	10.70 7.20 3.50
Infiltration into sewers	%	33	30	34	27	35	25
Sewerage network	km	410	410	410	411	413	418
Storm water sewerage network	km	267	272	278	284	295	300
Network maintenance costs	EUR/m	0.72	0.79	0.79	0.77	0.78	0.75
Average age of rehabilitated sewers	years	35	37	37	38	40	37
Sewage pumping stations	Number	51	52	52	52	53	54
Pumping energy	kWh/m^3	0.081	0.081	0.088	0.09	0.092	0.093

Table No 5: Selected performance indicators of LV Lahti Water Ltd in wastewater treatment and load to receiving water bodies from 1996 to 2001.

INDICATOR	Unit	1996	1997	1998	1999	2000	2001
BOD_7:							
- Kariniemi	tn/a	67	82	55	42	52	34
- Ali-Juhakkala	tn/a	26	22	28	31	39	21
Ammonium nitrogen:							
- Kariniemi	tn/a	14.60	28.20	31.80	19.10	8.40	8.40
- Ali-Juhakkala	tn/a	5.70	2.40	9.30	6.80	7.70	1.80
Total nitrogen:							
- Kariniemi	tn/a	184	129	138	98	103	79
- Ali-Juhakkala	tn/a	143	130	119	123	137	135
Phosphorus:							
- Kariniemi	tn/a	2.30	3.60	2.10	2.30	2.70	1.70
- Ali-Juhakkala	tn/a	1.40	1.60	2.00	2.60	2.00	0.90
Bio-efficiency (BOD_7 + amm.N)	kg/ kWh	1.20	1.27	1.15	1.55	1.67	1.64
Phosphorus/ ferro-efficiency	P kg/ Fe tn	72.50	71.5	63.3	71.5	65.2	62.30
Energy consumption	kWh/ m^3	0.65	0.75	0.70	0.71	0.65	0.72
Treatment costs	EUR/ m^3	0.16	0.17	0.16	0.21	0.19	0.24

Figures No 1 and No 2 show the schematic operational structure of Lappavesi Ltd and Lapua Sewerage Ltd.

Figure No 1: Bulk water supply system of Lappavesi Ltd.

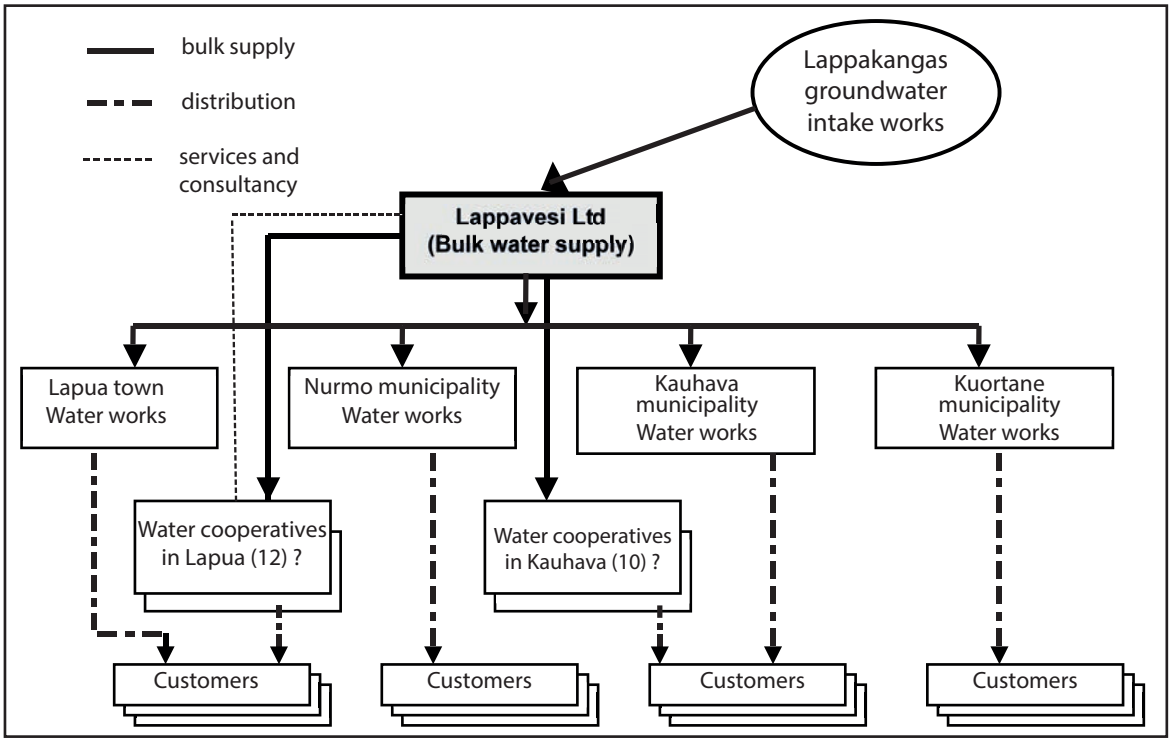
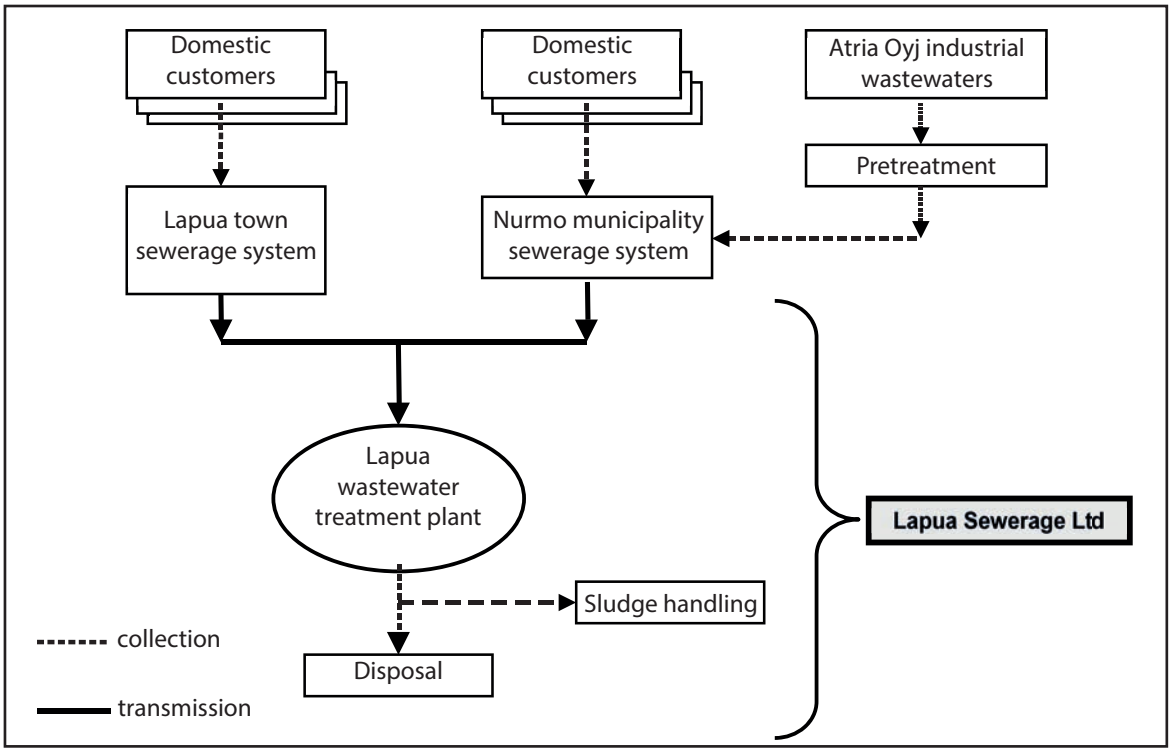


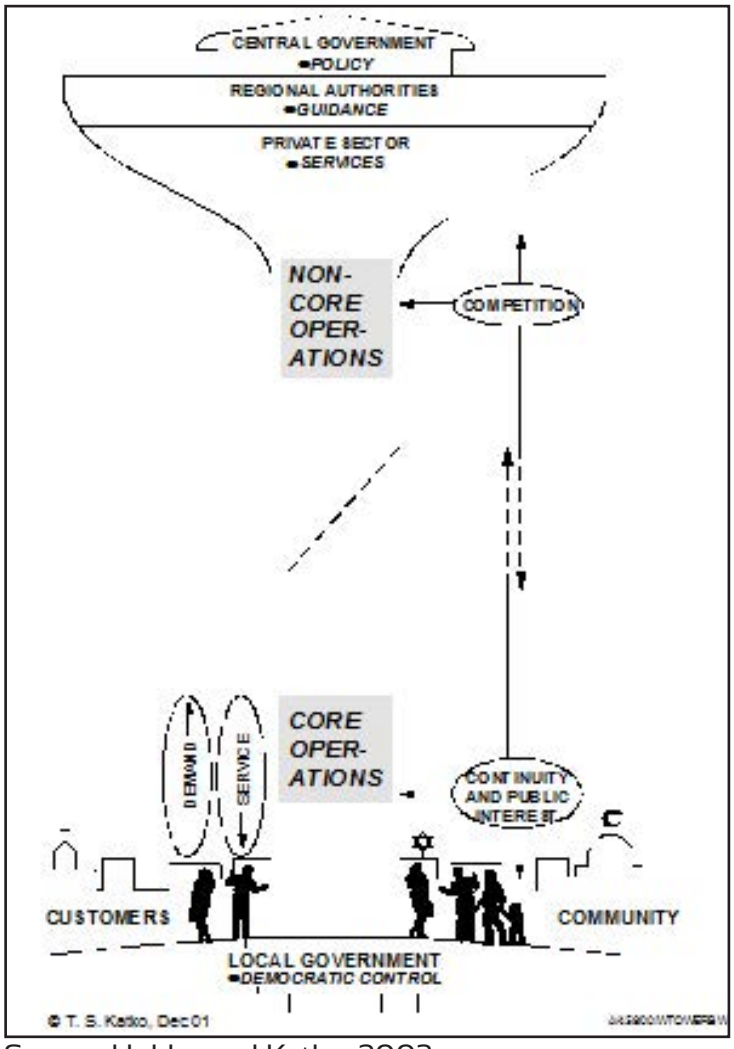
Figure No 2; Sewerage system of Lapua Sewerage Ltd.



Private sector involvement in water and sanitation services

Finland has a long and extensive experience in public-private cooperation in the water supply and sewerage sector, although perhaps not in the sense that public-private partnership is often understood (i.e. private finance initiative). Outsourcing of services – especially non-core services – of public water utilities in Finland is very extensive. Outsourced services can form as much as 60-80 per cent of the utility's turnover (cash flow) in many utilities. According to Metsälä (2001) the average cash flow of water utilities to private sector services varies between 21-65 per cent, the average being 40 per cent. In the actual operation and maintenance of utility operations, private sector services have mainly been used in pumping stations and sludge treatment. Figure No 3 illustrates the typical Finnish type of public-private cooperation, where water utilities are in municipal ownership but autonomous enterprises that outsource majority of their non-core services and goods from private companies.

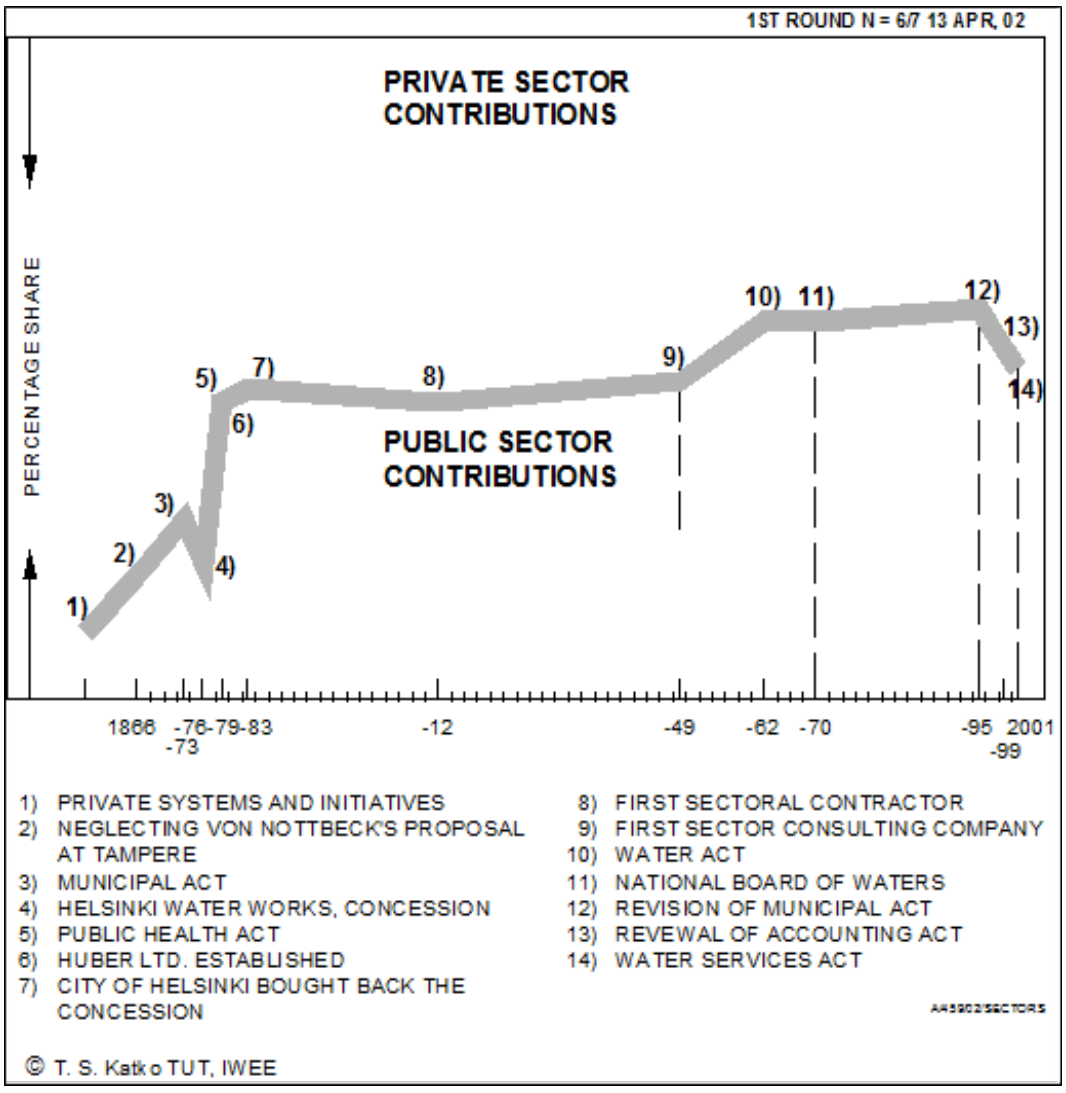
Figure No 3: The Finnish model of public-private cooperation in water services



Source: Hukka and Katko, 2003.

The relative shares of the public and private sector in the development of water and sewerage services in Finland have changed over time, as illustrated roughly in Figure No 4. The figure includes the authors' view of the main affecting events and factors in the relative shares.

Figure No 4: Relative shares of public and private participation in the development of water and sewerage services in Finland and the main factors affecting the changes.



Source: Modified from Hukka and Katko, 2003

Private sector participation in the case study utilities

LV Lahti Water Ltd is a joint-stock company fully owned by the City of Lahti (all 20 shares are owned by the city). Yet, the utility operates mainly according to the commercial principles in a similar way as any private enterprises. The economic performance of LV Lahti Water Ltd has been very good since the incorporation.

In Kangasala the role of small private water works was important in the development of the municipal water utility.

A strong feature of Lappavesi Ltd is its supra-municipal cooperation (cooperation between several municipalities). The main driver for the supra-municipal cooperation was the unavailability of good quality raw water within the area of most partner municipalities, except Kuortane. The experiences for already 30 years from the bulk water supply company have been positive.

Lappavesi Ltd has different types of cooperation with the smaller water cooperatives in the area. Some water cooperatives buy water in bulk from Lappavesi Ltd, but some have their own groundwater intakes. Water cooperative probably remain independent as long as they still have willing and capable managers and champions. The municipalities seem rather unwilling to merge water cooperatives into their municipal water and sewerage works. Lappavesi Ltd sells some services to water cooperatives, but in a fairly limited scale. These include services related to water treatment processes, leakage detection, and alike. In fact, Lappavesi Ltd gives these services in most cases free as a sign of good public relations.

All three case study utilities are outsourcing services and activities substantially from the private sector (Charts No 1 to 7). The share of the private sector of the total expenditure varies between 45 and 80 percent on an average, but for Lapua Sewerage Ltd it has been as high as about 90 per cent on an average. The main activities and services that are outsourced from the private sector include:

- Construction and rehabilitation of infrastructure
- Materials supply (pipes and equipment)
- Instrumentation and automation works
- Maintenance and service.
- Laboratory services
- Sludge handling (1/3 of the annual turnover)
- Instrumentation and automation works
- Maintenance and service.

Demo-geographic and socio-economic characteristics

Selected indicators of the demo-geographic and socio-economic characteristics of the municipalities and service area of the case study utilities are shown in Tables No 6 to 8.

Table No 6: Population in the municipalities of the Finnish case study utilities.

Municipality	Population (1.1.2003)	Total area (km^2)	Population density (cap/km^2)
Lahti	97,968		
Kangasala	23,010		
Lapua	13,998	751	18.60
Nurmo	11,323	362	31.30
Kuortane	4,366	462	9.50
Kauhava	8,161	485	16.80

The population of Kangasala has during the recent years grown strongly. The net population growth has been:

- Year 2000: 357 people
- Year 2002: 434 people (+ 1,9 %)

Kangasala aims strategically at about 100 people's net growth annually. The fact that the growth has been much bigger has caused increasing pressure also for water and sewerage services in form of investments into new water infrastructure. Population growth is mainly directed to existing housing areas in order to reduce network construction pressure for new areas. (Äikäs, Juuti and Katko, 2003).

Table No 7: Age and gender distribution of the population.

Municipality	Total population (1.1.2003)	0-14 years (%)	15-64 years (%)	65- years (%)	Male (%)	Female (%)
Lahti	97,968	15.90	68.20	15.90	47.00	53.00
Kangasala	23,010	20.40	66.80	12.80	49.30	50.70
Lapua	13,998	18.30	63.00	18.70	49.60	50.40
Nurmo	11,323	23.90	66.80	9.30	50.00	50.00
Kuortane	4,366	15.90	61.40	22.80	50.50	49.50
Kauhava	8,161	18.20	63.40	18.40	49.20	50.80

Table No 8: Employment and income development pattern.

Municipality	Agriculture and primary production (%)	Secondary production (%)	Services (%)	Unknown (%)
Lahti	0.3	31.6	66.5	1.6
Kangasala	2.8	31.1	64.8	1.3
Lapua	10.9	35.1	51.1	2.9
Nurmo	4.3	29.5	64.3	1.9
Kuortane	17.7	28.6	50.5	3.2
Kauhava	11.4	30.3	55.1	3.2

The biggest industrial employer in Lahti city is Isku-Yhtymä Oy – the furniture manufacturing company, which has about 1.160 employees. Lahti city has about 6.050 employees. In Lapua area the biggest employer in the area is Atria Oyj – the food processing company in Nurmo municipality, which has about 1750 employees. Nurmo municipality has about 500 employees.

Techno-institutional development and innovation

Characteristics of the system's infrastructure

LV Lahti Water Ltd

Water intake and treatment:

LV Lahti Water Ltd has seven (7) own groundwater intakes, which are located within the area of Lahti City and Hollola municipality. LV Lahti Water Ltd has an abstraction permit for 32,500 m^3/d, and in addition it is allowed to purchase 3,000 m^3/d groundwater from Hollola area from the federation of municipalities (between Lahti and Hollola). This federation was established in 1972 for raw water abstraction.

The groundwater is treated against pipe corrosion by dosing lime and sodium hydroxide. Small dosage of chlorine (0.1 g/m^3) is added to prevent microbial growth in the network.

The current total capacity of the groundwater pumping stations is about 31.000 m^3/d, as follows:

- Jalkaranta: 17,000 m^3/d
- Urheilukeskus: 4,500 m^3/d
- Laune: 4,500 m^3/d (closed in 2001)
- Renkomäki: 2,500 m^3/d
- Riihelä: 2,000 m^3/d
- Kunnas: 1,000 m^3/d
- Kärpänen: 1,000 m^3/d
- Kuntayhtymä: 3,000 m^3/d (water purchased from Hollola)

Water supply network:

LV Lahti Water Ltd has a water distribution network with total length of 450 km. About 50 per cent of the network consists of plastic pipes. There are altogether five (5) elevated water reservoirs (Löyttymäki, Mustankallio, Pirttiharju and Nikkilä).

The specific domestic water consumption is about 160 l/cap,d. The coverage is 98 per cent, which means that there are almost 95,000 people connected to the water supply network.

Sewerage and storm water drainage network:

LV Lahti Water Ltd has a sewerage network with totals length of 410 km and a storm water drainage network of 290 km. The sewerage network is divided into two main drainage areas (northern and southern). The city centre still has a combined system of wastewater and storm water sewerage. The system has over 50 sewage pumping stations.

Wastewater treatment:

LV Lahti Water Ltd has two wastewater treatment plants:

- Kariniemi wastewater treatment plant for the northern drainage area
- Ali-Juhakkala wastewater treatment plant for the southern drainage area.

The two treatment plants treat altogether over 36,000 m^3/d of wastewater in a biological-chemical process. Kariniemi treatment plant applies total nitrogen removal for part of the year. Both plants apply ammonium nitrogen removal. Phosphorus removal is achieved by using ferrous sulphate and ammonium nitrogen removal is assisted by using lime.

Treated wastewaters from Kariniemi are led in a rock tunnel (length 4,5 km) to River Porvoonjoki near the Ali-Juhakkala treatment plant. The rock tunnel is flushed every two weeks using lake water from Lake Vesijärvi. There is a balancing and settling basin for the flushing water in Ali-Juhakkala (area 1.5 ha and volume 62,000 m^3). The settled sludge is treated at Ali-Juhakkala treatment plant.

Sewage sludge is treated at both treatment plants using digestion, drying and composting. Composted sludge is utilised for gardening and agriculture.

Kangasala

Water intake and treatment:

Kangasala water and sewerage utility has three (3) own groundwater intakes. Groundwater is disinfected and also the pH is adjusted using soda. There are also two connections to the water distribution network of Tampere Water, through which Kangasala can draw 300-600 m^3/d in exceptional situations.

Water supply network:

Kangasala water and sewerage utility has a water distribution network with total length of 185 km. There is a stripe shaped network from Huutijärvi villaga to Vatiala, and from Vatiala to Asema, Ruutana and Haviala villages. Raikku village has about 2 km of separate water distribution network. About 70 per cent of the network nowadays consists of plastic pipes (Äikäs, Juuti and Katko, 2003, p. 88).

There are three (3) elevated water reservoirs in the system (Kirkkoharju, Harjunsalo and Lentola) with a total storage capacity of 2.111 m^3. There are also six pressure booster stations in the system (3 for domestic customers and 3 for industrial customers).

The specific domestic water consumption is about 143 l/cap,d. The coverage is about 87 per cent, which means that there are about 19,700 people connected to the water supply network.

Sewerage and storm water drainage network:

Kangasala water and sewerage utility has a sewerage network with total length of 166 km and a separate storm water drainage network of 21 km. The system has 46 sewage pumping stations and four storm water pumping stations.

Wastewater treatment:

Kangasala does not anymore have its own wastewater treatment facilities, because all wastewaters from the centralised sewerage system of Kangasala municipality have been transmitted to Tampere since 1980. The annual amount of wastewater transmitted to Tampere is about 1,5 million m^3/a. The wastewater amount billed from customers is about 1,0 million m^3/a.

Lappavesi Ltd and Lapua Sewerage Ltd

Water intake and treatment:

Lappavesi Ltd has altogether 33 groundwater intakes (wells) in a series of four aquifer areas. The intakes are located as follows:

- Menkijärvi and Lakajoki: 2 wells (1991)
- Kuopiontie and Akanristi: 3 wells (1993)
- Hirvikangas: 2 wells (1996)
- Hirvikangas / Perikytö: 2 wells (1997)
- Lahdenkangas / Kuortane: 2 wells (1999)
- Porrasoja: 4 wells (1999).

The ground water quality is reasonably good, but Lappavesi Ltd applies some treatment to the raw water. Iron and humus removal is done in Porrasoja treatment plant. The flotation sludge is dried using centrifuges. Disinfection is done using ultraviolet radiation. The current water use is about 15,500 m^3/d. Industry uses about 4,500 m^3/d and domestic customers about 11,000 m^3/d.

Water supply network:

Lappavesi Ltd owns and operates the main transmission lines. Distribution networks and water reservoirs belong to the municipal water works in Lapua, Nurmo, Kauhava and Kuortane municipalities.

Sewerage network:

Lapua Sewerage Ltd owns and operates the main transmission sewer lines (about 18 km) and main pumping stations (5). Since 2002 the pumping stations have been operated and monitored using a remote controlled SCADA-system. Sewerage collection networks within the municipalities belong to the municipal water and sewerage works.

Wastewater treatment:

Lapua Sewerage Ltd operates the wastewater treatment plant which is located in Lapua town, constructed in 1993. The current population equivalent of the municipal wastewaters is about 9,000 (Lapua 7,000 and Nurmo 2,000). Industrial wastewater load is about 60 per cent of the total load. In addition to the main wastewater treatment plant, the system comprises a balancing tank (for industrial wastewaters) and alkaline dosing.

Stormwater drainage:

Stormwater drainage is the responsibility of the municipalities.

Capacity and innovations

Human resources and organisation

LV Lahti Water Ltd has about 100 employees. The number of employees has gradually decreased since the incorporation in 1994 (Table No 9). Distribution of staff to various departments and activities is shown in Figure No 4.

Table No 9: LV Lahti Water Ltd personnel 1996-2001.

Personnel	Unit	1996	1997	1998	1999	2000	2001
Permanent staff	Employees	107	105	102	100	98	96

Kangasala water and sewerage utility has nowadays 15 permanent employees (5 on monthly salary and 10 on hourly salary), and one temporary employer. In addition, there are 10 persons employed by the municipality who carry out tasks for the water utility, but are not paid by the utility.

Lappavesi Ltd has altogether six (6) employees (½ + ½ + 4) and Lapua Sewerage Ltd altogether four (4) employees (½ + 3). This means that some of the staff, such as the Managing Director, are shared between the two companies. (Figures No 5 and 6).

The water and sewerage works of the owner municipalities have the following sector personnel:

- Lapua: seven (7) employees (for water, sewerage, waste management, streets)
- Nurmo: five (5) employees
- Kauhava: 3-4 employees
- Kuortane: two (2) employees.

Figure No 5: Organisation and staffing of LV Lahti Water Ltd.

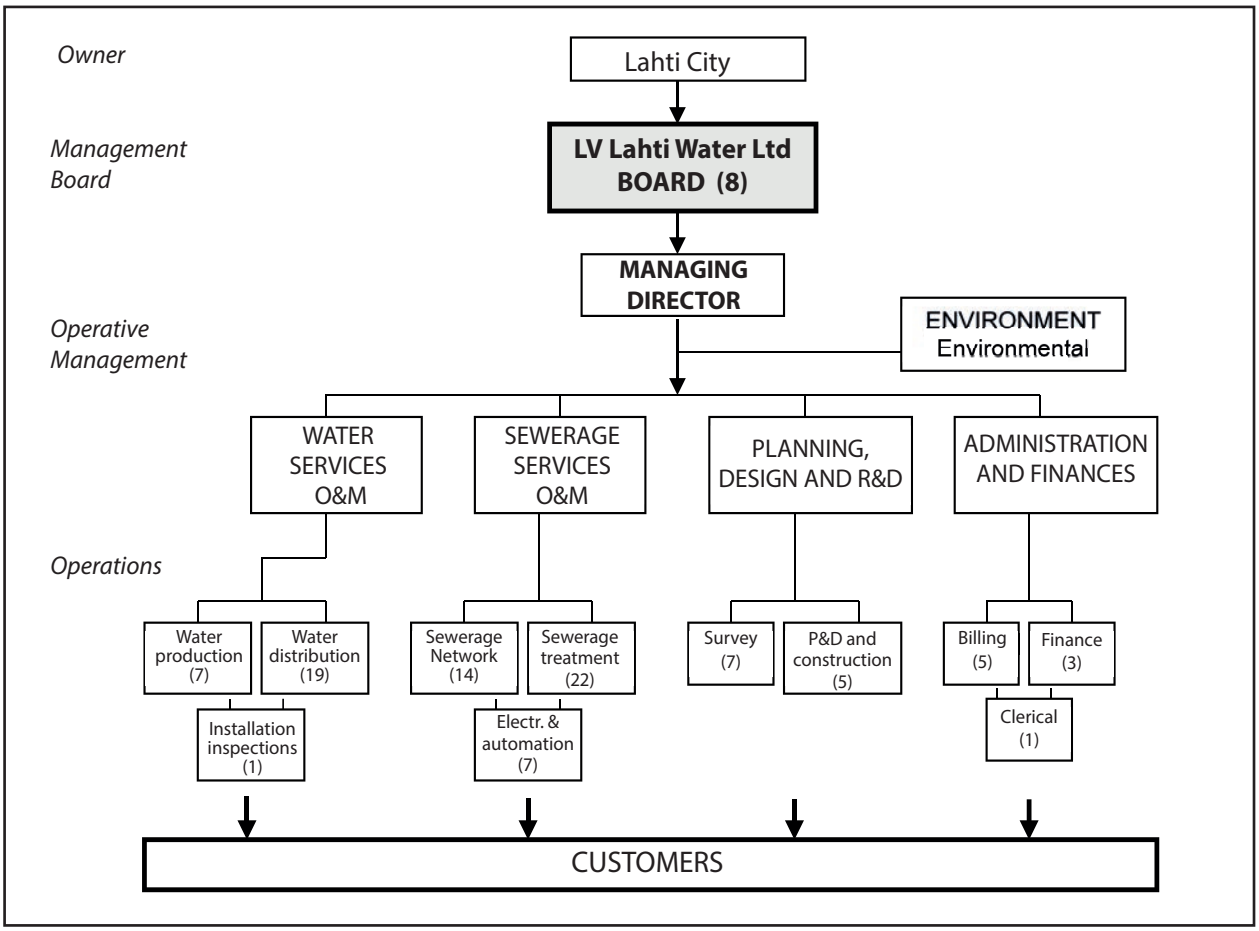


Figure No 6: Management system and staffing of Lappavesi Ltd.

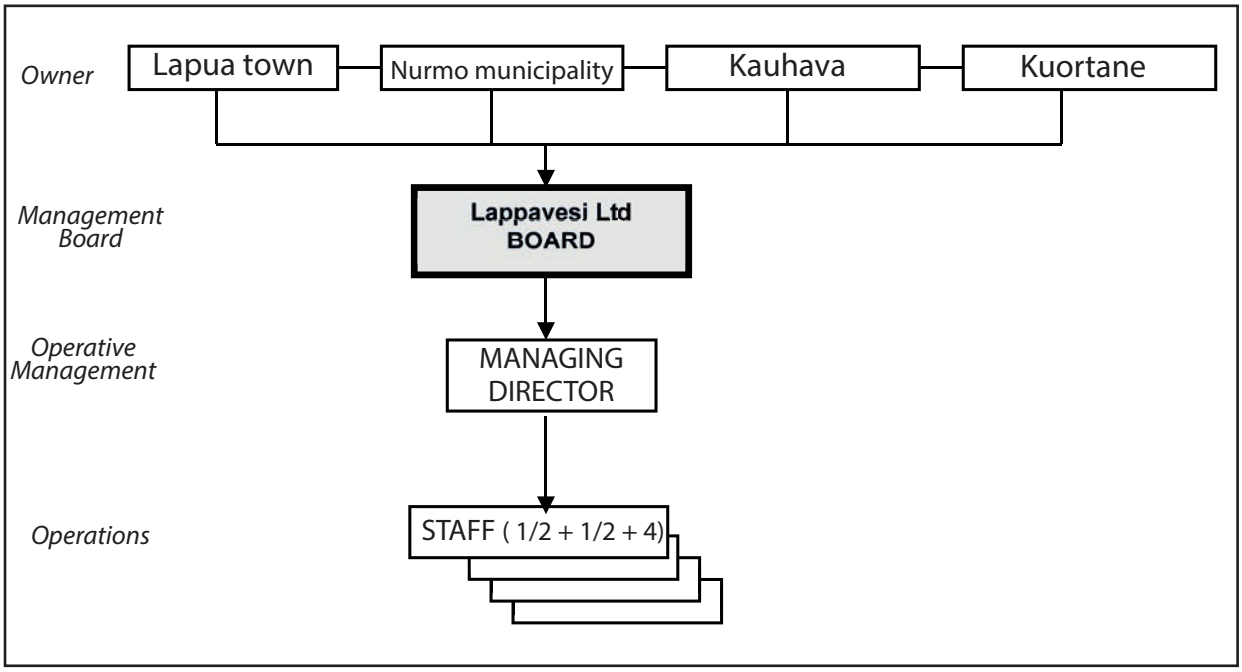
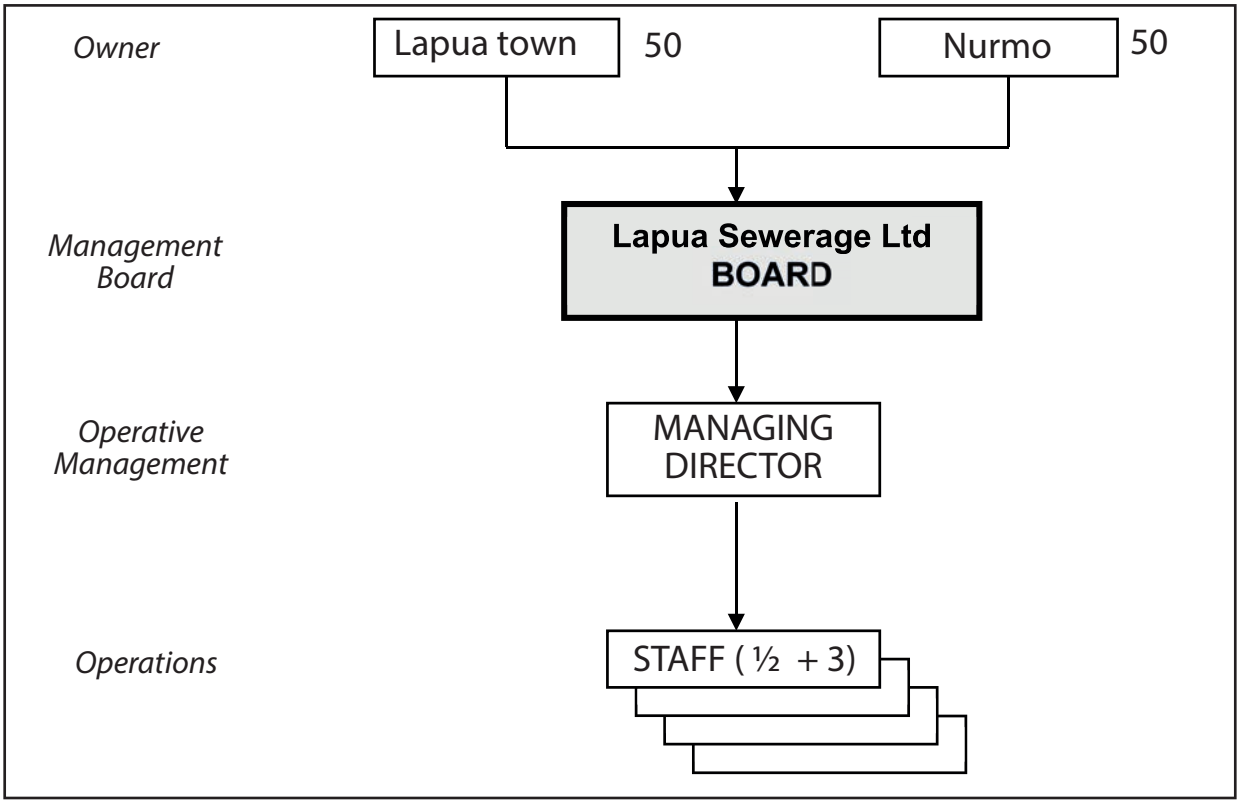


Figure No 7: Management system and staffing of Lapua Sewerage Ltd.



Plans for future regional cooperation

LV Lahti Water Ltd has cooperation in water abstraction with Hollola municipality. There have been negotiations and plans on more active cooperation between the two utilities, but currently they are not progressing substantially.

There are plans for increased supra-municipal cooperation in water supply within the Tampere-Valkeakoski region (so called TAVASE-cooperation). Kangasala is also involved in this cooperation. According to these plans, all municipalities (13) in the area move gradually entirely to use groundwater.

According to TAVASE plans, a raw water intake and an artificial groundwater infiltration plant will be constructed in Vehoniemi area in Kangasala (Map No 2).

Map No 2: Schematic plan for TAVASE water intake areas and treatment plants.

Source: TAVASE, 2001.

Technological innovations

Lappavesi Ltd has taken some innovative technologies in use among the very first Finnish water utilities. Some examples include:

- Vortex type flotation process as the third water utility in Finland
- Centrifugal drying of iron concentrated water treatment sludge as the first water utility in Finland
- Ultraviolet radiation disinfection (in use only in about 10 water utilities in Finland).

Policy-institutional environment

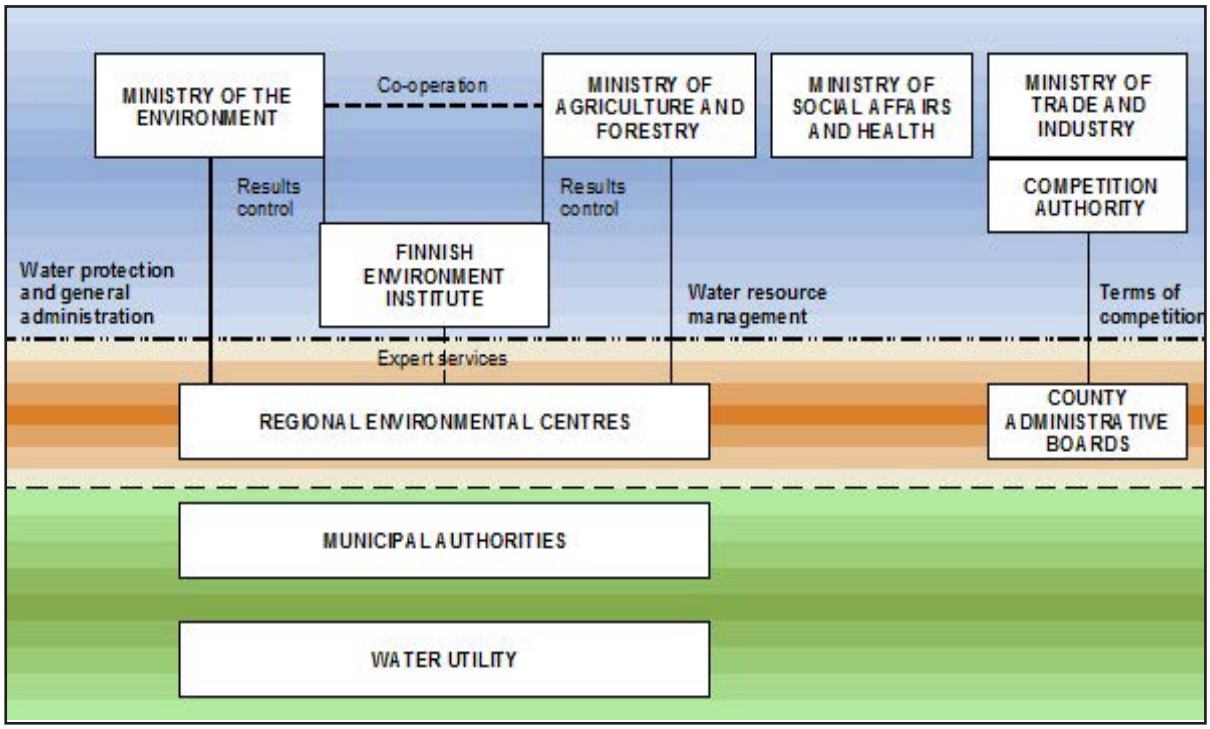
Institutional framework of water and sewerage services in Finland

The institutional framework of water and sewerage services in Finland is described in Figure No 7. Water resource management at the central (state) level is the responsibility of the Ministry of Agriculture and Forestry (MAF) and the Ministry of the Environment (MOE). These ministries are in charge of water and environmental policy and strategy development and legislation. Under these ministries the Finnish Environment Institute (FEI) operates as a national advisory body. Other national level key authorities are the Ministry of Social Affairs and Health (MOSAH) and the Ministry of Trade and Industry (MTI). MOSAH gives the guidelines for drinking water quality, and MTI through its Finnish Competition Authority currently supervises the economic activities and competition in the water and sewerage services sector.

At the regional level water utilities are supervised by the regional environment centres that also are responsible for regional planning, monitoring and guidance in water issues within their area. The Environmental Permit Authorities are giving the permits in accordance with the Water Act. They issue the permits for the utilities having the substantial environmental impacts.

Municipalities are responsible for the provision, i.e. the enhancement and development of water and sewerage services in their jurisdiction. The municipal council makes decisions concerning the general bases for charges for municipal and other services. The water and sewerage utilities, which are mainly owned by the municipalities, produce water and sewerage services in their service territory. Utilities are monitored and controlled by the municipal health protection and environment protection authorities.

Figure No 8: The role of central-, regional- and local level water administration in Finland.



Source: Modified from Vehmaskoski, Pietilä & Seppälä, 2002.

EU directives are put into effect by Finnish legislation. In 2001, an EU water policy framework directive came into force which established goals, minimum requirements and an action plan for water pollution control and sustainable use of water resources. The Water Act (1961) is currently amended. It deals with the water resources management in general.

The Environment Protection Act (2000) is a general law which governs activities which pollute soil, waters and air.

The Water Services Act (2001) sets a general obligation for the development of water and sewerage services by municipalities aimed at supplying a sufficient amount of domestic water of a good hygienic standard at a reasonable cost as well as proper sanitation from the viewpoint of environmental protection.

The Health Protection Act (1994) includes provisions on the quality of domestic water and its monitoring as well as several provisions on water works.

The Land Use and Building Act (2000) emphasizes the significance of environmental issues. The Act makes it easier to consider the conditions for organizing water and sewerage services.

Municipalities are obligated to chart the need for protection of waters and the

environment. They issue environmental protection orders for the building and maintenance of waste water systems.

Water Services Act

The legal and institutional environment for water and sewerage utility operations in Finland is defined in the new Water Services Act (119/2001) (Ministry of Agriculture and Forestry, 2001).

The Water Services Act (119/2001), which conforms to the EU Water Framework Directive (2000/60/EC), contains provisions for the organisation of the water supply as well as for waterworks and charges. The Water Services Act repeals the earlier Act on Public Water and Sewerage Systems (1978) and the Act on Wastewater Rates (1974). Necessary minor revisions were made in the Health Protection Act (1993), Water Act (1961), Land Use and Building Act (1999), and in the Act on Assistance for the Community Water Supply Measures (1980).

Water Services Act harmonises the regulation of the water supply and sewerage and the related contract procedures and payment systems between the waterworks and their customers. According to the Water Services Act all contracts and charges related to water supply will be governed by the private law. According to the earlier act, the relationship between the utility and the customer was ambiguous, partly governed by the public law and partly a contractual relationship based on private law. The delimitation and procedures were also not fully clear, which could not be considered satisfactory in terms of the legal protection of neither the customer using the water nor the waterworks.

Water Services Act also contains provisions on consumer protection related to water services similar to those laid down in the Consumer Protection Act, in order to guarantee a minimum level of consumer protection in water issues. The purpose is to secure a minimum level of water services so that everyone will have access to healthy, high-quality household water at reasonable cost and that sewerage and purification of wastewater is appropriately organised in terms of health and the environment.

Water Services Act provides a more accurate definition of the relationship between the utility and customers in order to secure the availability and quality of services in changing conditions, such as the incorporation of municipal waterworks, and to clarify the responsibilities of municipalities, waterworks and real estates. Efforts are also made to improve the availability and level of water services in the population centres and sparsely populated areas outside the current territories of the waterworks.

The new Water Services Act regulates all water supply services for population and connected productive or leisure activities, whereas the former act was concerning only (public) water utility operations. The new act clarifies the roles and responsibilities of various stakeholders so that the municipality, water utility, households and regulatory authorities have better defined responsibility areas.

Municipalities have the responsibility to develop all water service within their area

according to the principles of the new act, and the water utility is responsible for utility services in their operational area. Household owners are responsible for their water supply by connecting to the utility's network and by taking care of their water supply equipment. Regulatory authorities are responsible for controlling that households connect to the network. The new act aims at harmonising the regulations in drinking water supply and wastewater disposal, and improving transparency of water utility economy and charges, and customer protection.

Three main types of water and sewerage services

Finnish WSS utilities can be classified into three main categories based on the organisational and functional model:

1. Small private water associations serving country communities and sparsely populated areas within municipalities.
2. Municipal utilities serving population centres and municipalities.
3. Supra-municipal utilities.

In 2001 the total number of the two first categories including those serving more than 50 people was some 1970. The small systems, water associations can be partnerships, water cooperatives, or joint-stock companies owned mainly by municipalities. There were about 1 000 associations in 1988 and the number has increased in dispersed rural areas. The number of municipal water utilities in 1998 was about 500 and some 460 in 2001, slightly over the total number of municipalities. The small water associations, mainly cooperatives, usually provide water supply services, whereas sewerage services are provided by municipal utilities.

The water and sewerage utilities of bigger municipalities have been merged, although many of them still call themselves 'water utility'.

Institutional development stages of the case study utilities

In the following the development stages of the three case study utilities are described more in detail, to give an idea of the impact of (i) overall policy and legal framework and (ii) local level decisions and issues (Tables No 10 a-e).

Table No 10a: Development stages of legislation and administrative changes in Finland and the case study utilities.

Year	Legislation	Lahti	Kangasala	Lapua
1951	The first Financing Act			
1953			Kangasala Water and Sewerage Cooperative	
1955			Central Village Waterworks Company joins Kangasala Water and Sewerage Cooperative.	
1957				Lapua Water and Sewerage Ltd
1959			Municipal water and sewerage utility established. Water supply committee changed to the Management Board of the water utility.	
1961	Water Act	The committee for technical and real estate affairs changed to a technical committee.	Public works committee established. Management Board of the water utility abolished.	
1968	Regional planning covers the entire country		The position of a Municipal Engineer established.	

Table No 10b: Development stages of legislation and administrative changes in Finland and the case study utilities.

Year	Legislation	Lahti	Kangasala	Lapua
1969		Water and sewerage operations centralised by establishing a water and sewerage works under the technical department. The WS works has its own director (previously under the Town Engineer; sewerage and wastewater treatment was under the construction department).		
1970	Water adminis-tration (National Water Board established)			
1971		Electricity committee established. Electricity works under the electricity committee.	Sewerage works are separated as an autonomous part of the water utility	
1972				Lappavesi Ltd established
1973	Act on the Water Protection Measures for Communities	.		Lapua Sewerage Ltd established
1974	Act on the Waste-water Rates.			

Table No 10c: Development stages of legislation and administrative changes in Finland and the case study utilities.

Year	Legislation	Lahti	Kangasala	Lapua
1976			Ilkko and the central village water cooperatives join the municipal water utility	
1977	Act on the public water utilities			
1978	Cabinet decision of the water supply works. Customer Protection Act.			
1980	Act on Assistance for the Community Water Supply Measures.			
1981			Technical committee established.	
1989		Water supply works became an autonomous municipal enterprise as Water and sewerage works. Transferred together with the electricity works under the new municipal enterprise committee and technical deputy mayor.		

Table No 10d: Development stages of legislation and administrative changes in Finland and the case study utilities.

Year	Legislation	Lahti	Kangasala	Lapua
1990	MAF decision on the terms of loans for water supply and water protection measures.	Lahti Energy Ltd is established and the committee for the public utilities is abolished. Water and sewerage utility back under the technical committee.		
1991	EU Urban Wastewater Treatment Directive.			
1992	Competition Restriction Act. Public Procurement Act. EU Directives on Public Procurement: 92/50/EEC			
1993	Health Protection Act. EU Directives on Public Procurement: 93/36/ EEC and 93/38/EEC			
1994		LV Lahti Water Ltd: Managing Director, Management Board, Supervisory Board.		
1995	Finland joins EU. Local Government Act amended. Decree on Assistance for the Community Water Supply measures.		O&M of storm water sewers is transferred from the road board to the water utility	

Table No 10e: Development stages of legislation and administrative changes in Finland and the case study utilities.

Year	Legislation	Lahti	Kangasala	Lapua
1998	EU Urban Wastewater Treatment Directive. EU Drinking Water Directive.			
1999	Land Use and Building Act.			
2000	Environmental Protection Act. EU Water Framework Directive.			
2001	Water Services Act. Land Use and Building Act. Water Act amended. Health Protection Act amended.	Supervisory Board is abolished.		
2002			Water utility becomes an autonomous municipal enterprise.	

Economic and financial aspects

Financing and economy of the Finnish water services sector

The government financing in water services sector increased in real terms until the 1980s, but was never more than 10 percent of total investments. In the 1970s and 1980s, the government provided finance for groundwater investigation and, especially, larger WSS and water protection projects to foster the establishment of supra-municipal cooperation. The government's share has been rather small, and it has been used solely for the advancement of common projects. The water and sewerage utilities together with the municipalities have assumed main responsibility for the projects.

Initially, municipalities financed projects through taxation, but, especially in the 1980s and 1990s, the finance has come increasingly through water and wastewater charges. The new Water and Sewerage Services Act interestingly stipulates that WSS charges can include no more than a reasonable rate of return for investments.

Most water utilities of the largest cities in Finland are economically very profitable,

and they have applied commercial bookkeeping already since the late 1980s. Most large urban water utilities adopted a water-pricing system during the last decade that made the earlier used 'hidden taxation' more visible. Although these municipal utilities originally aimed at reasonable cost recovery, many of them earned excessive profits for the owner organisations. Tariffs were not always based on full cost recovery but on the need to subsidise other public sector activities or to finance activities of the municipal central administration. Some of these utilities have annually gained profit to their owner municipalities as high as 8-15 per cent as a rate of return on capital and 30-40 per cent of the annual turnover. Water charges were used to repay again for the infrastructure investments that already have been paid for, and eventually reimburse the returns to the municipality. Customers in Finnish water utilities pay on average EUR 17-35 per capita per annum as return on capital to the municipal owner of utility. Some of these large utilities will in the future face high pressure of reducing their charges.

According to the Water Services Act, all municipal water utilities should have adopted the commercial bookkeeping principles by the end of 2001. Thus, they would all become autonomous municipal enterprises. In practice the transition period seems to become longer. Water utilities should clearly separate their economy from the general municipal economy. Utilities should use capitalised costs based on the original purchase values as the book value of their fixed assets, as stated in the bookkeeping act and decree. Utilities should annually make their own financial statement and balance sheet.

Water and wastewater charges and pricing

Water charges in Finland are in general reasonable, and form only a small portion of the overall living costs. The relationship between the price and the quality of service is so strong that it cannot be significantly changed. Better possibilities to lower charges are with utilities that have set their tariffs rather according to the average national tariffs than according to their own real costs. It is easier to reduce water charges in the short-term by neglecting maintenance and by increasing risks. One alternative is to compensate volumetric consumption charges with basic charges. Large utilities seem to charge higher tariffs than necessary for cost recovery purposes, because they have been able to bring substantial profits to their owner municipalities. On the other hand, the smallest municipal utilities overate heavily at loss, and need municipal subsidies through tax revenue.

In principle, most municipal water utilities in Finland aim at the Full Financial Cost Recovery (FFCR). According to the new Water Services Act, charges should on the long run cover all water supply investments and operation and maintenance costs. Charges may include only a reasonable rate of return on capital investment. Water supply investments can be subsidised by the municipality, the state, and the European Union.

According to the new Water Services Act (119/2001) the municipality decides also on the service charges of the water and sewerage utility. In practice, this does not anymore mean that in all cases the municipal councils would decide on the water and sewage charges as it used to be earlier. All municipal water utilities should (gradually) become autonomous municipal enterprises. Thus, their Board would decide on the charges. In

joint-stock companies – whether municipality or privately owned – the Board decides on the charges. In all types of private operators, including water cooperatives, the Board decides on the charges. The charges of all water utilities are now based on private law. Thus, there are no judicial differences in the charges between municipal utilities, joint stock companies and cooperatives.

The guidelines and recommendations for water utility charges were renewed recently. The guidelines aim at harmonising the principles of charging and tariff structures, but certainly not the tariff levels. These guidelines include a proposal on how the regulations of the Water Services Act are applied in practice. These guidelines are an internal tool for the utility and municipality and they are not distributed to the customers. Instead, the revised tariff and service charge schedules are distributed to the customers when new service agreements are being made or agreements are being amended. Water utilities that are organised in form of joint-stock companies or cooperatives have flexibility to define their tariff structures, but in practice they follow the same principles as the municipal water utilities.

The new Water Services Act enables the utilities better to renew their tariff structures to comply with their actual cost structure. According to the Act the tariffs and charges now always consist of:

1. (Volumetric) user charges, which can cover all types of operational costs
2. (Fixed) basic charges (if relevant separately on water and sewerage), which can only cover fixed operational costs
3. Connection charges, which can cover investment costs
4. Other charges, such as various service charges.

Water utility must charge a user charge, which is based on the amount of water used and on the amount and quality of wastewater discharged. In addition, the utility can charge a connection fee, a basic charge, and other charges for its services. Other charges except the (volumetric) user charge can be different in different areas within the utility's operational area.

These service charges include e.g. water meter inspection fee, meter reading fee (in case that the customer has not submitted the meter reading to the utility in time), construction charges for service lines and opening charges of blocked sewers. Other service charges include fees for the use of fire fighting equipment, closing and opening charges for valves at the request of the customer, and other services that customers may order from the utility.

The new Water Services Act also enabled the utilities to collect fixed charges on sewerage. Earlier sewerage charges were mainly volumetric, and were based directly on the quantity of water used. According to the recommendations, fixed charges should not usually exceed one third of the total amount of fixed and user charges. Utilities can also justify fixed charges, if they do not intend to apply connection charges.

The revision of the pricing structure in Finland was justified also to correct the previous discrepancy in the cost recovery practice. In most water utilities the bulk of the revenue (over 90 per cent) used to come from variable income (revenue based on volumetric charges according to water use) and only a small portion (less than 10 per cent) from other (fixed) revenue. On the other hand, the actual cost structure in water utilities is practically just the opposite. Majority of the costs (80-90 per cent) are fixed and fairly independent on the volume of operations, such as capital costs, maintenance and depreciation of fixed assets, and personnel costs and administration. The recent amendments aim at increasing the share of revenue from fixed charges to 25-35 per cent of all water revenue income.

Finland applies the common EU principles of "polluter pays" also in water services. Wastewater charges are typically environmental taxes, and in Finland they are applied fully according to the polluter-pays-principle. Sewerage charges are collected by water utilities as customer charges, including volumetric user charges, basic charges, and connection charges.

Charges in the case-study utilities

Table No 11: Water and wastewater tariffs in LV Lahti Water Ltd from 1996 to 2001.

TARIFF	Unit	1996	1997	1998	1999	2000	2001
Water charge	EUR/m^3	0.76	0.76	0.76	0.76	0.76	0.76
Wastewater charge	EUR/m^3	1.03	1.03	1.19	1.19	1.19	1.19

Table No 12: Water and wastewater tariffs in Kangasala water and sewerage utility from 1996 to 2002.

TARIFF	Unit	1996	1997	1998	1999	2000	2001	2002
Water charge	EUR/m^3							1.05 (0,86)
Wastewater charge	EUR/m^3							1.55 (1,27)

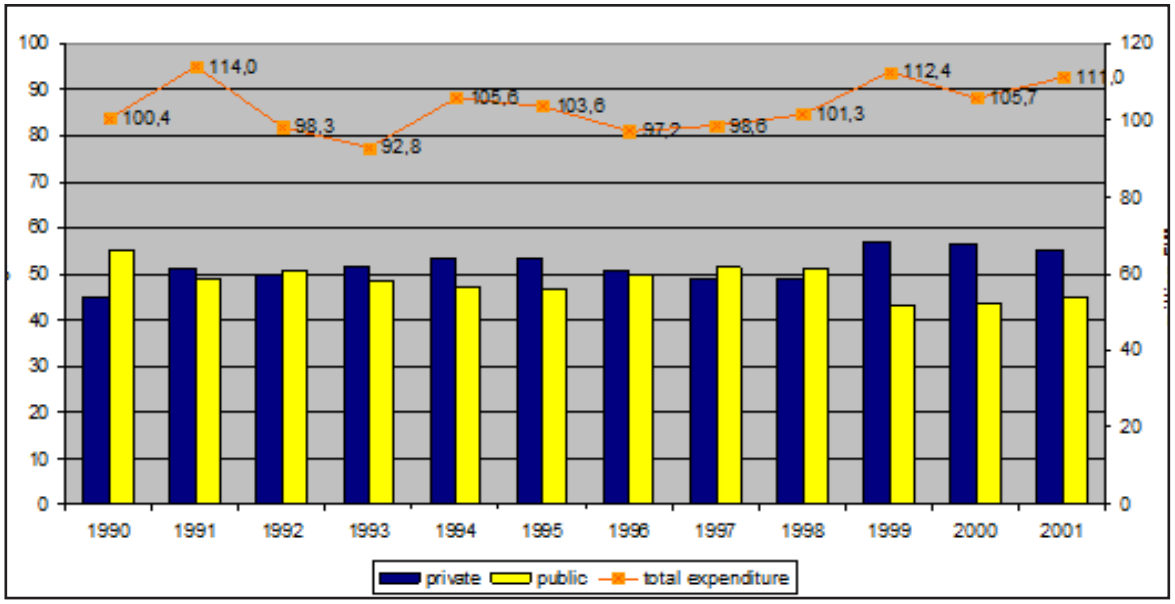
Lappavesi Ltd sells bulk water to municipalities at a rate of 0.24 c/m3. The same bulk water rates are applied to all municipalities. Municipal water tariffs for domestic customers are on average 0.8-1.0 EUR/m3. Water cooperatives mainly apply the same water tariffs as the municipalities (at least in Lapua town).

Financial and economic analysis of the Finnish case-study utilities

LV Lahti Water Ltd

The annual turnover of LV Lahti Water Ltd is about EUR 14 million. Total expenditure of LV Lahti Water Ltd has varied in the 1990s between FIM 92,8 million (EUR 15,6 million) and FIM 114,0 million (EUR 19,2 million) (Chart No 1).

Chart No 1: LV Lahti Water Ltd, total expenditure and the share of private and public sectors in 1990-2001.



The annual turnover (in 2001) is divided so that the share of water sales is 33,5 per cent, wastewater charges 58,5 per cent, and other services 8.0 per cent (LV Lahti Water Ltd, 2003). The profit in 2001 was FIM 3,0 million (about EUR 0,5 million). In 2000 the profit was FIM 4,0 million (EUR 0,67 million).

The company had debts for FIM 3,8 million (EUR 0,64 million) at the end of 2001. The closing figure in the balance sheet (2001) was FIM 420,3 million (EUR 70,7 million). Liabilities were 0.7 per cent of the closing figure in the balance sheet. The rate of self-financing based on income financing of investments was 109.4 per cent. The company did not need loan capital to finance investments in 2002. (LV Lahti Water Ltd, 2003).

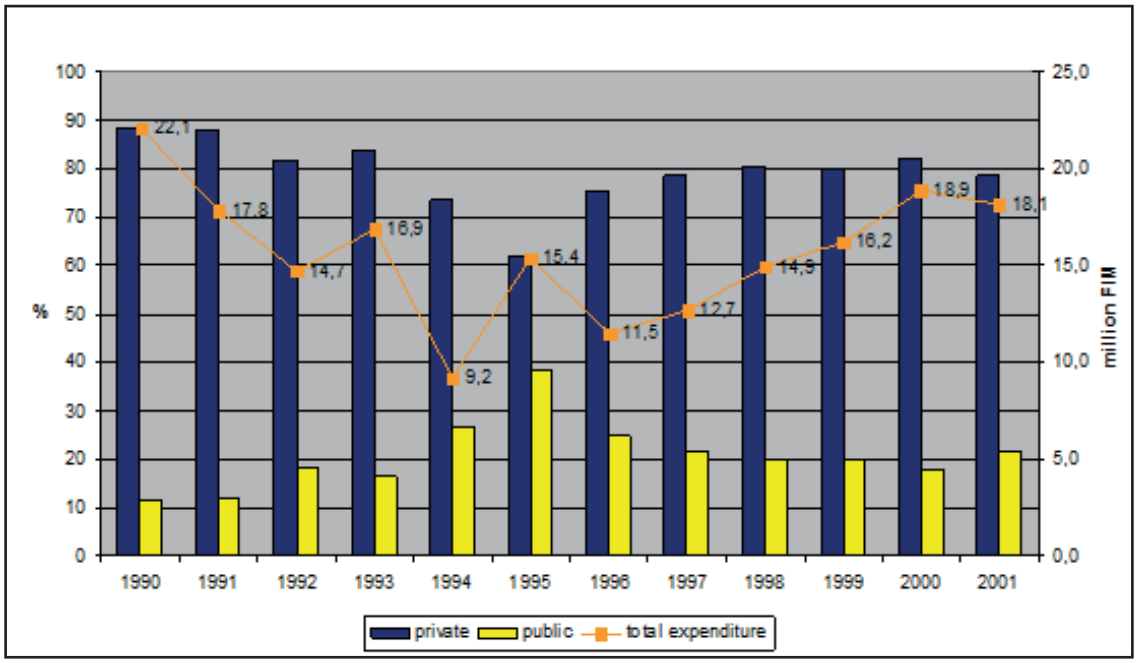
The costs of fixed assets in 2001 were FIM 30,4 million (EUR 5,1 million), of which the personnel costs were about 4 per cent (FIM 1,2 million). Costs of purchasing and rehabilitating buildings and related machinery and equipment were FIM 24,6 million. New equipment were purchased for FIM 1,3 million.

The economic performance of LV Lahti Water Ltd in 2001 was even slightly better than planned, and it was achieved without any increments in the water and wastewater tariffs, which yet were very reasonable when compared to the average tariffs in Finland (LV Lahti Water Ltd, 2003).

Kangasala

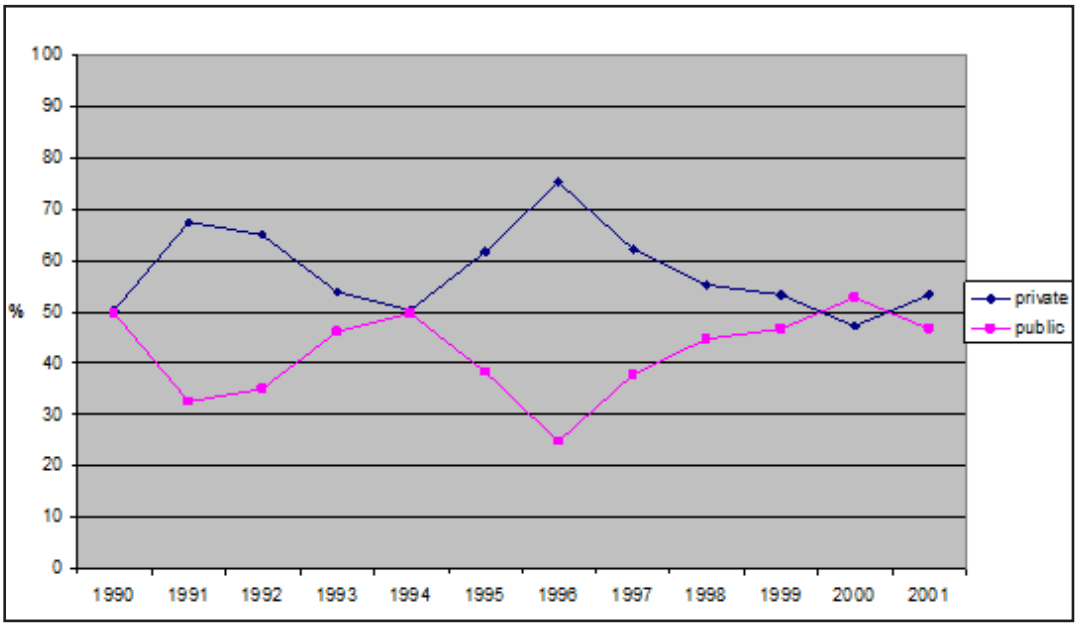
The annual turnover of Kangasala water and sewerage utility is about EUR 2,8 million. Total expenditure of Kangasala water and sewerage utility has varied in the 1990s between FIM 9,2 million (EUR 1,5 million) and FIM 22,1 million (EUR 3,7 million) (Chart No 2).

Chart No 2: Kangasala water and sewerage utility, total expenditure and the share of private and public sectors in 1990-2001.



Kangasala water and sewerage utility is outsourcing services and activities substantially from the private sector (Charts No 2 and 3). The share of the private sector of the total expenditure varies between 45 and 70 percent on an average.

Chart No 3: Kangasala water and sewerage utility, services purchased from the private sector in 1990-2001.



Operational costs in 2000 were about FIM 8,0 million (EUR 1,3 million). In addition there were FIM 0,6 million of water utility expenditure which was recorded as expenditure in other municipal departments. The biggest single expenditure item was the wastewater treatment fee to Tampere City, about FIM 3,7 million.

Water sales revenue in 2000 was FIM 12 million. The operating margin in year 2000 was 33 per cent, which was rather good. This means that about FIM 4 million per annum of the water sales revenue will remain available for investments and as return on investment (ROI).

The book value of the fixed assets of the water utility in 2000 was FIM 37 million. The cumulative acquisition value of the fixed assets is over FIM 100 million, which means that the book value is about one third.

The oldest part of network has been constructed almost 50 years ago. The biggest part of network has been constructed in the late 1960s and in the 1970s. This means that a substantial part of the network is soon reaching its reasonable operational life time. Rehabilitation and replacement investment needs for networks are emerging. The utility has estimated that the annual replacement investments (for networks and plants) in the coming years will be about FIM 3,9 million (EUR 0,5 million). Total cumulative rehabilitation and replacement investments since 1989 have been about FIM 7 million (EUR 1,2 million), which means annually only FIM 600.000 (EUR 100.000).

Based on the rapid population growth and increase of customers, the need for new investments has been estimated at FIM 2,5 million annually. There will be large seasonal variation in the new investments. New investments are mainly covered by connection fees and operational margin of the utility. Only if these will not be adequate to cover

investment costs, the owner (municipality) will have to spend additional capital to the utility. Another possibility is that the utility takes additional loans from the municipality or from external borrowers. The utility had liabilities in 2000 for about FIM 3 million, with interest payable for about FIM 30.000.

The gross investments of Kangasala municipality in 2000 into water and wastewater services were as indicated in Table No 13.

Table No 13: Kangasala municipality, gross investments in water supply, 2000.

INVESTMENT	FIM total	FIM / inhabitant
Water distribution network	2,965,076	133
Sewerage network	4.353.709	198
Sewerage equipment	7,000	0
TOTAL	7,325,785	331

Lappavesi Ltd

The annual turnover of Lappavesi Ltd has been during the recent years about 1 million euro. Total expenditure of Lappavesi Ltd has varied in the 1990s between FIM 4,2 million (EUR 0,7 million) and FIM 15,1 million (EUR 2,5 million) (Charts No 4 and 5).

Lappavesi Ltd is outsourcing services and activities substantially from the private sector. The share of the private sector of the total expenditure varies between 60 and 80 percent on an average.

Chart No 4: Lappavesi Ltd, services purchased from the private sector in 1990-2001.

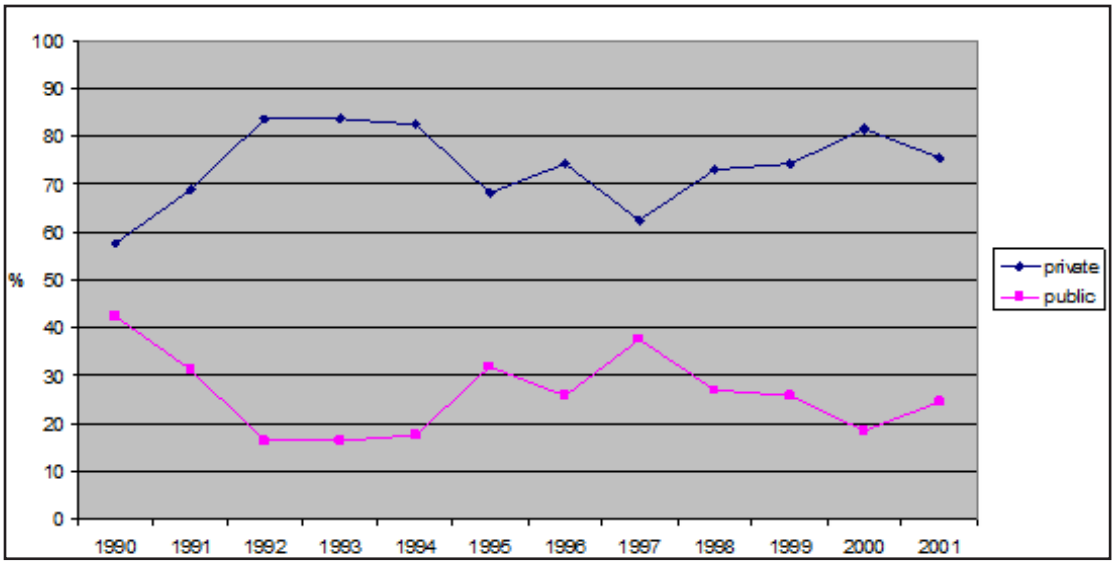
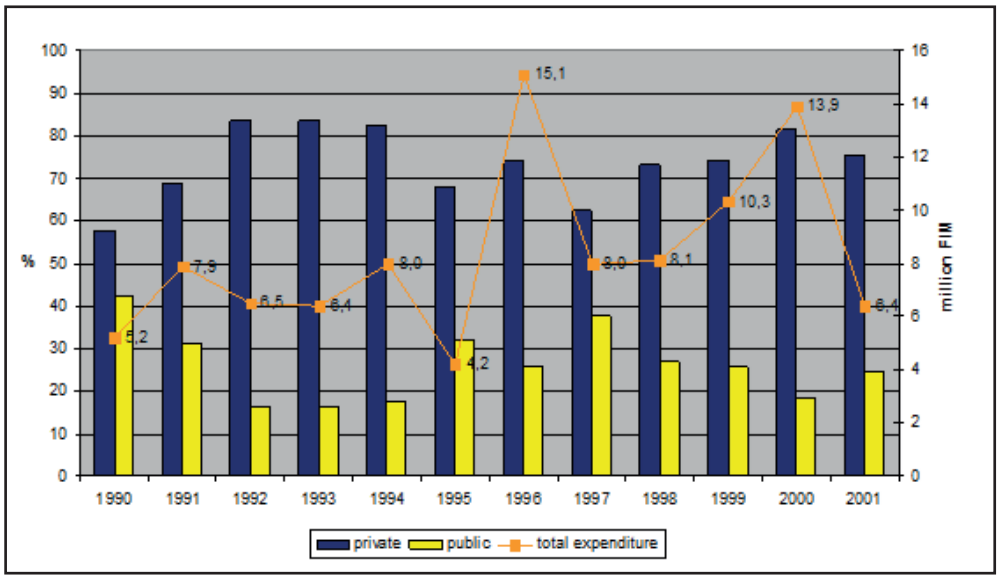


Chart No 5: Lappavesi Ltd, total expenditure and the share of private and public sectors in 1990-2001.



Lapua Sewerage Ltd

The annual turnover of Lapua Sewerage Ltd is about 1,8 million euro. Total expenditure of Lapua Sewerage Ltd has varied in the 1990s between FIM 2.4 million (EUR 0,4 million) and FIM 11.4 million (EUR 1,9 million) (Charts No 6 and 7). Lapua Sewerage Ltd is outsourcing services and activities substantially from the private sector. The share of private sector of the total expenditure has been about 90 per cent on an average.

Chart No 6: Lapua Sewerage Ltd, services purchased from the private sector in 1990-2001.

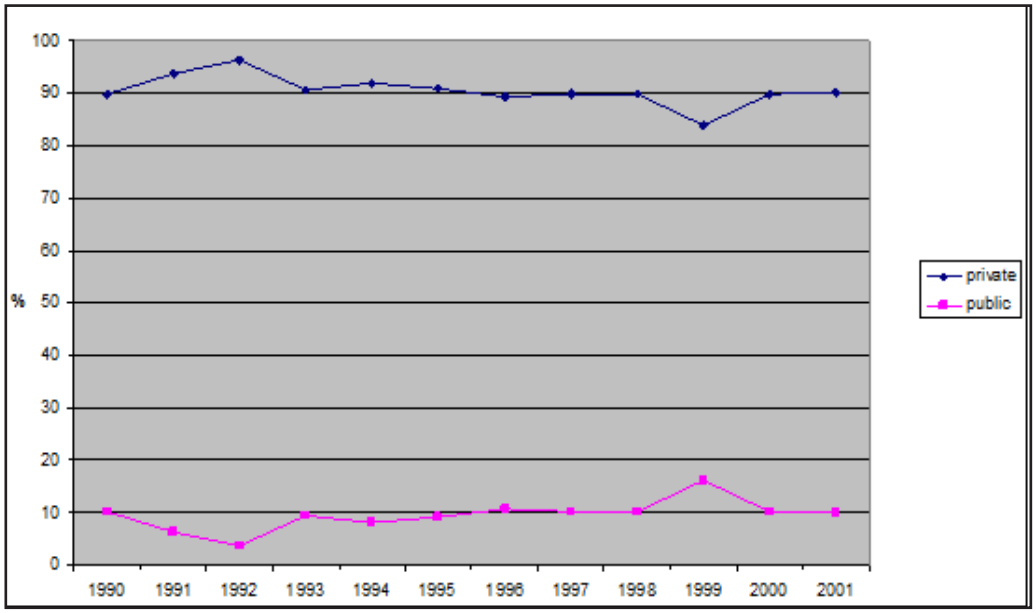
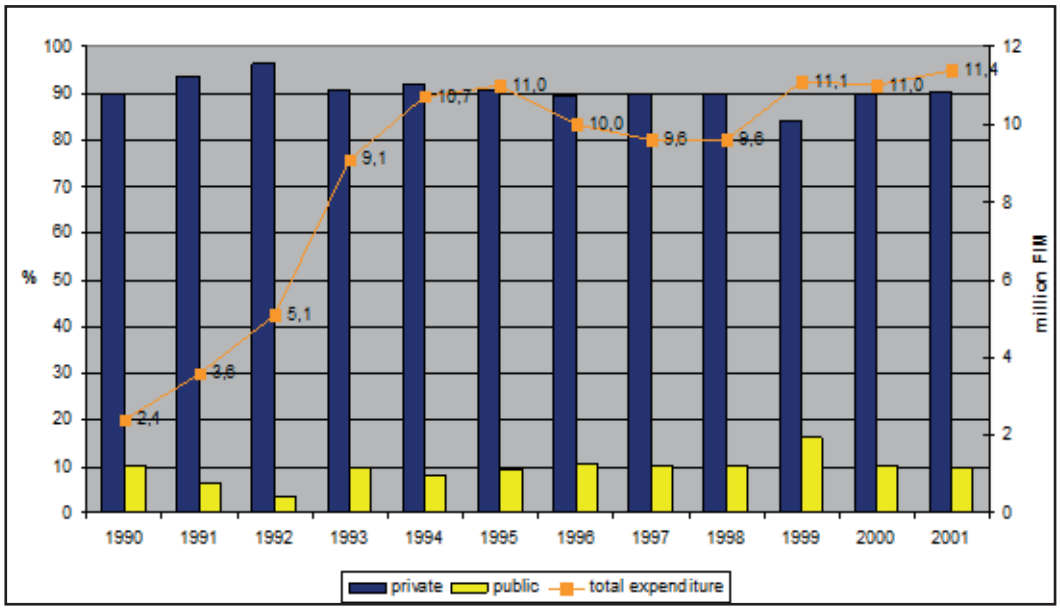


Chart No 7: Lapua Sewerage Ltd, total expenditure and the share of private and public sectors in 1990-2001.



These figures are based on the income statement of the companies. Therefore, they may contain even rough estimates. However, the figures have partly been cross-checked through personal communication with the Managing Director.

Lappavesi Ltd used to have very low debt rate in the past, but during the recent years it has increased its debt financing and invested more. Bulk water tariffs have been kept reasonably low due to increased debt financing. The amount of debts is currently about EUR 1 million, which is roughly equivalent to the annual turnover. The operational margin of Lappavesi Ltd is currently about 40 to 50 per cent. Since 1997 Lappavesi Ltd has been taxed for its annual income.

Lappavesi Ltd's annual turnover (expenditure) is roughly divided to the following:

- Personnel about EUR 0,23 million
- Equipment and materials about EUR 2,3 million
- Depreciations about EUR 0,33 million
- Financing costs about EUR 0,05 million
- Other costs about EUR 0,05 million.

For the last five years the investment level of Lappavesi Ltd has been about EUR 0,67...0,83 million. Lappavesi Ltd applies personal securities for the loans, which keeps loan servicing costs low. The company can decide independently on its investments.

This ensures dynamic operation. Even in the case of debt financing the total time required for availing the funding after investment decision may be maximum 1,5-2 months. The flexibility of the joint-stock company is much bigger than it would in the case of municipal water works subjected to municipal council decision-making process.

Socio-cultural and political aspects

Water services are discussed fairly little in Finland. The debate is mainly concentrated among the sector professionals. The public and customers are not much involved in the discussion. Water services function traditionally well, which may explain why there is not much public debate on it. It seems, however, that majority of the Finnish citizens still prefer that water and sewerage services would be retained as a municipal service (KTV, 2003). In a recent survey (KTV, 2003), 51 per cent of the interviewees consider that water services are essential basic services that should be provided by the municipalities also in the future.

There is a current heated debate in Finland about the number of municipalities. Finland has still over 400 municipalities (448 in 2002), but there is an ongoing debate whether the number of municipalities should be reduced and to what extent. Municipalities have during the recent years had increasing economic problems. Especially small municipalities have difficulties in carrying out all their service obligations. This is caused by: (1) the growing number of duties and obligations set to the municipalities, (2) the reducing number of inhabitants and taxpayers in small municipalities, and (3) decreasing state subsidies for municipalities.

The smallest municipalities have increasing difficulties to manage their water utilities in an efficient and economically self-sufficient manner. On the other hand, larger municipal water utilities are doing economically well, and actually have earned substantial profits to their owner municipalities. In most cases these profits have not much been used to develop water services, but they have been used as "hidden taxes" to finance municipal services in other – less profitable – sectors.

There are no actual "social tariffs" in use in Finland, meaning that in domestic use water tariffs would be progressive or be based on increasing-block rates. Basically, all domestic customers within the same utility pay equal volumetric charge per m^3 of water used, independent on the quantity. Also the new Water Services Act states that the volumetric user charges should be uniform throughout the utility's service area, but other (fixed) charges may vary. Block rates may be used for commercial and industrial customers in some cases.

Summing up

Finland has abundant resources of high quality raw water. About 60 per cent of drinking water is derived from groundwater, of which some 10 per cent is artificially recharged groundwater, and it usually requires little or no treatment. The rest of the drinking water is obtained from surface waters, i.e. from rivers and lakes.

Finnish water and sewerage utilities can be classified into three main categories based on the organisational and functional model:

1. Small private water associations serving country communities and sparsely populated areas within municipalities.
2. Municipal utilities serving population centres and municipalities.
3. Supra-municipal utilities.

Municipalities are responsible for the general development of water and sewerage services in their jurisdiction. The municipal council makes decisions concerning the general bases for charges for municipal and other services. The water and sewerage utilities, which are mainly owned by the municipalities, produce water and sewerage services in their service territory. Utilities are monitored and controlled by the municipal health protection and environment protection authorities.

In the Finnish case, private sector involvement is understood in a broad manner, including also outsourcing non-core and support services and goods, incorporation of utilities, commercialisation of utilities, (small) private water associations and co-operatives, etc.

Finland has a long and extensive experience in public-private cooperation in the water supply and sewerage sector, although perhaps not in the sense that public-private partnership is often understood (i.e. private finance initiative). Outsourcing of services – especially non-core services – of public water utilities in Finland is very extensive. Outsourced services can form as much as 60-80 per cent of the utility's turnover (cash flow) in many utilities.

The selected Finnish case studies (LV Lahti Water Ltd, Kangasala municipal water and sewerage utility, Lappavesi Ltd and Lapua Sewerage Ltd) all clearly follow this common trend of substantial outsourcing of non-core services and goods from the private sector. The share of private operations in the annual turnover or cash flow of these water utilities has varied between 45 and 90 per cent. Since most of these private services are procured on the basis of competitive tendering usually on a rather short-term basis, this model has provided for high efficiency and competition within the publicly owned utilities. The largest Finnish water utilities are doing rather well in economic and financial terms. This applies also to the case study utilities, which are economically healthy and profitable.

The "Finnish type of public-private cooperation" has worked well over a long period of time, and thus there has not been high pressure towards other types of private sector

involvement, such as private ownership of utilities or operational concession contracts. There have also been substantial efforts in improving the efficiency and transparency of the municipality owned water utilities in the recent years. These have included adoption of commercial operational principles and net-budgeting towards increasing autonomy from the municipality, and enforcement of new water services legislation which has enabled diverse types of service provision and management. Incorporation of municipal water utilities has gradually increased, and there is also a strong trend towards regional cooperation on a supra-municipal basis – often involving establishment of stock companies owned by several municipalities. Direct private sector involvement in operations and management of water services is also emerging, but currently at a reasonably low key.

Synthetic analysis of results

The Finnish case study was looking into the key principles and practices of public-private cooperation in water services based largely on local government (municipality) owned utilities which cooperate with the private sector. Such systems have a long tradition in larger Finnish cities and townships though many of them are fairly small compared with other European countries. In any case, this is the most common management model of water services in the EU member countries. It is important to note that the public involvement includes not only the state level, but also the regional and municipal (local) level.

In the Finnish case, private sector involvement is understood in a broad manner, including also outsourcing non-core and support services and goods, incorporation of utilities, commercialisation of utilities, (small) private water associations and co-operatives. This option of municipality-owned utilities has several alternatives like the traditional municipal utility, an autonomous utility, a company owned by the municipality or an inter-municipal utility. In sparsely populated areas, joint water service systems are managed by private water cooperatives whose funding and operation are nevertheless in most cases supported by municipalities. Consumer-managed water and sanitation cooperatives in dispersed rural areas and small villages are largely private of their nature. Supra- and inter-municipal cooperation of water utilities is an increasing trend in Finland.

From Finland three case study utilities were selected:

1. LV Lahti Water Ltd is a joint-stock full service water company owned by the city of Lahti in the southern part of Finland (population about 100,000).

2. Kangasala municipality water and sewerage works is a municipal water and sewerage utility, which has been reformed as an autonomous municipal enterprise in 2002. It is responsible for drinking water supply and distribution, wastewater sewerage, and storm water drainage. The utility serves about 19,000 people within the area of Kangasala municipality.

3. Lappavesi Ltd is a bulk water supply (joint-stock) company owned by the municipalities of Lapua, Nurmo, Kuortane and Kauhava in the region of Southern

Ostrobotnia in Western Finland. The population within the service area of Lappavesi Ltd is about 35,000. Lapua Sewerage Ltd is a joint-stock sewerage company owned by the municipalities of Lapua and Nurmo, and the Atria Oyj food processing company.

This report highlights the key findings from the Finnish case study in the first section. These are based on the three case study utilities and also on other relevant studies done by the CADWES research group at TUT/IEEB. In the second section, 3 tentative scenarios for alternative futures for WSS services in Finland are presented, with a view to the role of PSP in future WSS services. Section three provides a brief conclusion of the key findings from case studies and developed scenarios.

Key findings of the Finnish case study

The key findings from the Finnish case study are based on the PRINWASS case study report and other relevant studies carried out by the CADWES research group. The key findings are structured around the three key analytical dimensions of PRINWASS:

- Policy-institutional dimension
- Economic-financial dimension
- Socio-political and cultural dimension.

In brief, the main findings from the Finnish case study are the following:

- Water services in Finland are still predominantly owned and managed by municipalities (local authorities), which have been recently transformed into autonomous municipal enterprises, operating with commercial and self-financing principles.
- Private sector involvement is still mainly limited to extensive outsourcing of non-core services and goods from different types of private companies (consultants, contractors, suppliers, etc.). Private operation of water utilities is emerging, but is currently still at a low level.
- Regional cooperation is increasing. Municipalities look for increased cooperation in providing water services, and also some regional water and sanitation companies – owned by several municipalities – have been established recently.
- The Finnish legislation on water services was renewed in 2000/2001. The new legislation treats both public and private water service providers equally. There is not yet, however, any detailed economic regulatory system in place.

Policy-institutional aspects

Finnish water and sewerage utilities can be classified into three main categories based on the organisational and functional model:

1. Small private water associations serving country communities and sparsely populated areas within municipalities.
2. Municipal utilities serving population centres and municipalities.
3. Supra-municipal utilities.

In Finland municipalities are responsible for the general development of water and sewerage services in their jurisdiction. The municipal council makes decisions concerning the general bases for charges for municipal and other services. The water and sewerage utilities, which are mainly owned by the municipalities, produce water and sewerage services in their service territory. Utilities are monitored and controlled by the municipal health protection and environment protection authorities.

In the Finnish case, private sector involvement is understood in a broad manner, including also outsourcing non-core and support services and goods, incorporation of utilities, commercialisation of utilities, (small) private water associations and co-operatives. Finland has a long and extensive experience in public-private cooperation in the water supply and sewerage sector, although perhaps not in the sense that public-private partnership is often understood (i.e. private finance initiative). Outsourcing of services – especially non-core services – of public water utilities in Finland is very extensive. Outsourced services can form as much as 60-80 per cent of the utility's turnover (cash flow) in many utilities.

The "Finnish type of public-private cooperation" has worked well over a long period of time, and thus there has not been high pressure towards other types of private sector involvement, such as private ownership of utilities or operational concession contracts. There have also been substantial efforts in improving the efficiency and transparency of the municipality owned water utilities in the recent years. These have included adoption of commercial operational principles and net-budgeting towards increasing autonomy from the municipality, and enforcement of new water services legislation which has enabled diverse types of service provision and management. Incorporation of municipal water utilities has gradually increased, and there is also a strong trend towards regional cooperation on a supra-municipal basis – often involving establishment of stock companies owned by several municipalities. Direct private sector involvement in operations and management of water services is also emerging, but currently at a reasonably low key.

Finnish regulations and laws related to water and sewerage services can be categorised into four main groups: water services legislation, health protection legislation, water and environmental protection legislation, and other related legislation. EU directives are put into effect by the Finnish legislation. Thus, directives as such are not directly binding on a Finnish citizen, only on the State of Finland.

The national legislation related to water resources and services in Finland was to a large extent renewed in the beginning of the 2000s. The most important law regarding water services provision in Finland is the Water Services Act (119/2001), which was enacted in 2001. It is based on the EU Water Framework Directive (2000/60/EC) and it contains provisions on the development of the water services as well as organisation of water services and rates. Other important laws affecting water services are the Environmental Protection Act (86/2000), amended Health Protection Act (120/2001), the Local Government Act (365/1995), and the amended Water Act (121/2001). The Water Act is currently under review and the new Water Act is expected to be enacted in 2004. The Government Decree on Treating Domestic Wastewaters in Areas Outside Sewer Networks (542/2003) was enacted in 2004. This Decree imposes substantial changes for wastewater treatment in rural areas.

Water Services Act clarifies the liabilities of the municipality, and defines that municipalities have the responsibility for overall development and organising of water and sewerage services in their jurisdiction. In practice, this means that the municipality has to make water services development plans to cope with the municipality development. On the other hand, the water and sewerage undertaking is responsible for taking care of the water services management within its water services area. Water Services Act is applied to all water and sewerage undertakings regardless of their ownership or management model.

Water Services Act also defines that the key principle is that charges should cover all the investment and operating costs. In principle all types of water service undertakings are treated on equal basis. Municipal water undertakings should separate their budgeting and accounting from the general municipal budget. In practice, most of the larger utilities have already reformed their utilities to autonomous municipal enterprises.

Water Services Act does not stipulate in details the roles and responsibilities of the different regulatory authorities, and thus their powers and general and based on the statutory powers of the respective authority (the Regional Environment Centre, the municipal health protection authority and the municipal environmental protection authority). The Consumer Ombudsman will control the compliance with the law of the general supply conditions in respect of consumer protection (Ministry of Agriculture and Forestry, 2001 and 2002).

Economic-financial aspects

The municipality-owned and managed water and sewerage utilities in Finland perform on average fairly well in economic and financial terms – especially the largest utilities. On the other hand, the smallest municipalities have increasing difficulties to manage their water utilities in an efficient and economically self-sufficient manner. Because many municipalities in Finland have had severe economic and financial constraints – partly due to continuously increasing service obligations and decreasing state subsidies – they have considered selling their utilities to generate funds and easy cash flow. Some municipalities have already sold their electricity utilities, but none have sold their water utilities, although some municipalities have considered it.

The selected Finnish case studies (LV Lahti Water Ltd, Kangasala municipal water and sewerage utility, Lappavesi Ltd and Lapua Sewerage Ltd) are economically healthy and profitable, and actually have earned substantial profits to their owner municipalities. In most cases these profits have not much been used to develop water services, but they have been used as "hidden taxes" to finance municipal services in other – less profitable – sectors. The fact that the larger utilities in Finland have been able to produce high rates of return to investment to their municipal owners is an indication that water and sewerage charges in many cases have been set at a higher level than would have been necessary for self-sustaining operations. The new Water Services Act (2001) touches the high rates of return by stating that utilities can only impose a "reasonable rate of return", which however is not clearly specified. The Competition Authority also has not been able to interpret the term "reasonable" clearly.

The case study utilities follow the common trend of substantial outsourcing of non-core services and goods from the private sector. The share of private operations in the annual turnover or cash flow of these water utilities has varied between 45 and 90 per cent. The share has been high especially during periods of large investments, since municipalities and their utilities use extensively private companies in planning, design and construction of WSS infrastructure. Since most of these private services are procured on the basis of competitive tendering usually on a rather short-term basis, this model has provided for high efficiency and competition within the publicly owned utilities.

Regional cooperation between municipalities and utilities has increased in Finland in recent years. Cooperation is seen as a means of improving efficiency and ensuring adequate resources especially in the case of small municipal water utilities, which have had difficulties with their economy.

Socio-cultural and political aspects

Water services are discussed fairly little in Finland and they do not raise a lot of attention among the general public and customers. Water services function traditionally well, which may explain why there is not much public debate on it. It seems, however, that majority of the Finnish citizens still prefer that water and sewerage services would be retained as a municipal service (KTV, 2003). In a recent survey (KTV, 2003), 51 per cent of the interviewees consider that water services are essential basic services that should be provided by the municipalities also in the future.

Participation mechanisms

The Constitution of Finland (731/1999, Finlex 2004d) stipulates that the powers of the State in Finland are vested in the people, who are represented by the Parliament. Democracy entails the right of the individual to participate in and influence the development of society and his or her living conditions. The exercise of public powers shall be based on an Act. In all public activity, the law shall be strictly observed.

In accordance with the Local Government Act (365/1995), the municipal council has to take care of that the inhabitants and the users of the services have the possibilities to participate in and influence the activities of the municipality. The participation and influence can be enhanced particularly, among other issues:

1. by nominating representatives of the service users into the municipal bodies;
2. by notifying about the municipal matters and by organising the hearings;
3. by finding out the inhabitants' opinions before the decision-making;
4. by arranging cooperation in the municipal duties management;
5. by assisting the inhabitants' spontaneous action regarding the management, preparation and planning of activities; and
6. by arranging municipal referendums.

In practice, many municipal water and sewerage undertakings have actively advocated the inhabitants living outside the water services area of the water and sewerage undertakings, how to establish and organize water services associations, their management, and given advice about the planning, construction and operations and maintenance of the undertakings. The municipalities can also nominate the representatives of the service users to the board of the directors of the undertakings, and normally they have nominated the members only on political grounds.

The inhabitant also has the right to take the initiatives to the municipality concerning its activities in accordance with the Local Government Act. The municipality has to notify the inhabitants on the matters under preparation in the municipality, on the corresponding plans, on the decisions made and on the subsequent impacts. The municipality has to prepare, if deemed to be necessary, the briefs concerning the municipal services, economy, environmental protection and land use. The inhabitants have to be informed also, how the questions and opinions can be expressed to the municipal officials and the decision makers.

In accordance with the Water Services Act (119/2001), the municipality must make sure that appropriate measures are taken to establish a water and sewerage undertaking to meet the needs, to expand the water services area or to otherwise secure the availability of sufficient water services. Before taking the measures, the municipality must reserve an opportunity for property owners and occupiers in the area to be heard. A municipality will approve the water services area of water and sewerage undertaking operating within its territory and, when necessary, will amend an approved water services area on the submission of the undertaking or, if the undertaking has presented no such submission, after hearing the undertaking. Before the approval or amendment of the water services area, a statement on the matter must be requested from the control authority, and an opportunity must be reserved for the property owners and occupiers

in the area to be heard. Furthermore, the Water Services Act stipulates that a water and sewerage undertaking must notify the customer well before: i) any modifications to the general conditions of water services contract; ii) how and when the charges and other conditions will change; and iii) what is the reason for the modification.

Scenarios for the development of water services in Finland and the role of PSP

Scenarios for the alternative futures of water and sanitation services sector in Finland have been developed utilising several previous studies and findings from the Finnish case studies of PRINWASS. An important starting point was the preliminary study done in the late 1990s for the National Technology Agency (Tekes) about the future of Finnish water services sector in the 2000s (Vikman, 1999). The CADWES research group at IEEB/TUT has thereafter carried out a number of futures-oriented studies, which have produced useful background material for scenario development. In connection with the strategy development for Vaasa water utility, relevant scenario material was developed in cooperation between IEEB/TUT and Vaasan Vesi (Vaasa Water) (Hahto, 2004).

The Management and Economic Committee of the Finnish Water and Waste Water Works Association (FIWA) prepared a publication "Development and survival strategy of water and sewerage utilities" (FIWA, 2003) to be used as a guideline for its member utilities in their strategic development. The publication does not include any scenarios for alternative futures of Finnish water utilities or WSS sector, but it discusses thoroughly the changing operational environment and includes a SWOT analysis. Thus, it can be effectively used as a tool in developing scenarios and strategies for the Finnish WSS sector. The publication includes a concise appendix showing the strategic goals and objective for water and sewerage utilities up to the year 2020.

In the following, a general SWOT analysis is presented on the current situation with water services in Finland. This SWOT analysis is a combination of contributions from several sources.

Table No1: SWOT analysis of the water services in Finland (modified from Vikman, 1999; Katko et al, 2000; FIWA, 2003).

STRENGTHS (S)	WEAKNESSES (W)
• Abundant and high quality water resources. • Covering and high quality water services in population centres. • Stable institutional environment (legislation, permit procedures, authorities, ownership). • High technology and professional skills. Utilities have experienced and knowledgeable staff. • Water infrastructure is in general fairly new and in good condition. • Drinking water quality is good in international comparison. • Wastewater treatment is at a very high level. • Customers appreciate and value water services and utilities. •Water services are considered one of the most important municipal services, together with basic education and health care services. • Financing of water services operations can be well covered by customer charges. Good willingness- and ability to pay and stable revenue base.	• Outside the organised water and sewerage systems there are problems with drinking water quality and wastewater treatment. • Small size of systems / utilities limits technological and economic development. • Political interference in municipalities affects decision making and development in water utilities (although autonomy is increasing). • Bureaucratic and conservative culture within the authorities. • Unclear ownership policies. • Inadequate attention to strategic and visionary management in water utilities. Poor preparedness for institutional changes. • Inadequate preparedness for exceptional situations and crises. • Inadequate investments to rehabilitation and replacement of infrastructure. • Low interest towards water services among general public and politicians, because service is good.
OPPORTUNITIES (O)	**THREATS / LIMITATIONS (T/L)**
• Increasing efficiency and productivity by (1) merging utilities, (2) promoting regional cooperation, and (3) outsourcing and competition. • Utilisation of new technologies (ICT, GIS, etc.). • Successful "capturing" of competent and motivated young water sector professionals. • Promoting export and international trade through the image of high quality water services (e.g. foodstuff industries). • New potential for companies specialising in O&M of small water and wastewater treatment facilities (rural and peri-urban areas). • Networking of actors in water services. • International and foreign companies may bring additional resources and capacity to the decreasing Finnish market in water services.	• Deterioration of raw water sources and/or other exceptional situations. • Lack of competent and experienced sector professionals (current staff is ageing). • Inadequate or inappropriate education and training systems in water services. • Increasing competition for economic and other resources. • Increasing uncertainty about future operational environment (decreasing predictability). • Changes in the municipal administration may cause unpredictable changes in water services. • Uncontrolled monopoly situation. • More stringent requirements by the EU and other authorities. Expansion of EU. • Intrusion of large multinational companies into the Finnish water services market. Opening of markets.

Four overall scenarios have been built based on the SWOT analysis and various material related to the analysis of the Finnish water and sewerage services sector. These scenarios have the following working titles and main features:

S1 : "Business-as-usual" "BAU"
S2 : "Public sector predominance" "IN THE PUBLIC INTEREST"
S3 : "Diversified and balanced" "INSDIVERSITY"
S4 : "Private sector predominance" "PRIVATE EFFICIENCY"

The four scenarios have the following common features:

- Environmental issues become important
- Discharge limits and drinking water quality requirements become more stringent
- Legislation, including "reasonable ROI", privatisation is legally allowed
- Financing is based on revenues from customer charges
- Demand for transparency
- Population is ageing
- Development of information society sets increasing requirements for education

The scenarios have the following main differences between them:

- Set of values
- Influence of economic life and business society
- Hard competition in commercial and industrial life
- The role of EU in water services regulation and legislation
- Economic situation of Finland and its municipalities
- Regional cooperation
- Concentration vs. dispersion of population / settlements
- Ownership and operation of water utilities, private vs. public
- Competition for employees
- Quality and coverage of services

In the following, some main features and key driving forces of these scenarios are presented.

S1: "Business-as-usual"

No major changes in the overall situation of water supply and sanitation and the general organisation of basic services in the country until 2025. The overall scenario is characterised by the following driving forces and trends:

Dynamic driving forces and trends in this scenario:

- Economy is an important factor in politics
- Global and liberal economy, hard economic competition, sensitive to economic cycles
- Overall concentration: population, jobs, companies, ...
- Hard competition for (educated) labour
- Work is a mean of self-fulfilling, career is important
- Retirement age will be raised
- High technology
- Finnish primary production competes with purity
- No major changes in attitudes and practices
- Polarisation of society
- Imbalanced development of the country
- Competition between municipalities (and regions)
- The influence of municipalities in politics decreases, but their responsibility for financing increases
- Municipal mergers are common
- Citizens are selective customers, but their influence is limited
- Municipalities change from service producer to service facilitator, trend for privatisation through competitive bidding for services
- Social services are financed by customer charges
- Ownership of water infrastructure remains with municipalities, but operations are delegated and outsourced from private sector
- Some (largest) incorporated water utilities do well in competition and expand their services to other municipalities
- Competition includes also international companies and multi-utilities, e.g. some energy companies
- Due to increased competition economic regulation is increased
- Achieving more stringent wastewater treatment standards complicated systems and processes are needed, which leads to large, supra-municipal treatment plants
- Charges are clearly increasing due to more complicated and expensive treatment and ICT technologies

In WSS, this scenario means that municipalities continue owning water utilities, but private sector still has an important role as the producer of goods and services through outsourcing and competitive bidding. The requirements set by the European Union will have an increasing impact on the regulatory framework, and competition will increase over the national borders.

S2: "Public sector predominance"

WSS will continue being predominantly in public hands – i.e. owned by the municipalities and controlled by public authorities – until 2025. The overall scenario is characterised by the following driving forces and trends:

Dynamic driving forces and trends in this scenario:

- Scattering, localisation: power, jobs, education, housing, culture
- Networking, cooperation; the network is flexible and diversified
- Information and communication networks become increasingly important
- Social and cultural issues become important, weekly working time gets shorter
- Second homes" become common
- Difference in lifestyle between rural and urban areas: e.g. independent initiatives vs. organised services; citizens' activity and demands are an important driving force
- Changing ways of life: sustainable development, decreasing consumption patterns
- Environmental awareness and problems become more important
- "Think globally, act locally"
- Differentiation of continents, key trading markets of Finnish companies are Europe and Russia
- Companies are deciding their location based on logistical reasons
- Decelerating economic growth – emphasis on quality instead of quantity
- Interest towards privatisation fades out in the EU; opening up water services for market stops; municipalities retain ownership and operation of water services
- Outsourcing of non-core services from the private sector remains extensive
- Staff of utilities establish their own companies e.g. for network maintenance and sell their services for several utilities
- Regional water service companies and/or regional cooperation of municipal water utilities become common – yet regional companies remain rather small; more cooperatives established in rural areas
- More stringent environmental standards (nitrogen removal, chemicals, etc.); better raw water quality due to gradually decreasing pollution and easier treatable wastewaters; sludge reclamation increases; separating and composting toilets become more common (both in urban and rural areas)
- Charges for water abstraction and wastewater disposal will be imposed; water consumption will decline; water reuse and recycling increases; dual water systems
- Increasing risk of terrorist attacks also in water supply even in Finland

In WSS, this scenario means a slightly more determined and informed decision to develop basic services along the public service domain than in the BAU scenario (which is based on a more undetermined development).

S3: "Diversified and balanced"

In this scenario the organisation of WSS will be characterised by a diversity of arrangements between the public and private sectors regarding ownership, operation and control of the systems. The overall scenario is characterised by the following driving forces and trends:

Dynamic driving forces and trends in this scenario:

- Finland's economy is doing well
- Yet, sudden structural changes may affect the economy and municipalities
- International economy and increasing international competition affects both the public and private sector
- Success of international organisations and companies boosts also the Finnish economy
- Water services sector is directly benefitting from the success of Finnish water sector companies
- Concentrating in key sectors, e.g. export of environmental technology
- Environmental policy and environmental values influence
- Division of power between the EU and the national parliament
- Municipalities have a high degree of self-government
- Citizens are active and have reasonably good avenues for influencing issues
- Development of the Nordic welfare model regains support; reorganisation of services
- Water services will be retained mainly in municipal ownership; yet the private sector may even own some WSS utilities, and outsourcing of goods and services from the private sector will be increased even from the present high level
- Instead of straight-forward competing, benchmarking of costs and quality will become important for water utilities
- Regional thinking and cooperation is important; regional water and sewerage companies become more common
- Resource banks are developed to alleviate lack of human resources in public utilities

In principle, this scenario continues and strengthens the ongoing trend of diverse institutional and management arrangements in the provision of WSS services in Finland. Experiences from different arrangements facilitate competition and efficiency among the utilities and lessons from the successful arrangements can be utilised in other areas. Flexibility and adaptation to local and regional conditions is a leading

principle. The regulatory framework will be developed to cope with the wide range of arrangements, but also the regulatory system will be rather lenient to allow flexibility and self-regulation to a certain degree.

S4: "Private sector predominance"

In this scenario, WSS will increasingly become managed and in many cases also owned by the private sector – until 2025. This development is mainly caused by the gradual failure of public (municipality owned and managed) water utilities to perform their service obligations properly. The overall scenario is characterised by the following driving forces and trends:

Dynamic driving forces and trends in this scenario:

- Global, tough competition, slow economic growth
- Decision-making power shifts from the national parliament to the EU – including budget decisions
- Finland continues being an "obedient student" in the EU, being among the first counries to act
- Internal subsidies of the EU decrease drastically
- New recession, increase of unemployment and reorganisation of welfare society
- Financial responsiblity of municipalities increases and their self-government increases, but municipalities have severe difficulties to carry out their duties
- Small municipalities are forced to cooperate, rural areas become desolate
- Municipal infrastructure deteriorates due to inadequate maintenance funds
- Municipalities incorporate their technical services and some sell their utilities
- The employees of municipalities are ageing and staff is reduced
- EU tightens up its environmental policy and taxation, discharge standards, etc.
- Finland has to invest also in its neighbouring regions and especially in environmental problems in the Baltic Sea region
- Municipalities get more responsibility in environmental issues, for instance they raise environmental charges
- Citizens' possibilities to influence are limited)continued)
- Regulation and control of water services shifts to the EU
- A regulatory system similar to the energy sector will be established for water services
- Wastewater treatment is becoming more expensive due to stringent environmental requirements

(continued)

- Desolution due to migration causes water charges revenue to decline in rural areas, but yet old infrastructure requires rehabilitation and maintenance
- Municipalities sell their water utilities to incur cash in their poor financial situation; e.g. banks and pension schemes are interested buyers
- BOT contracts become common in larger towns, but they have typical problems with large multinational companies
- Vandalism against water systems increases as a result of declined socio-economic situation of some vulnerable groups

This scenario is characterised by an increasing and strong private sector entrance to WSS sector, both as operators and owners of utilities (Finnish and international companies). Economic efficiency gains determine most of the strategic decisions regarding technical services.

Some of the latest developments in Finland have signs that may be related to the last scenario (S4). In Lahti city, there have been proposals and discussion about arrangements with the municipality owned energy and water services companies that can be considered ethically questionable.

First, regarding LV Lahti Water Ltd, a couple of years ago there was discussion about cross-border leasing of utility assets (water supply networks) to USA with an aim to evade taxes. This plan, however, never materialised.

Second, in 2004, external corporate consultants made proposals to divide and re-incorporate the current municipality-owned companies (Lahti Energy and LV Lahti Water Ltd). Both companies would be divided into two separate companies: one for running the service operations and one for owning the network assets. In the next stage, Lahti city would sell the shares of its network assets owning companies to a newly established company (NewCo). The proceeds of this sale would be tax exempted for the city. At the same time, Lahti city would buy shares of NewCo and thus gain decision-making power (nomination of board of directors) in the network owning company.

The proposed arrangements have raised criticism among the municipality and other stakeholders. The arrangement also evades energy market regulations and the EU competition regulations. Besides tax evation, this arrangement cannot create any fresh capital. Instead, the network owning company – which has no other source of income expect its distribution network income – has to draw its costs from Lahti Energy and LV Lahti Water Ltd. This again, in the long run, may cause pressures to increase customer charges considerably.

Conclusions

In Finland, water services are still predominantly owned and managed by municipalities (local authorities), which have been recently transformed into autonomous municipal enterprises, operating with commercial and self-financing principles. Private sector involvement is still mainly limited to extensive outsourcing of non-core services and goods from different types of private companies (consultants, contractors, suppliers, etc.). Private operation of water utilities is emerging, but is currently still at a low level. Recently, there have been different types of proposals to incorporate municipal water utilities or merge them with energy utilities, but yet very few of these proposals have been materialised.

Finnish water utilities are on average very small. The smallest municipalities and their water utilities are not doing well in economic terms. This is one of the reasons why regional cooperation between municipalities and their water utilities is increasing. Municipalities look for increased cooperation in providing water services, and also some regional water and sanitation companies – owned by several municipalities – have been established recently.

The Finnish legislation on water services was renewed in 2000/2001. The new legislation treats both public and private water service providers equally. There is not yet, however, any detailed economic regulatory system in place. It is expected that in a few years time an economic regulatory agency – most likely similar as has already been established for the energy market – will be established for the water services sector.

The role of private sector in WSS in Finland has a long tradition and is extensive in the form of outsourcing goods and services. Different scenarios (S1-S4) have been developed to envisage the long-term future development of the WSS sector and the role of private sector in Finland. Two of these scenarios (S1 and S2) are still based on the assumption that municipalities continue having the main responsibility for owning and running WSS services in Finland, although private companies still have an important role as producers of goods and services. The third scenario (S3) is based on a wide diversity of management arrangements and flexibility in institutional framework. Municipalities continue being the key players, but also private operators and in some cases private owners of urban water utilities will get increasingly involved in WSS services. The fourth scenario (S4) is based on a strong market approach, assuming that private companies will become in many areas the main service producers of WSS services. Efficiency and profit gains also result in various arrangements to incorporate municipal water utilities, often involving even questionable arrangements to evade taxes.

Strategically, in the long run, the most successful and promising policy and institutional arrangements for the Finnish WSS sector could be found among the most diverse and flexible options. Thus, scenario S3 looks as the most encouraging way forward for Finland and could be adopted also by many other countries.

Abbreviations

c/m^3	coulomb per m^3
cap	population
cap/km^2	population per km^2
EUR	Euro
EUR/m	Euros per meter
EUR/m^3	Euros per m^3
FIM	Finnish Markka (until 2001)
g/m^3	gram per m^3
km^2	square kilometer
kWh/m^3	kilowatts per m^3
m^3	cubic meter
m/customer	meters per customer
m^3/d	m^3 per day
m^3/a	m^3 per annum
Mm^3/a	million m^3 per annum
l/cap,d	liters per capita per day
BOD7	Biological Oxygen Demand, 7 days
tn/a	tonnes per annum
kg/kWh	kilograms per kilowatt
P kg/Fe tn	Phosphorus kilograms per iron tonne
ROI	return on investment
UFW	unaccounted-for water

Acronyms

CADWAS	Capacity Development in Water Services
EC	European Commission
EU	European Union
EUR	Euro
FEI	Finnish Environment Institute
FIM	Finnish Markka (until 2001)
FIWA	Finnish Water and Waste Water Works Association
IEEB	Institute of Environmental Engineering and Biotechnology
KTV	Kunnalliset työntekijät ja viranhaltijat (KTV Trade Union)
MAF	Ministry of Agriculture and Forestry
MDGs	Millennium Development Goals
MOE	Ministry of the Environment
MOSAH	Ministry of Social Affairs and Health
MTI	Ministry of Trade and Industry
PPC	Public-private cooperation
PPP	Public-private partnership
PSP	Private sector participation
SWOT	Strengths – Weaknesses – Opportunities – Threats
Tekes	National Technology Agency (Teknologian kehittämiskeskus)
TUT	Tampere University of Technology
UNESCO	United Nations Educational, Scientific and Cultural Organization
WSS	Water supply and sanitation

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ARTICLE 2

The experience of Greece

Giorgos Kallis[1] - Autonomous University of Barcelona (UAB), Spain

Harry Coccossis - Department of Planning and Regional Development, University of Thessaly, Greece

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Abstract

The article presents a synthesis of research results from the study of the part-privatization of Athens' water and sanitation services in 1999. It discusses the broad context that characterizes the provision of these services in the country, which until the 1990s had been almost entirely in the public sector. The paper provides a detailed account of the privatization reforms introduced in the country and examines the pros and cons of these policies drawing lessons from the Athens' case. It argues that national and international socio-political and ideological factors have been the main drivers of these pro-privatization policy changes, and will likely remain key factors in the future development of the water and sanitation sector in the country. Also, the analysis of main findings shows that, despite the rhetoric about the improvements that privatization would bring, the public sector remains central in the delivery of these services. Therefore, the article concludes that private sector involvement is no substitute for the much-needed modernisation and strengthening of the public sector. There is a need for structural policy and legal reform to enhance the public sector's capacity to deliver quality water and sanitation services run according to the principles of social and environmental sustainability.

Keywords: Privatization; water and sanitation services; regulation; financing; public sector reform; Athens; Greece

1 Contact author: Giorgos Kallis. E-mail: giorgoskallis@gmail.com

Resumen

El artículo presenta una síntesis de resultados de investigación del estudio de la privatización parcial de los servicios de agua y saneamiento de la ciudad de Atenas en 1999. Discute el amplio contexto que caracteriza la provisión de estos servicios en el país, que hasta la década de 1990 habían sido estado casi enteramente a cargo del sector público. El trabajo provee información detallada de las reformas privatizadoras que se introdujeron en el país y examina los puntos en contra y a favor de estas políticas públicas sobre la base de las lecciones aprendidas de la experiencia de Atenas. Argumenta que los factores socio-políticos e ideológicos, tanto a nivel nacional como internacional, fueron decisivos en la introducción de estos cambios en las políticas públicas a favor de la privatización y que muy probablemente seguirán siendo factores decisivos en el desarrollo futuro del sector de los servicios de agua y saneamiento en el país. También, el análisis de los hallazgos de investigación más importantes demuestra que, a pesar de la retórica acerca de los beneficios que traería la privatización, el sector público continuó teniendo un papel central en la provisión de estos servicios. Por lo tanto, el artículo concluye que la participación del sector privado no es un substituto de la necesaria modernización y fortalecimiento del sector público. Es necesario introducir reformas estructurales en las políticas públicas y en el marco legal para mejorar la capacidad del sector público para proveer servicios de agua y saneamiento de calidad, que sean gestionados de acuerdo a los principios de la sustentabilidad social y ambiental

Palabras clave: privatización; servicios de agua y saneamiento; regulación; financiamiento; reforma del sector público; Atenas; Grecia

Introduction

This paper presents a synthesis of the PRINWASS Project's Greek case study. Its main goals are to:

- identify the structural continuities and emerging trends regarding private sector involvement (PI) in Water and Sanitation Services (WSS) in Greece and more specifically in Athens, where such developments have taken place.
- produce expert knowledge and information and assess the implications of the recent shifts towards more private involvement in WSS in Athens.

Metropolitan Athens is the city where 40% of Greece's population lives. It is the industrial and services' centre of the country. Athens is located in a semi-arid region with limited local resources. The growth of the city and the urbanisation of Athens' basin have been accompanied by a series of water resource works which have reached rivers, as far as 250 km away from the city. Water resource management has been central in the development and urbanisation process of the city.

Until recently, Athens' water management was solely a state affair. The government has a tight control of water resources' allocation and is responsible for the planning and execution of all water works. Athens' water company (EYDAP), responsible for the provision of water and sewerage services in Athens' ("Attica") region, was since 1980 a Ltd enterprise, all shares owned by the State. The Government appointed the President and General Manager of the Company and had control over all key decisions (such as pricing, network extension to new areas, execution and financing of new works). In 1999, EYDAP was partially privatised. The Government made available 39% of the company's shares to private investors through Athens' stock exchange market. Plans are to gradually increase the participation of the private sector during the following years (up to 49% shareholding in a first phase, and potentially to a majority in a second phase). This model of dispersed private participation through a so-called "equitisation" has been implemented in other public utilities. Recently it was also implemented for Thessaloniki's (the second largest city in Greece) municipal water utility. There are indications of government's plans to promote similar schemes for other municipal water utilities too.

According to government and EYDAP officials, this shift towards private participation has led to a "modernisation" of the company, an amelioration of its customer services and an improvement of its financial and economic situation. It also contributes to a more "rational" management of water resources and an improvement of the company's environmental performance (Xenos, Dedousis, et. al., 2001; Xenos, Xanthakis, et. al., 2001). The present study examines and assesses independently these claims with empirical data, for the first time since the partial privatisation of EYDAP in 1999.

The theoretical approach adopted relates to the problem-oriented, spiraling methodology of PRINWASS research. In contrast to standard, neo-classical economic analyses, "privatisation" is not considered as a universal model or a common set of principles, which by definition leads to more "efficiency". The framework adopted relates to – "heterodox" – institutional economic approaches, which view "privatisation" primarily

as a change in the set-up of institutions (Bromley, 1989, 1990, 1991, Livingston, 1993, 1995, Swaney, 1988, 1992), or a "re-regulation" (Bakker, 1999), with different implications for different dimensions/criteria and social actors/ groups. There is not a universal model of privatisation, but different institutional arrangements, with different mixes of public, private and community control. Nor is there a universal efficiency criterion, but multiple criteria with multiple levels of importance for different social actors (Kallis, 2003).

The objectives of this research are to:

1. trace the causal factors behind the partial privatisation of EYDAP and analyse in detail the new institutional arrangements accompanying it,
2. identify the new incentives and disincentives that the new institutional framework sets and hypothesise on its effects,
3. relate hypotheses with empirical results and trends in the 1999-2003 period,
4. relate claims and counterclaims before privatisation with the actual empirical results.

In turn, this analysis will feed back into the policy process by identifying the key issues and conditions for a successful "re-organisation" of Athens' water services.

Athens' case study is important in the context of PRINWASS comparative research approach, for the following reasons:

1. In terms of socio-economic and political characteristics, Athens stands "in-between" the developed cases of Northern Europe (England, Finland) and those of Latin America. According to Leontidou (1989), Greece's urbanisation pattern, characterised by a rapid rural-urban migration and an over-population of the country's capital, and its social and economic roots, bear much more similarity to those of cities in Latin America than those of Western Europe. The centralised, "clientelistic" administrative system of Greece, and the - relatively to other European countries - recent democratisation of the political system (1974) is also similar to the Latin American cases. On the other hand, being part of the European Union, Greece' economy and political organisation has in many ways converged with the rest of Europe. In addition, the high degree of social homogeneity and the low (though increasing) income disparities, differentiate Athens from most Latin American and many European cities (Leontidou, 1997).
2. The new regime of Athens' water utility is unique. It is the result of a compromise from a government elected with an "anti-privatisation" agenda (after popular demands against the attempts for full privatisation of public utilities) but trying also to satisfy the criteria of convergence of the Greek economic model with the rest of Europe. The State retains the majority of the company's ownership and changes are comparatively modest. In Greece, this model has been coined also as "popular privatisation", as the majority of the shares are distributed to small, individual shareholders through a broad distribution in the stock-exchange market. Comparing the advantages and disadvantages of this "half-way" privatisation model and positioning it with respect to the rest of the PRINWASS cases will help

in developing a more complete picture of private participation cases and results around the world.

Sources of information include: factual statistics (annual water supply and service data, Hellenic bureau of statistics ten-year reports on demographic data, Ministry of Environment annual reports for environmental quality data); government and water company studies and reports (e.g. for specific projects, Athens' water supply master plan, report for the introduction of the company in the stock-exchange market, government reports on urban water services, etc); water company publications (monthly magazine, etc); media reports and newspaper articles; government reports accompanying regulatory reforms; and, proceedings of the discussions in the Hellenic parliament over relevant laws or parliamentarian's questions. Qualitative, semi-structured interviews were also carried out with water company and government officials and personnel, NGO representatives, consultants and engineers.

The structure of the study reflects the key dimensions and topics addressed in all PRINWASS' cases. Part A describes the characteristics of the case of Athens, and Part B assesses the results of the new regime. Finally, Part C presents a synthesis of findings and potential future trends, drawing key policy conclusions of broader relevance based on the evidence provided and the assessment of scenarios.

In Part A, the first section presents the key demographic, socio-economic and spatial characteristics of the city. The second section describes its water resources and their river basins as well as the water distribution, use and sewerage/treatment systems. In the third section, the key trends and issues in the development of the system are identified as a reference for the discussion that follows. The fourth section examines the institutional (regulatory plus governance) system of Athens' water resources. First, the water services legal framework pro-privatisation is presented. This is followed by a presentation of the political process that led to private participation, highlighting the main claims and counterclaims. Then, the key characteristics and changes of the new regime are outlined. The legal frameworks for water resource management, environmental and public health protection are also presented. The chapter concludes with a recap on the governance system of Athens' water services.

In Part B, the first section assesses whether the new regime is delivering what it promised in terms of improvements in the financing and the economic performance and effectiveness of EYDAP. First, the financial arrangements for the new, privatised EYDAP are presented. Then the changes in the financing capacity and sources and the progress with the investment programme of the company is assessed. Changes in pricing are also presented. This is followed by an appraisal of the economic relationships first, between EYDAP and the State and second, between EYDAP and Local Authorities (both were highly problematic in the past). The second section looks into changes in the operation of EYDAP as a utility. The claims that the partial privatisation of EYDAP will lead to business modernisation, more accountability to the public, improvement of productivity due to independence from the state, a more efficient personnel policy and better service performance, are examined. The third section investigates the social implications of recent policy changes. First, equity concerns related to the potential subsidisation of a partially private company from the public purse are discussed. Then, it is examined whether the partial privatisation of EYDAP has led to a more open

administrative structure and a "democratisation" of decisions. Third, the potential social impacts from privatisation-related price changes are discussed. Finally, the impacts in terms of connecting previously locally-serviced municipalities to the central water and sewerage networks are examined together with the issue of the uneven relationship between Athens and the periphery from where it draws its water resources. The fourth section focuses on the implications of the new regime in terms of water resource management and environmental protection. The incentives set by the new regulatory regime which passes the ownership and responsibility of resource assets to the State constraining EYDAP to network services are discussed. The hypothesis that these will sustain a pattern of growth in water demand and pressure for new resource development is formulated and tested with respect to empirical data on recent patterns in water consumption and management.

Part C outlines the findings from the research of the outcomes of PI in WSS in the capital of Greece, Athens and based on those develops alternative policy scenarios about PI and its impacts in Greece. Appraisal of the strong and weak points of each scenario leads to the identification of policy recommendations for the future development of WSS in Greece, and the role of PI on those. The first section presents briefly the current state of PI in Greece and examines the key lessons from the investigation of Athens' case study. Emphasis is on the three key dimensions of PRINWASS (socio-political, economic and institutional) and the test of the key claim, i.e. whether PI leads to improvements in WSS performance or not. The second section structures four alternative PI policy scenarios and examines their impacts for the reference year 2015 (although Millennium Goals are not relevant for Greece, 2015 has been taken as the reference year for comparative purposes with Latin American and African cases). Scenarios include a "business as usual" trend scenario with no big changes, a "public sector predominance" scenario, a "private sector predominance" scenario and a "diversified and balanced" scenario. The main characteristics of each scenario in terms of private and public sector division of responsibilities are provided. Then each scenario is assessed separately. The likelihood of each scenario and the drivers that could lead to its realisation are first discussed. The strengths and weaknesses of each scenario are then examined with reference to the key PRINWASS dimensions. This is followed by an analysis of opportunities and threats, i.e. factors than can contribute to the success or failure of each PI scenario. The final section draws some key policy conclusions of broader relevance based on the evidence provided and the assessment of scenarios.

The report closes with the Conclusions, where an overall appraisal of the positive and negative elements of the recent partial privatisation of Athens' water utility is performed. The key policy issues with respect to the dominant trends are raised and some suggestions are put forward. The key message is that PI is no substitute for sound financing, pricing, regulation and participation policies for the WSS sector.

Part A – The Case of Athens

The Urban Area of Athens: Demographic and Socio-Economic Characteristics

Geography

Athens is situated in the region of Attica, in the central-southern part of Greece (see Map No 1), a peninsula connected with the mainland by two mountainous formations: Kithairon and Parnitha. The Athens basin occupies the Northeast part of the peninsula and is surrounded by a natural, mountainous crown consisting of four mountains with an average height of a thousand meters. The total land area of the department of Attica (including the "urban islands" of Aegina and Salamis) is estimated at 322 ha out of which 147.6 ha (46%) are considered suitable for urban development (Coccossis and Schubert, 1989).

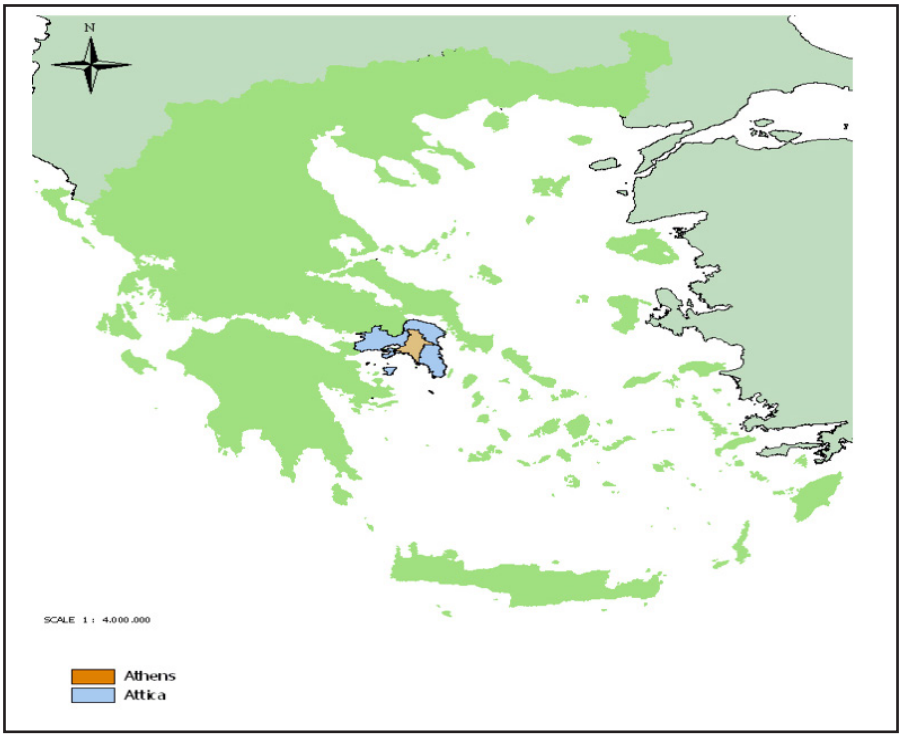
Athens has a typical Mediterranean climate. The mean temperature is 18.50C and the mean total precipitation 368 mm. Rainfall is almost non-existent in Summer months. Humidity is 50% in July and the average maximum temperature is 310C in August. Rainfalls are characterized by high intensity and short duration creating favourable conditions for flood events, which are exacerbated dramatically in the last years by rapid urbanisation and blockage of natural local streams. Athens is located in a semi-arid basin, and the availability of local natural water resources in the area, with the exception of a few mountainous streams and aquifers, is negligible.

The urban area of Athens is part of the wider Attica region (Map No 2). The two major "poles" of the city are Athens centre (historic and present day centre around Acropolis) and to the south, the port of Piraeus. To the east of this axis is the coast of Athens, with relatively affluent suburbs around the old airport ("Ellinikon") and urbanising secondary-turn-fist housing to the north. In the north-east part of Attica the semi-rural but fast urbanising Messoghia plain is located with the new airport at "Spata". The northern part of Attica is rural; agricultural production is centred around the area of Marathon. To the north-west, low-income suburbs are located ("Ano Liosia"), and further to the west and beyond the basin is the Thriassion plain, where most of the heavy industry has been concentrated along the coast together with some agricultural production in the hinterland (around "Aspropyrgos"). To the north of the city's centre and along both sides of the axis to the northern suburb of "Kifissia", the city's middle and high class suburbs have developed. Map No 2 illustrates this general orientation of the city and divides the region of Attica geographically into four groups: Athens basin, north Attica, East Attica, West Attica and the islands.

Administratively, Athens belongs to the prefecture of Attica. The prefecture is sub-divided into two major groups: "Athens-capital" and "Rest of Attica". Athens-capital includes the larger part of the municipalities within the Athens basin and is divided into two sub-sectors: the Athens and the Pireaus sector. The "Rest of Attica" includes

all the municipalities of the prefecture of Attica beyond Athens-capital. During the last decades, and as the city "spilled over" the basin and a practical continuum of the city extended to cover gradually the Attica region, we can talk of a "metropolitan area" of influence of Athens. This is a conceptual but not an administrative or geographical division. Therefore we can approximate the wider Athens metropolitan area to the prefecture/region of Attica, though some parts in the north and west of Attica and the islands to the south, accounting for only about 1% of total population, are not urbanised.

Map No 1; Athens, Attica and Greece

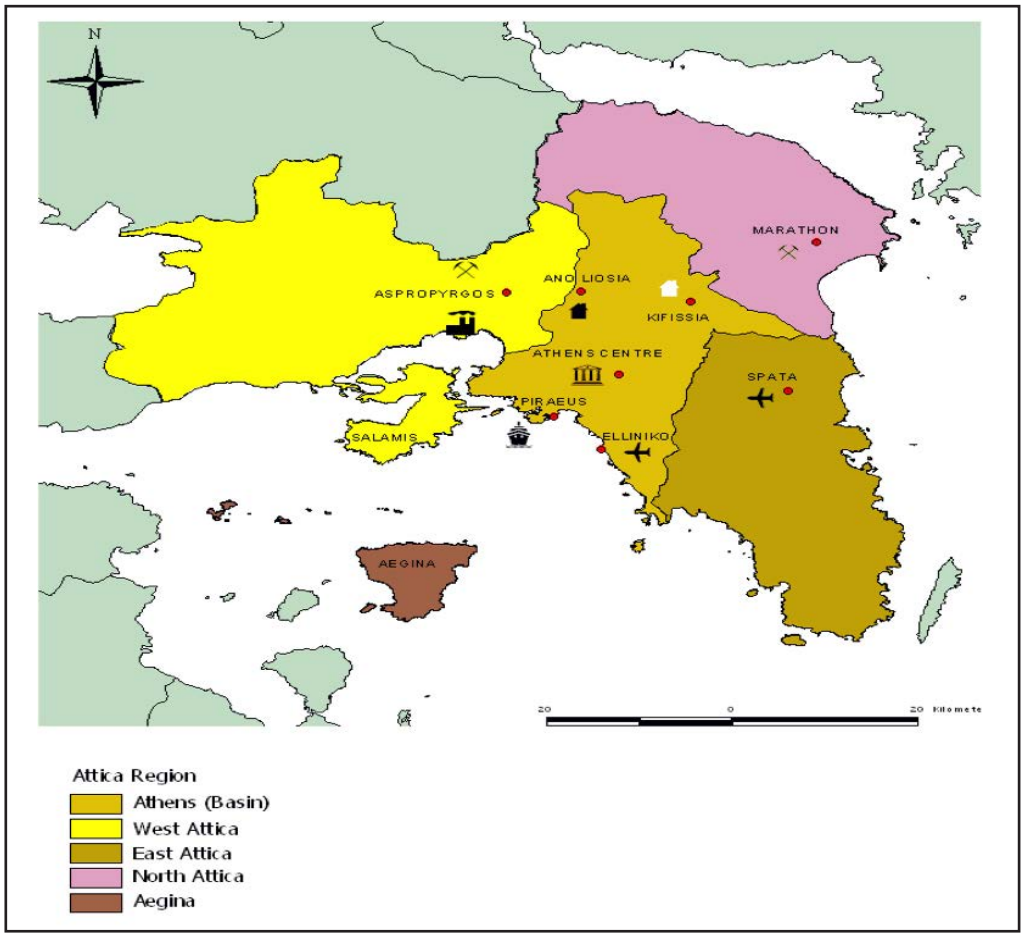


History of Athens' urbanisation

For most of the 19th century, Athens was a small settlement with practically no industry, living by its administrative function as the capital of liberated Greece (Burgel, 1981). Its fortunes shifted at the turn of the century with the gradual migration to Athens of the wealthy Greeks of the diaspora (from Europe and urban centres in the retreating Ottoman empire), bringing with them their funds and industrial knowledge and linking Athens to international capital, which was repositioning its investments to peripheral regions (Leontidou, 1987). The major national infrastructure (roads, port, etc.) was designed with Athens at its centre. The city's history was punctuated by the expulsion of the Greeks of Minor Asia in 1922 and the exchange of populations with Turkey. Many of the refugees concentrated in the capital resulting in the doubling of the city's population (see Chart No 1). Whole industries moved from Turkey's coast to

Athens, while the immigrants provided a numerous and skilled labour force (Coccossis and Schubert, 1991). A process of industrialisation took off, though industries remained – as till today – small-scale and oriented towards consumer goods and the local market (Burgel, 1981).

Map No 2.; Attica Region



The city's history was punctuated again at the end of the 2nd world war and the following Greek civil war and the exodus of the famine-struck rural population primarily to Athens and to western Europe. Faced with an acute housing problem, a lack of public funds for social housing, the lock-out of domestic savings from the market and limited industrial opportunities, the state allowed, if not facilitated with its loans policy, the emergence of a peculiar construction-based economy (Vaiou et al, 1995). First, "illegal" self-built housing (i.e. in areas not committed to housing in the urban plans, which were thus cheaper to develop) was tolerated by the state and legalized ex-post as a response to popular demands. This was paralleled by an internationally unique institutional system of pre-selling and exchange arrangements between small land owners and developers ("antiparochi"), which allowed the erection of multi-storey apartments at a low cost, with almost no need for start-up funds (Vaiou et al, 1995). As domestic savings were channelled

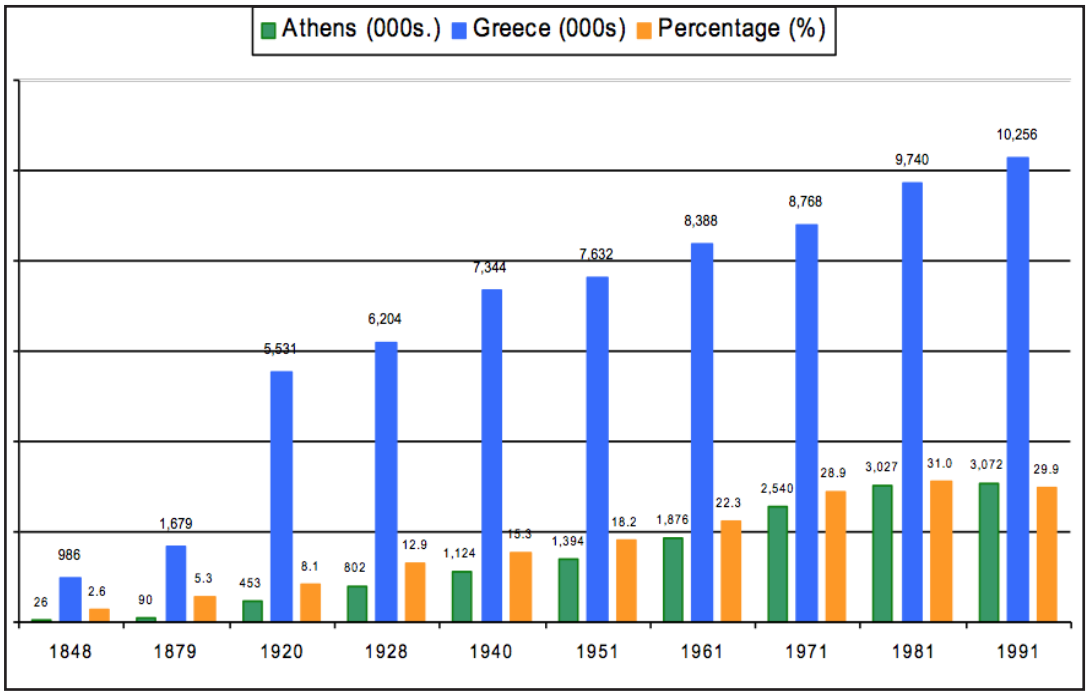
to Athens' housing market and rural population and funds attracted to the capital, a self-perpetuating, construction-based growth, with increasing job opportunities and the flourishing of construction-supporting, manufacturing industries. Athens in the 1960s was the site of the Greek "economic miracle" with rising productivity in the context of fast urbanisation (Leontidou, 1997). The urbanisation of Athens provided a means for creating wealth with limited demands from the State. It allowed the lower classes both to house themselves and to prosper from the booming housing market, alleviating the intense social tension of the immediate post-war era (Burgel, 1981, Leontidou, 1987).

Demographic and socio-economic characteristics and trends

Demography and urbanisation

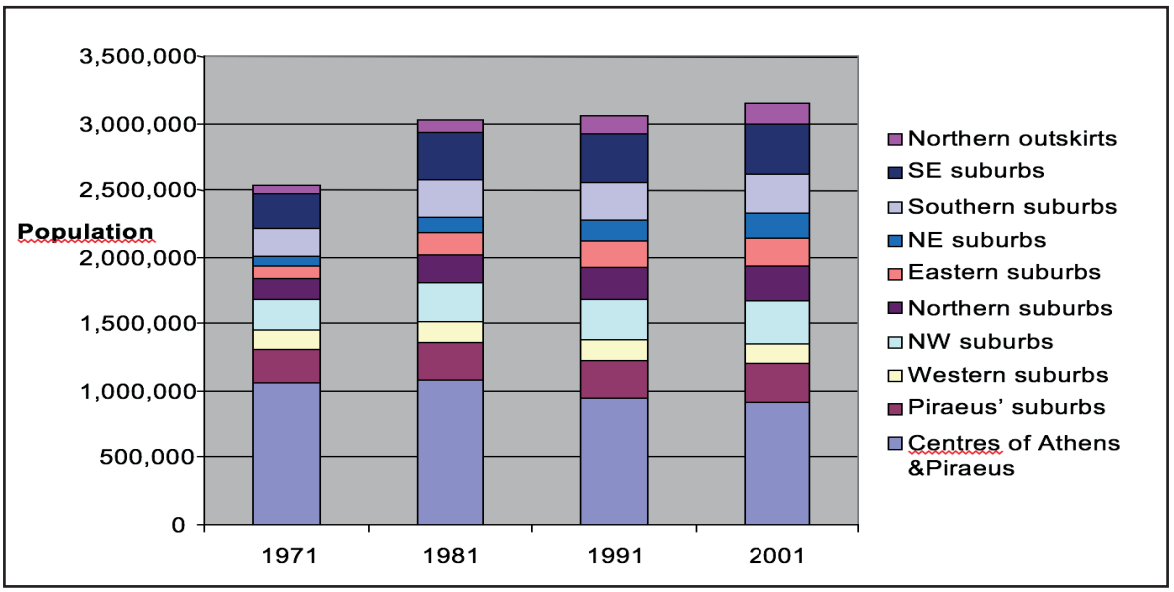
Chart No 1 shows the evolution of Athens' population. The recent trend of stabilisation of the city's population is followed by a relative increase of population in the suburbs of Athens-capital and of intensifying urbanisation of the Messoghia plain and the coastal region of Attica. Chart No 2a,b illustrates this process whereby the population of Athens' centre is decreasing but the population in the suburbs and the rest of Attica is increasing. Population also in the peripheral to Athens cities and summer visitors to the islands of Argosaronikos are also increasing.

Chart No 1: Growth of Athens population



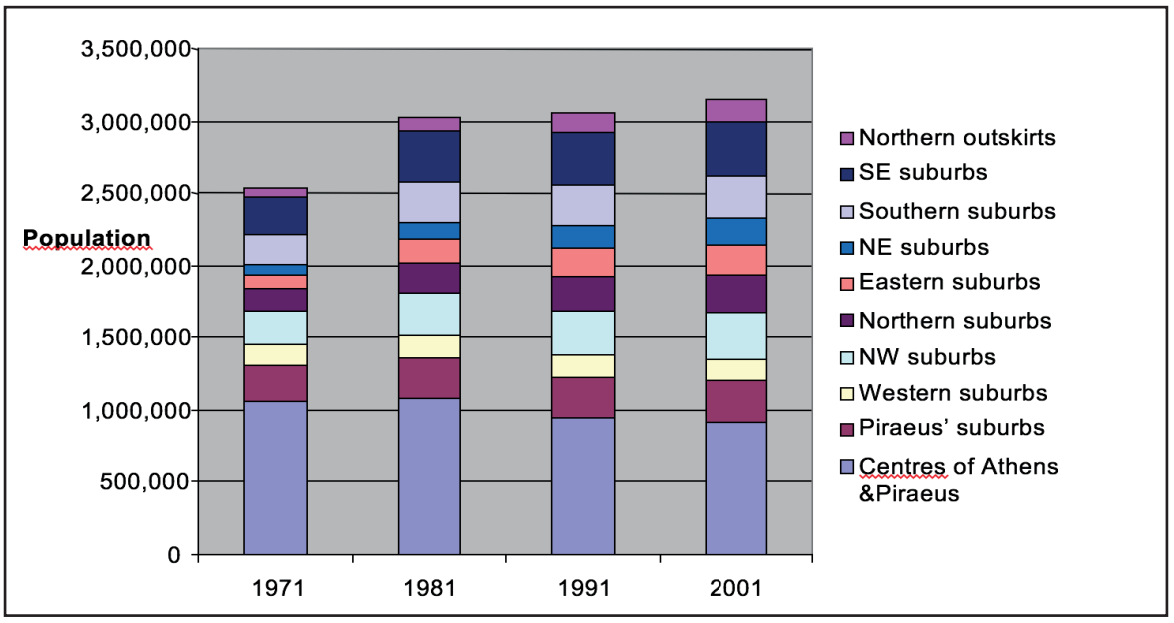
Source: National Censuses.

Chart 2a: Population in different groups of Athens' municipalities



Source: National Censuses.

Chart 2b Population in different groups of Athens' municipalities



Source: National Censuses.

The average household size is decreasing from 2.93 persons/household in 1981 to 2.78 in 1991 (ESYE, 1981, 1991), leading to an increased land-ownership fragmentation and further extension of the urban fabric. One-person households are increasing, especially in the inner city, where the population is rapidly ageing. This trend is expected

to continue in the future and provide a driving force for the city's expansion.

A main trend is this of a decreasing natural rate of population growth (i.e. births vs. deaths). The average annual rate of natural increase in the 1981-87 period was 0.6% (for the whole of Greece, Germanopoulos, 1990), which lately has been reported to fall to 0.3% (Leontidou, 1997). This is accompanied by a related ageing of the population (see Table No 1 for Athens).

Table No 1. Age distribution for Athens spatial agglomeration:

Year	Age group (as % of total)			
	1-14	15-39	40-64	>65
1981	22.1	37.3	29.7	10.7
1991	18.1	37.8	31.0	12.8

Source: ESYE, 1991.

An unknown but possibly crucial factor, which can lead to the underestimation of the dynamics of the population and demographic size of the city, is the number of unregistered economic immigrants. In the prefecture of Attika, according to data from the Organisation for Employment, 194,000 foreigners had submitted (until 1998) their papers for a resident's permission. This number is estimated to be 50 to 70% of the real number of foreigners in the city. A large number of the newcomers resides in neighbourhood clusters in the centre of Athens, in houses rented by locals who moved to the periphery. Another substantial part finds residence in the outskirts of the city and is mainly occupied in construction or agricultural activities (Leontidou, 1997).

Economy and income distribution

A process of de-industrialisation in the last two decades has been accompanied by a growth of the service sector, especially banking and public service-related. As an indication, employment in banks and insurance in the wider metropolitan area grew by an annual rate of 2.29% in the period 1978-1988. Similarly employment in other services grew annually on average by 3.29%. In comparison, employment in the manufacturing industry has been falling by 1.31% per year (1% for the whole of Attica) (Attico Metro, 1998). The end of the 1970s and beginnings of the 1980s were characterised by an important expansion of employment in the administration and the public sector, the ratio of state employees to productive workers in Athens reaching a 1:1 ratio in 1983 (Leontidou, 1997). This trend has slight been reversed since then.

Table No 2 indicates the division of production and employment between economic sectors. It is clear that in the 1980s the service sector grew comparatively more, without however the other sectors contracting. This was an era when the de-industrialisation process gradually stabilised; agricultural production is small and relatively still grows.

Table No 2: Economic activity per sector

Sector	% of Regional GDP (1991)	GDP growth (1981-91)	% of Regional Employment	
			1991	1981
Primary	2.1	21.6	1.6	1.8
Secondary	26.5	10.3	27.8	38.2
Tertiary	71.4	26.3	70.6	60.0

Source: ESYE, 1991.

Table No 3 gives more detailed data on the various economic activities in the Attica region. The table highlights that Athens has a dominant role in Greek economy. With the exception of agriculture and mining, Athens is still the centre of economic activity of the country, especially with respect to the tertiary sector and accounts for a higher proportion in employed population than its share to total national population. Utilities contribution to sectoral GNP is higher than the proportion of Attica's population, indicating a higher economic activity and investment than justified by a mere scale effect. Tourism in the basin has been declining the last decades (a decline of 18.9% in the number of foreign tourists/nights for the period 1981-91). The causes for this are often referred to the concentration of the main hotel units at the polluted and congested centre of the city and the introduction of new charter flights that by-pass Athens to reach other destinations in Greece.

Table No 3: Economic production in the Attica región

Sector	GDP, 1996 (in Billion 1994 drachmas and as % of total)	% Contribution to sector's GNP		% Contribution to National Employment in the sector
		1994	1981	1996
Primary sector	109 (1.8%)	5.4	3.9	2.5
Mining, quarrying	3 (0.0005%)	1.6	4.3	9.5
Manufacturing industry	1,000 (17.3%)	41.8	40.6	38.9
Electricity, gas, water	169 (2.9%)	41.9	29.2	42.9
Construction	273 (4.7%)	27.5	27.0	31.8
Commerce, Restaurants, Hotels	963 (16.6%)	44.9	44.5	52.3
Transport, Warehouses, Communications	578 (10%)	51.1	52.4	55.4
Banks, insurance	258 (4.4%)	54.1	66.7	72.1
Services	2,425 (41.9%)	37.1	45.7	62.9
Public Administration – National Security	-	41.9	41.9	45
Health – education	-	42.4	46.2	48
Total	**5,779 (100%)**	**36.5**	**35.5**	**42.1**

Source: Attica Metro report, 1997; ESYE, 1991 &1981 census data.

The Greek economy as a whole continues to grow and Athens, its driving force, shapes this trend. GNP in the period 1981-1991 grew by 20.1% and in the region of Attica by 21.6% (IKEPE, 1996). Scenarios for the future consider an average annual GDP growth in the region at about 2.5-3.5% (Attico Metro, 1998).

Athens scores exceptionally well in almost all "social"/"equity" indicators and consists of a spatially homogenised society (Leontidou, 1997). It is one of the capital cities with the least crime rates in Europe and a very low income disparity. Spatially, there is no sharp class segregation in Athens as reported in many Western metropolis. Whereas in the pre-war and first post-war decades Athens' neighbourhoods developed as spatially desegregated regional clusters of defined socio-economic characteristics, the situation gradually changed as the city grew. The general income depolarisation (enhanced by the informal economy) and the creation of a middle class, as well as the inheritance of family residences as working-class parents passed their property to middle-class descendants, combined with rigidities in the housing market (due to high transaction taxes), "dissolved" this pre and post-war class polarisation. Moreover, state policies in the dictatorship period (1968-74) aimed at dispersing working class neighbourhood enclaves. Coupled with the increasing construction of multi-storey apartment blocks, these led gradually to a "vertical" (i.e. within buildings), instead of a "horizontal", neighbourhood differentiation (Leontidou, 1997). Homelessness, in a northern European sense, is absent largely due to self-built housing and the important role of family in the wider distribution of wealth, owner-occupation and unemployment relief. Social cohesion is partly the result of important informal relationships, such as family support and income sharing to unemployed youngsters, which on the other hand creates a dis-incentive for employment, and partly a side effect of the sizeable informal economy. Irregular work, secondary jobs, part-time contracts and un-registered jobs form part of this wider informal socio-economic environment, which makes hard the accurate depiction by statistics of the real situation in employment and level of income (Leontidou, 1997).

The first half of the 1980s has been an era of closing income disparities. The ratio of highest to lowest salary dropped from 4.2 in 1980 to 2.3 in 1988; in the same period real wages for high-income labour fell by 55% while they increased by 20% for low-wage employees. This however, may have partly provided a disincentive for economic productivity or inversely, may have been the cause of the lack of industrial incentive for technological and managerial innovation (Leontidou, 1997).

Following the end of this period and the relative de-industrialisation of the city, unemployment started growing (Table No 4) This follows the wider European trend of economic restructuring and is related to the quest of Greece to enter the European Monetary Union (EMU) and to control the expansion of the public sector which absorbed a great portion of employment needs in the past decade. In Athens, the socio-spatial homogenisation of the city may is changing as nuclei of poverty and homelessness are created in the inner and northern parts of the city by illegal, underpaid immigrants in short-term jobs. Given the rising unemployment of local population, it seems that the long-term stability of the city's remarkable social equality and homogenisation may be at stake.

Table No 4: Employment in the Athens metropolitan área[2]

Year	Total employment	Unemployment (%)
1971	830,584	4.3
1981	985,828	1.9
1991	1,231,436	8.6
1996	1,504,321	-

Source: ESYE, 1991 census data; adapted from Demathas and Tsilenis, 1985; 1996 data from Attico Metro Report, 1998.

The economic future of the city will be determined in an increasingly globalised and competitive international landscape. Athens lies outside the traditional European development and transport corridors, and in a more general sense it is not part of the major European and global networks. The typical industry in Athens has been traditional and non high-tech and the city is characterised by small scale, labour-intensive industrial units and a large informal sector (Leontidou, 1997). The service sector is still domestic market oriented. More importantly, a complex set of institutional, economic and social factors puts major barriers to real innovation as reflected in R&D activities. On the other hand, Athens is positioned at a strategically important geo-political location, with the Balkans providing a potential economic hinterland. Greek enterprises are developing in the Balkan regions and services and utilities (including electricity, telecommunications and more recently, water) are central sectors in this penetration. Privatisation of state enterprises in order to reduce public deficit and inflation-control policies shape the contemporary economic environment in the city. The banking and investment sectors grew on the expectation of entrance in the EMU but are facing a recession since, related to similar trends at an international level.

Piecemeal development and spontaneous/speculative behaviour have predominated the economic attitudes of the capital's population since its first years and in a way drove the construction and economic development of the post-war era (Leontidou, 1997). This was once again the case, with the "speculative ethos" as high as ever, a three-fold increase of the stock exchange market in 1998-99 followed its "collapse" after.

The city's economy continues to grow at high rates (2-3%) unlike the typical developed and stabilised western economies. A new series of structural investments take place in the city as part of the allocation of European structural and cohesion funds and the quest for economic growth. The organisation of the 2004 Olympic games provides an opportunity to "redevelop" the city and enhance its economy. The new airport in Messoghia plain, the previous agricultural heart of Attica and one of the few undeveloped

2 Data for 1971 and 1981 refer to the Athens agglomeration; data for 1991 and 1996 to the Attica region; numbers come from different sources and given the inaccuracy of estimations one should consider them only to the extend of demonstrating the general trend.

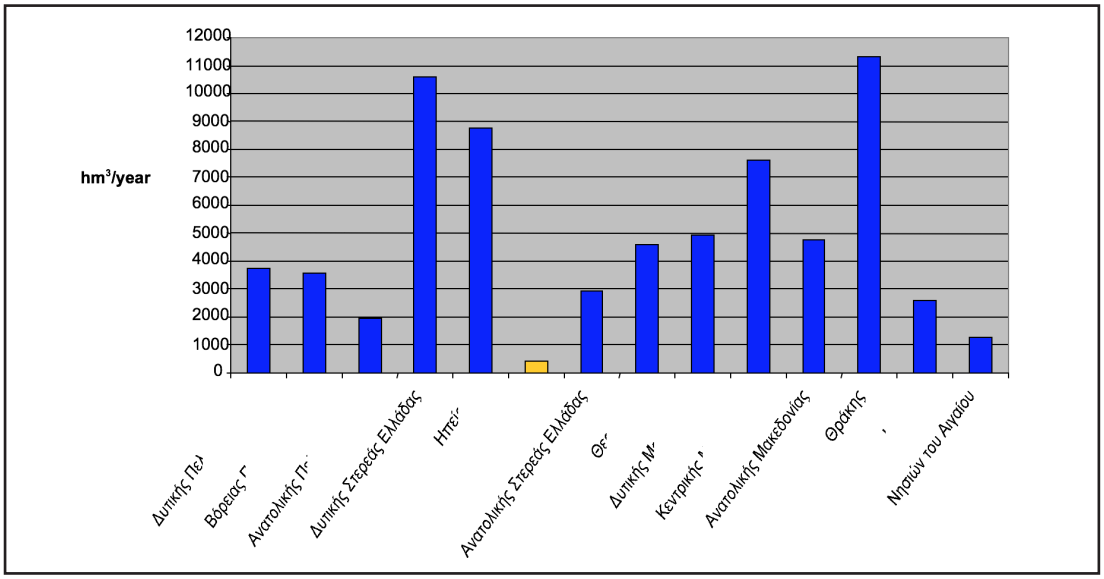
areas in proximity to the metropolitan area. A number of other road and facilities construction works are also planned as part of the organisation of the Olympic games.

The Urban Water System

The local water basin

Greece is divided into fourteen regional water districts. The water district of Attica includes almost the entire Attica region where metropolitan Athens is a part of, and a small part of the Korinthia and Viotia regions (YBET, 1988). The water district of Attica (in yellow in Chart No 3) is the most arid of all the fourteen districts in the country. Most recent calculations estimate the total surface drainage within the Attica region to be 251 hm^3 per year and the potential hydrogeological reserves to be 277-297 hm^3 (YPAN, 1996). Underground water resources are contaminated, with the concentration of nitric derivatives to surpass by far the EU maximum level for drinking water supply (EKPA, 1994). The carstic hydrogeological units have an open face to the see and as a result many of the underground waters are salinated (YPAN, 1996). The only carstic units potentially available for water supply are situated on the mountainous area (Penteli, northeast Parnitha). Within the district there are three hydrographic basins (Attikos, Kifisos, Sarantapotamos and Xaradros). Kifisos and Ilisos the two known 'ancient' rivers of Attikos Kifisos, do not exist any more since they have been completely covered by built areas. Xaradros, which springs from the eastern end of Parnitha caters the first water reservoir of the city, that of Marathon, with approximately 7-10 hm^3 per year (Koutsogianis et al, 1990).

Chart No 3: Available water resources for the fourteen water districts in Greece



Source: Ministry of Development 1987.

The Gulf of Saronikos

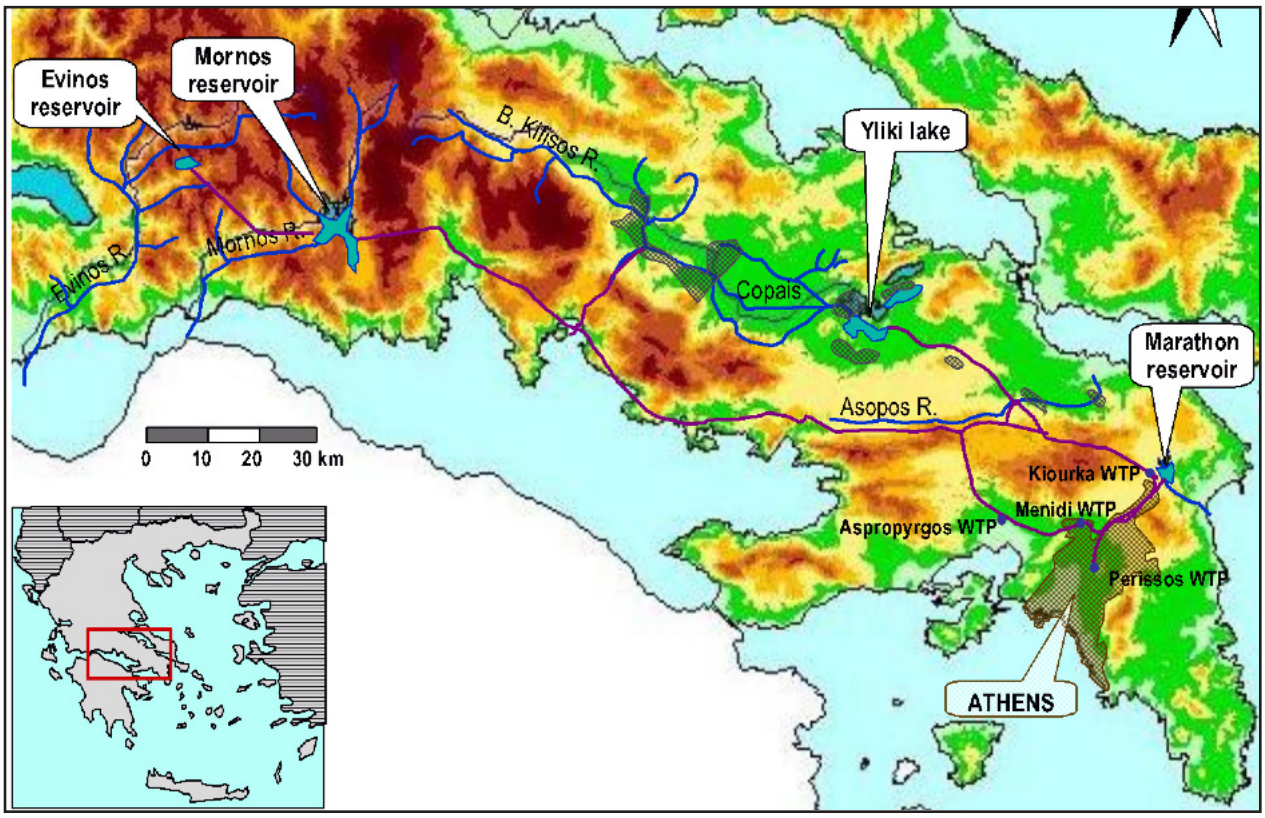
The Gulf of Saronikos is a semi-enclosed sea, which is surrounded from the north and east by the coast of Sterea Ellada and to the west-southwest by the coast of Peloponisos. It has and area of 26,000 km^2 and it is connected with the Aegean through a narrow opening, of 50 km width in its northwest end, between Sounio and Poros. The region is divided into five sea masses: the gulf of Eleysina, the Internal Sronikos, the Central, West and External Saronikos.

The water quality of the Saronikos gulf with respect to nutrients is characterised by a wide range of trophic conditions. Apparently, apart from the special physical-geographic characteristics that contribute to the formulation of a negative environmental condition (semi-enclosed gulf), the disposal of wastes is an important polluting factor because it increases the concentration of amonic and phosphoric algae. Mean annual values of nutrients suggest that the areas of Eleysina, Psitalia and West Saronikos from 1993 to 1997 have developed the highest levels of nutrients. During the summer months a stratification of the water is observed and the diluted oxygen is seriously decreased in depths below 20m. A characteristic example is the area of Eytaksia (depth 33m), where during the summer in the seabed there is a very high concentration of ammonia (due to lack of oxygen). Eutrofism occurs especially in the western areas (Aspropirgos), where all the wastes of Athens end up and at the same time it is the area where many of the industrial activities of the city are concentrated (oil refineries, cement). More specifically in the area of Psitalia there are high levels of ammonic, nitric and phosphoric recorded, high levels of nitric and silicon in the west Saronikos and high levels of chlorophyll in the gulf of Eleysina, which is also characterised by the high concentration of silicon and phosphoric. The lowest nutrients value is found in "external" Saronikos (as expected), due to the mixing with the cleaner, oligotrophic waters of the Aegean Sea. On the other hand, the frequent refresh rate of the sea masses and its distance from human activities, are factors, which play an important role in preserving the low concentration of nutrient algae and chlorophyll in the internal Saronikos gulf. A general observation is the presence of concentrations of heavy metals in the gulf of Eleysina and in the area of Psitalia. In more detail, the north east coastal zone of the gulf of Eleysina suffers more due to the high density of industrial activities in the area. It is also worth mentioning that there are concentrations of heavy metals recorded in the external Saronikos in levels comparable to the rest of the areas although the stations are situated in great distance from dry land activities. A range of polyaromatic hydrocarbons have been detected in high concentrations in the waters of the Gulf.

The hydrosystem of Athens and the source river basins

Given the lack of local water resources, the water supply system of Athens has expanded to distant water basins (Map No 3), to the regional department / water district of "Western Sterea Ellada", the second most abundant in water resources (Chart No 3)

Map No 3; The Hydrosystem of Athens



Basic data for the major water sources of Athens are presented in Table No 5. Under normal circumstances the drinking supply of the city comes from the artificial reservoir in river Mornos, which is additionally supplied by a reservoir at the river Evinos (partial operation since 1995, full operation since 2002). The lake Iliki which was the main source of water supply for the city until the operation of Mornos, is only used circumstantially due to the high water conveyance cost since relating to the need for water pumping (Iliki is at a lower altitude than Athens). Lake Iliki, which gets 90% of its water from the river Biotikos Kifisos loses up to 50% of its inflows to underground seepage (Koutsogianis et al, 1990). Losses increase with water level since the higher beds were not part of the natural system of the lake (the water reached this level only after the diversion and drainage of the neighbouring lake Kopaida in the end of the 19th century). Most of the groundwater boreholes around lake Iliki, its aqueduct and river Biotikos Kifisos were constructed in emergency during a recent drought (1993) and remain stand-by in case the reserves of the city run out again. The lake of Marathonas, the first hydraulic project of the capital, due to its small size in relation to the current levels of consumption, serves basically only as a large service reservoir for the network.

Table No 5: Data for the water sources of Athens

Source	Year put in operation	Distance from Athens (km)	Size		Catchment Area (km^2)	Average run-off (hm^3/yr)	Safe yield (hm^3/yr)
			Surface (km^2)	Volume (hm^3)			
Mornos Reservoir	1981	192	18.5	780	585	235	380
Evinos Reservoir	2002	221	3.5	140	352	295	
Marathon Reservoir	1929	21	2.4	41	119	7-10	140
Lake Iliki	1957	85	24.5	600	422 2010	330	
			Nr of boreholes	**Drilling capacity (hm^3/yr)**		**Estimated aquifer annual recharge (hm^3/yr)**	**Available recharge for Athens' boreholes (hm^3/yr)**
Iliki boreholes	1992		45	85		30	20
Biotikos Kifissos Boreholes	1993	-	28	136		200 – 250	0 – 55
N.Parnitha Boreholes	1993	-	43	64	300	60 – 80	50

Source: EYDAP, 1995, 1996, Koutsogiannis et al, 1990, 2000, YPAN, 1996.

The water supply system of Athens depends on and influences three major watersheds. Those of the rivers Mornos, Evinos and Biotikos Kifisos (lake Iliki and boreholes). The basic data for these water basins is summarized in Table No 6. The reservoirs of Mornos and Evinos are situated on the upper flow of the rivers, while Lake Iliki receives the discharge of Biotikos Kifisos. The competition between water supply and other uses and the quality pressure are, as expected, much grater for the case of Iliki. The lake gets the flows, from the irrigation returns in the plain of Kopaida (heavily polluted due to agricultural use), and from the middle route of Biotikos Kifisos. Although prohibited, there are cultivations in the surrounding area and even at the bank of the lake. The increasing banking and abstractions from Biotikos Kifisos for irrigational uses upstream of the Lake has led to a reduction of the inflow to the lake (Mamasis, Nalbantis, et al 1995). During the irrigation period superficial dykes prevent the river flow from passing through the tunnel of Karditsa and reroute the water for the irrigation of neighboring fields (YPAN, 1996). Wirdrawals for agricultural use take place also from lake Iliki itself where the irrigation organization of Kopaida has a pumping station. In total approximately 100 hm^3/per year from the potential inflow of the lake are used for irrigation.

The drillings of EYDAP are situated all around Lake Iliki, collecting part of the underground seepage of the lake, and in the basin of Biotikos Kifisos, which is especially rich in underground water resources (regulated reserves 500 hm3/yr – YPAN, 1996). Still the pumping from these drillings during arid periods of water shortage has created tension with the neighbouring communities and farmers, who also pump groundwater (Dandolos and Papapetrou, 1994). The estuary of V. Kifisos regardless of its degradation due to agricultural activities is still very important part of a European network of important biotopes (Hatzibiros and Papagrigoriou, 1994).

Table No 6: The river basins of the hydrosystem of Athens

River Basin	Basin area (km^2)	Annual river run-off (m^3/s)	Population in the whole basin	Irrigated surface (ha)	Nature
Mornos	998	15	305,000	900 (estuary) 700 (upstream route)	Mornos delta and estuary
Evinos	1,111	28		2,400 (downstream of reservoir)	Evinos River Messologhi lagoons (Ramsar Convention protected site)
Biotikos Kifissos	2,432	11	560,000	13,850 (upstream of lake Iliki) 20,300 (for the whole of the basin)	Fisheries – Yliki lake habitat Riverine Ecosystem of Biotikos Kiffissos

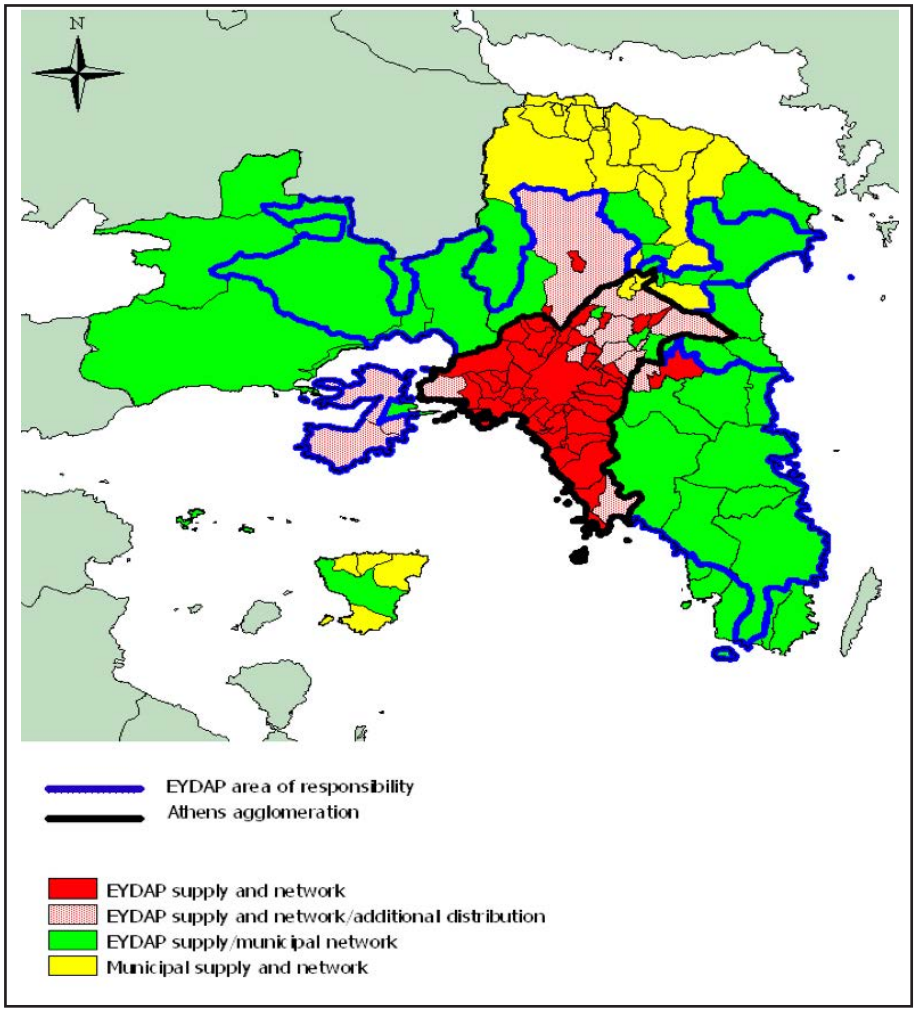
The water reserves of Mornos and Evinos are situated in mountainous locations. The surrounding areas are among the least developed of the country. The GDP of the district of Western Sterea Ellada is 75% of the mean for all regions of the country (YPAN, 1996). The lack of human activities or large settlements around the reservoirs (with the exception of some irrigative drillings in the Mornos area), ensures both the quality and the quantity of water for the reservoirs. The dam in Mornos collects and reroutes towards Athens the flow of the river. The deprivation of downstream flow combined with the development of agricultural activities in the valley has led to the degradation of the natural estuary of the valley and the delta of Mornos, which in their natural state and with contemporary legal standards would have been characterised as especially an important and under protection natural reserve (Hatzibiros and Papagrigoriou, 1994). The impacts of the dam in Evinos cannot yet be evaluated since it was constructed very recently. The diversion of significant quantities of water towards Athens can affect the replenishment of groundwater horizon and discharges in the downstream springs of the city Naypaktos (south of the reservoir). Furthermore the flow at the delta of the river can be affected, impacting on the natural reserve of the lagoons of Mesolongi (part of a Ramsar Convention – protected site). Reduced downstream flows may also impact

recreational activities in the middle route of the river (Hatzibiros and Papagrigoriou, 1994, Heurteaux and Soulios, 1993).

Network and consumption

Four Drinking Water Treatment Units (WTUs) in the areas of Galatsi, Menidi, Kiourka and Mandra, supply the network (total mean supply capacity of 1.46 hm^3/day reaching 1.94 hm^3/day in peak days - EYDAP, 1996). EYDAP supplies with water almost all the population in the region of Attika. The traditional "service area" of the company almost coincides with the administrative boundaries of Athens-capital. Its "jurisdiction area" expands to cover most of the region. Some municipalities in the periphery of the region retain the responsibility for the operation of their networks, only receiving treated water from EYDAP. Few small municipalities use local sources for their supply (either exclusively or in addition to EYDAP supplies) (Map No 4).

Map No 4: Athens, EYDAP and municipal networks

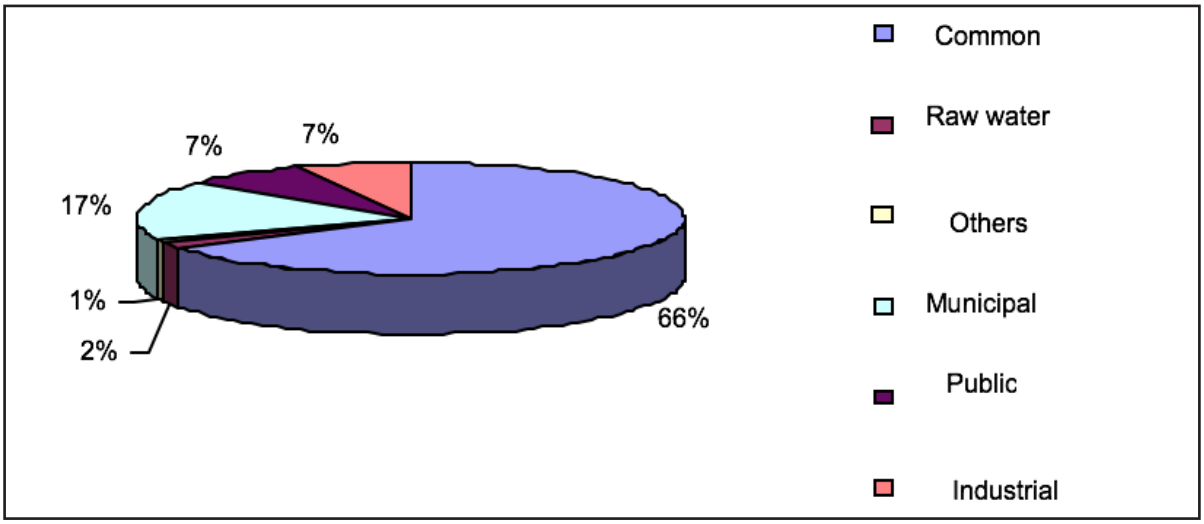


The distribution network of EYDAP has a length of over 7,000 km and serves 1,650,000 'customers' (number of connections-meters). The peripheral municipal networks are catered through large supply pipes. There are no data for the municipal networks. The total length of municipally-owned networks was estimated to be over 3,000 km in 1992, serving some 160,000 connections (Vafiadis, 1992).

EYDAPs' annual abstractions from the reservoirs are about 400 hm^3 (EYDAP, Water conveyance office). Approximately 7% water abstracted is lost during conveyance or processing to drinking water. From the treated water that comes out of the WTUs, 76% is measured by end-use meters and priced (EYDAP, annual statistical report 1999). The remaining 24% is lost due to cracks in the pipes or other undetected leakage or relates to under-measurement by old and faulty meters. Losses are higher in the municipal networks ranging from 10% to over 50% depending on the age and type of the network (Vafidis, 1992).

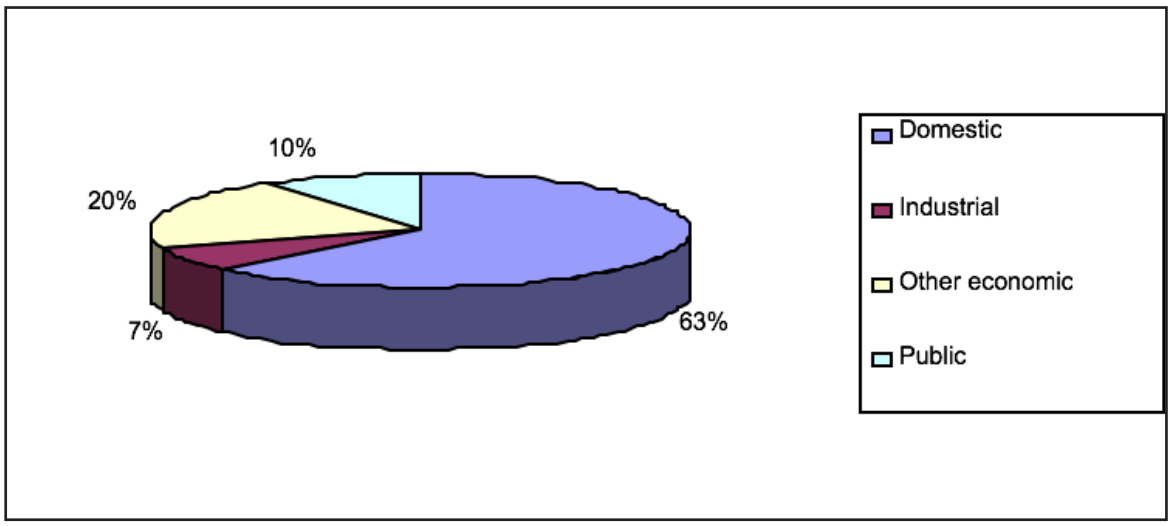
The distribution of consumption for the different categories of charged users is presented in Chart No 4. The "common" use category includes domestic and small professional users, "industrial" use includes industries and big professional users (companies, big stores, etc), "municipal" use includes the treated water supplied to municipal networks, "public" use refers to public institutions (ministries, municipal authorities, schools, churches, etc) and "other uses" includes a range of specific users charged with special rates (e.g. Port of Pireaus, firefighting authorities, etc). The distribution of the final water consumption per category of different use is presented in Chart No 5. As mentioned some municipalities utilise local water resources in addition to those of the network of EYDAP. Groundwater is used through drillings for irrigational and industrial uses. These are estimated at 50 hm^3/year while the direct withdrawals from private and public drillings (watering gardens etc.) are estimated to be up to 30 hm^3/year (Dandolos and Papapetrou, 1994).

Chart No 4: Water use per charged category - average 1996-2000



Source: EYDAP, 2001

Chart No 5: Water use per type of use in 1999



Source: EYDAP, 2000.

Sewerage and waste-water treatment

In the sewerage sector, EYDAP since 1980, when it incorporated the pre-existing "secretariat-organisation for Athens' sewerage management" (OAP), has undertaken the conveyance of municipal and industrial wastewaters from the urban area of Athens, 80 Municipalities are under EYDAP jurisdiction. Since the beginning of EYDAP operation, Athens wastewater network was expanded and many kilometers of pipes were added to it. Among these, there is also another big diameter pipe, the Supplementary Interceptor Sewer (SIKAA), in the 1980.

The Sewerage of the Athens Metropolitan Area consists of both, storm water runoff and sewage pipes. The storm water runoff flows reach, by gravity, to the sea (Saronic Gulf), and the sewage pipes discharge at the Psyttalia island sea region after undergoing wastewater treatment at the Psyttalia w/w treatment Plant. The total length of the network is 5,800km and covers 92% of the wastewater needs of the area. Sewerage connections are fewer than water supply. The large diameter sewers (KAA, SKAA etc.) run through areas where the slopes permit the conveyance of the wastewater by gravity (gravity sewers), with only exception the Saronic Gulf Coastal Collector, which operates with the assistance of 42 pumping stations.

In the early 1980s, the planning of an integrated sewerage and wastewater treatment system was finalized. The planning suggested the construction of a wastewater and septage treatment plant at Metamorphosis Attica and another wastewater treatment plant on the island of Psyttalia. The Metamorphosis Plant is in operation since 1985 giving primary and secondary treatment. The Plant treats waste from the remaining sewerage pits in Attica and part of the sewerage of the northern suburbs of Athens. It has a nominal capacity of 24,000 m^3/day from sewerage pits and 20,000 m^3/day from

the sewerage network, corresponding to a population equivalent of 250,000. Secondary treatment is provided currently for about 21,000 (8,000 + 13,000) m^3/day of sewerage.

The Psyttalia Plant is the main waste-water treatment plant of Athens. Its construction started in 1983 with the aim of receiving all the waste-water of the region of Attica. The first phase of the work was completed in 1993 with a total cost of 81 MEuros. It consists of pretreatment, primary treatment and management of the sludge produced. Athens' sewerage (about 750,000 m^3/day) undergoes a pre-treatment (screening, etc) in the coastal location of "Akrokeramos" and then through a pipe is transferred to the islet of Psyttalia in the Gulf of Saronikos, where the treatment plant is located. Primary treatment has led to a reduction of suspended solids by 43% (expected concentration 200 mg/lt) and BOD by 38% (expected concentration 155 mg/lt). The second phase works are under construction and the include aeration and secondary, biological treatment. Upon their completion, suspended solids are expected to decrease to 35 mg/lt and BOD to 25 mg/lt.

Characteristics and Trends of Water and Sanitation Services

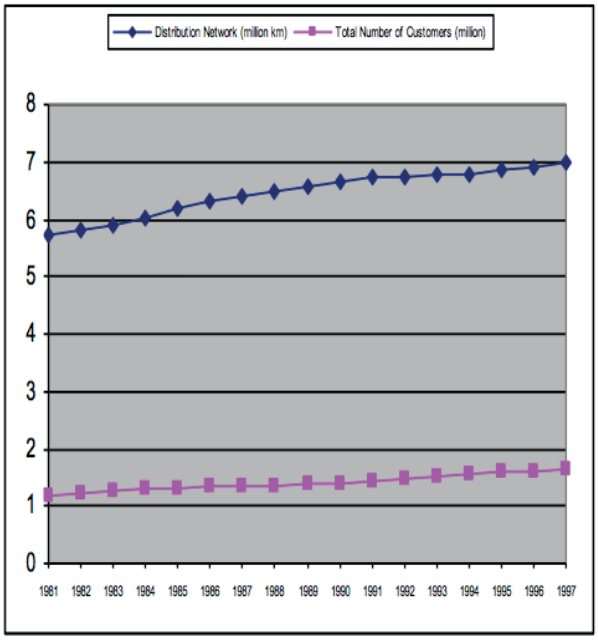
Trends in the distribution network

The founding law of EYDAP in 1980 defined as the service area of the company a wide area around Athens-capital. With the addition of some further separate bi-lateral agreements between EYDAP and individual municipalities, the service area of EYDAP today covers nearly 99% of the total population of the Attica region. The government's policy objective ("consciously" or "unconsciously") was that all population of the metropolitan area is provided with an adequate and affordable continuous water supply service. In the early 1980s this was nearly the case in the core of the Athens agglomeration supplied by the predecessor of EYDAP (connection coverage reaching 96% of the population - KEPE, 1990), but was not generally so for the municipalities of the periphery which relied on local resources of questionable quality and intermittent, low pressure supplies. Population growth in peripheral communities led to the abstraction, pollution and eventually deterioration of local resources which, coupled with the increased demand, stressed further the need for access to the central supplies of EYDAP. While some municipalities were incorporated in the EYDAP network some others opted to retain control of their networks. Instead, a special arrangement was developed by which EYDAP could supply municipalities with bulk quantities of water and then the municipalities be responsible for distribution to individual users.

The 1980s was a decade characterised by the extension of the network both to new users within the already supplied areas (and incorporation of whole municipal networks) and to new bulk municipal users in the wider Attica region. Data in Chart No 6 and the accompanying table illustrates the trends in internal extension.

Chart No 6: Evolution of network 1981-1997

Year	Nr of Customers	Distribution Network (km)
1981	1,198,956	5,724,000
1982	1,222,310	5,802,000
1983	1,260,108	5,890,000
1984	1,296,409	6,016,000
1985	1,317,554	6,186,000
1986	1,340,431	6,308,000
1987	1,359,354	6,407,000
1988	1,362,233	6,479,000
1989	1,383,138	6,574,000
1990	1,403,658	6,665,000
1991	1,434,008	6,721,000
1992	1,477,325	6,751,000
1993	1,509,287	6,770,000
1994	1,546,396	6,794,000
1995	1,580,642	6,847,000
1996	1,603,767	6,894,000
1997	1,625,815	6,994,000



Source: EYDAP data.

As the data shows the number of customers in the 1981-91 period grew by 19.6%; in comparison, in the same period the number of households in the Attica region grew only by 6.63% (4.31% in the Athens agglomeration) (ESYE census 1991, data processed for present research). Thus the overall growth of the network was primarily due to the incorporation of whole municipal networks within the service area and less due to the natural rate of increase of customers within the pre-existing service area.

The extension of the network to supply water to municipalities in the wider periphery of the Attica region was also important. Customer and network length figures can not grasp the width of this expansion but it is illustrative to note that water use by municipalities in bulk rose from 2 hm^3/year in 1982 to 41 hm^3/year in 1997, accounting for about 15% of total water use.

For EYDAP the reluctance to uptake some municipal networks may be attributed to the high costs related to improving the condition of such networks, their character (e.g. supplying to dispersed ex-unlicensed residences, non-horizontal residential units, etc.) and the lack of a sewerage network in the areas. Municipalities on the other hand have also in many cases refused to hand over networks to EYDAP for several reasons. These include the importance of water charges as a source of municipal revenue; the potential threat to local activities that received water free of charge and concerns for the fate of the municipality personnel working in water supply.

Provision of water from EYDAP to Attica's municipalities has been typically followed by an increase in total water use and the partial or, more often, complete abandonment

of the local utilised resources. The deterioration of the quality of the local resources, the competitive cost of EYDAP water and its ensured drinking water quality have contributed to this outcome.

The cost of water to the municipalities has been heavily subsidised by EYDAP, reflecting a government's "policy" for cheap water provision to the rural communities of Attica. EYDAP's cost of "producing" and delivering water has been estimated approximately at 0.35 Euros/m^3; bulk municipal water supplies were charged until recently with 0.19 Euros/m^3. In comparison, during the same period normal household water customers of EYDAP's network in the 5-20 m^3/month band were charged with 0.52 Euros/m^3. On the other hand, one has to note that the additional costs of EYDAP to supply the municipalities were also low (given the fixed costs of the existing infra-structure); thus the incentive to EYDAP to expand its bulk supply to new municipalities. Many municipal authorities, prone to submit to local groups' and individuals' pressures, granted water free to a variety of users (such as small agricultural production, municipal irrigation, churches, schools, or even local "winter" residents, etc). These free uses resulted in a considerable dis-incentive for a rational use of water. Even more, many municipalities refrained from paying their duties to EYDAP and a significant debt accumulated in the years from outstanding charges and/or debts from network-related projects carried out by EYDAP and which were supposed under contractual agreements to be covered by municipal funds (e.g. for network expansion, connection of mains to municipal networks, etc.). In total, 11 municipalities in 1999 owed to EYDAP about 37.2 MEuros on outstanding debts (EYDAP, 1999). There are different opinions however on whether this accumulating debt is due to financial mis-management on the part of municipal authorities, whereby charging their users at normal prices and underpaying EYDAP they were cross-subsidising other municipal activities (EYDAP, 1996) or whether the cost of operating and maintaining the distribution and sewerage networks was excessive for the municipal authorities and not adequately recovered by existing charges (Vafidis, 1992, Kallis, 2003).

For EYDAP, recovering its debts from the municipalities has become a strategic priority. Cutting off the water supply to whole municipalities is a non-option; moreover, as debts have mounted municipal authorities, blaming their predecessors, have declared inability to pay them off. The main option left to EYDAP has been the take-over of the municipal networks at a price equal to the owed debts. This may raise in the short-term the revenue of the company as water use in these municipalities would be charged at standard EYDAP levels and as non-charged users would be charged but on the other hand, the significant costs for network improvement and maintenance would have to be faced. Indebted municipalities also react to this prospect as they value their networks higher than the accumulated debt.

Extension of the network, mainly in terms of incorporating new municipal networks and extending to regions beyond Attica, are expected to be the dominating features in the years to come (EYDAP, 1999). The expected "extension of housing areas and the needs of the 2004 Olympic Games" are the main factors of EYDAPs' strategic planning for the water supply in Athens (EYDAP, 2002: 11.1). In a number of statements, interviews, etc., EYDAP and national key actors have defined the strategy of the company as one of "becoming a regional water provider" and expanding water supply to remaining Attica areas and to surrounding and aqueduct-proxy non-Attica areas..Basic targets are the

"the extension of supply network to the consumers, but also to the municipalities of the EYDAP responsibility area, in order to ensure nonstop supply", "the increase of the supply capacity of the network" and "the extension to the water supply of municipalities in the wider Attica region (NE and NW coast)". This includes the "take over and improvement of municipal networks that are already supplied by EYDAP and the provision of water services to the few municipalities that do not receive water from EYDAP as yet" (EYDAP, 1999). The company has an incentive to expand its network to new municipalities (in terms of the economies of scale in providing water through a centralised resource and network system and the related increase in revenues) and/or to take over municipal networks (as it will increase its revenues through higher charges; it will reduce lost water; and it will rationalise its finances with respect to municipal debts).

It is expected that until 2005 all the municipal water supply networks will be placed under the responsibility of EYDAP "due to the incapability of municipalities to maintain them, and to pay their debts to the company" (Newspaper "Naytemporiki", 8/8/01). The cost of "internal extension", meaning the extension of EYDAP's network to new customers within the existing service area and the connection of the last few non-serviced clusters within it, is to be funded by revenues and by investments made by EYDAP (approx. 40 MEuros for the period 2000-2008). The expansion in the Attica region and beyond (approx 91 MEuros) is foreseen to be funded by EYDAP's investment program (60% to be secured by European or State funds) (18% of the total investments for water supply). An initial estimation by EYDAP for expanding to east Attica and Messogia, estimated needs for 1000 km of pipes that would cover more than 200,000 connections (EYDAP, 1996). Works have already commenced and drinking water and sewerage pipes have been laid out to the municipalities around the new airport (EYDAP, 2001, 2002).

EYDAP is also planning expansion to municipalities of Attica outside its jurisdiction area as well as in areas outside the geographical boundaries of Attica. Feasibility studies have been carried out for the water supply of the islands of Aigina and Ydra to the south, Evia, and the region Biotia and the city of Thiva to the north as as well as the city of Kornithos to the south (EYDAP information Source, 20: 34). Ann undersea pipe as an extension to the already existing one to Salamina, was promoted by EYDAPs' management for the case of Aigina and Agistri with the prospect of setting a water supply system for all the islands of the Argosaronikos Sea (Newspaper "Eleytheros", 30/3/00 and "Xrimatistirio", 20/6/00)

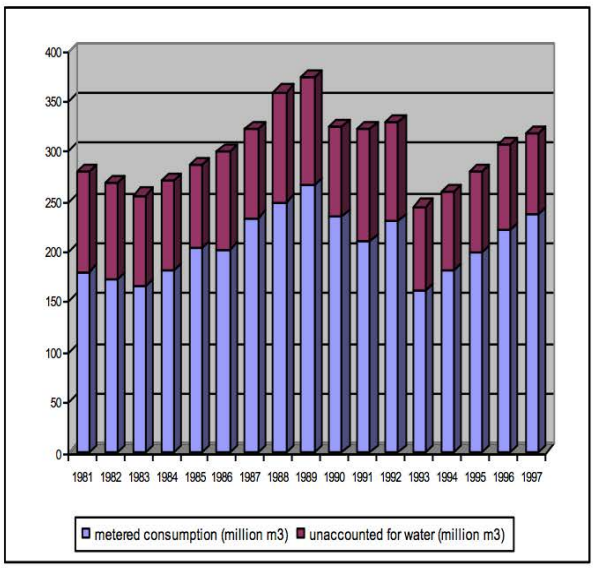
Perhaps the most ambitious plan is that concerning the water supply of the island complex of Cyclades. A feasibility study has been appointed by EYDAP to the National Technical University. The study will explore the possible ways that EYDAP can contribute to the drinking water provision of the islands (including water transfers by boats or undersea pipes, participation in partnerships for the construction of local water supply works and the expansion/modernization of the networks, transfer of bottled water) (Newspaper "Apogeumatini", 5/5/00). For the transfer of water to islands with tankers the necessary installations for loading had been already constructed in the port in Lavrio and in 1998, EYDAP had come close to an agreement with Cyprus Republic for the transfer of 14.6 hm^3 for the summer period. Water would be sold in cost prices but the arrangement and the transfer expenses would be covered by Cyprus (Newspaper "Ta Nea". 05/11/98).

A recent economic crisis in EYDAP has led to a relative retreat of expansion plans and concentration on the "absolutely necessary projects in the service area, meaning only the internal water supply network of Attika" (EYDAP information source. 28: 8). Top management encourages only projects that have an short-term net profit and expansion projects have uncertain and long-term returns (EYDAP interview, 5/12/02). Whether the spatial expansion of the network can proceed without some kind of State funding is unknown. According to a study by Knight Piesold (EYDAP, 1996), an expansion of the network to eastern Attika could be paid-off within 5 years, but would require a very high initial investment of approximately 120 MEuros. The proposal was to fund the project only from the extra revenue from new consumers joining the network and paying higher prices than they did in the municipal networks. The expansion of the network in other areas is considered very expensive since new supply pipes are needed, and it has to be set aside as long as there is no State funding or the municipalities are not ready to undertake the connection costs.

Both the pre-existing network of EYDAP primarily in the older parts of the city, and the poorly constructed/maintained and spatially-extended municipal networks arefacing considerable leakage and losses (KEPE, 1990, EYDAP, 1996). Chart No 7 and the accompanying table present the evolution of total un-accounted for water (in EYDAP network only) as a proportion of total water input from the treatment plants.

Chart No 7: Un-accounted for water versus total water input from the treatment plants

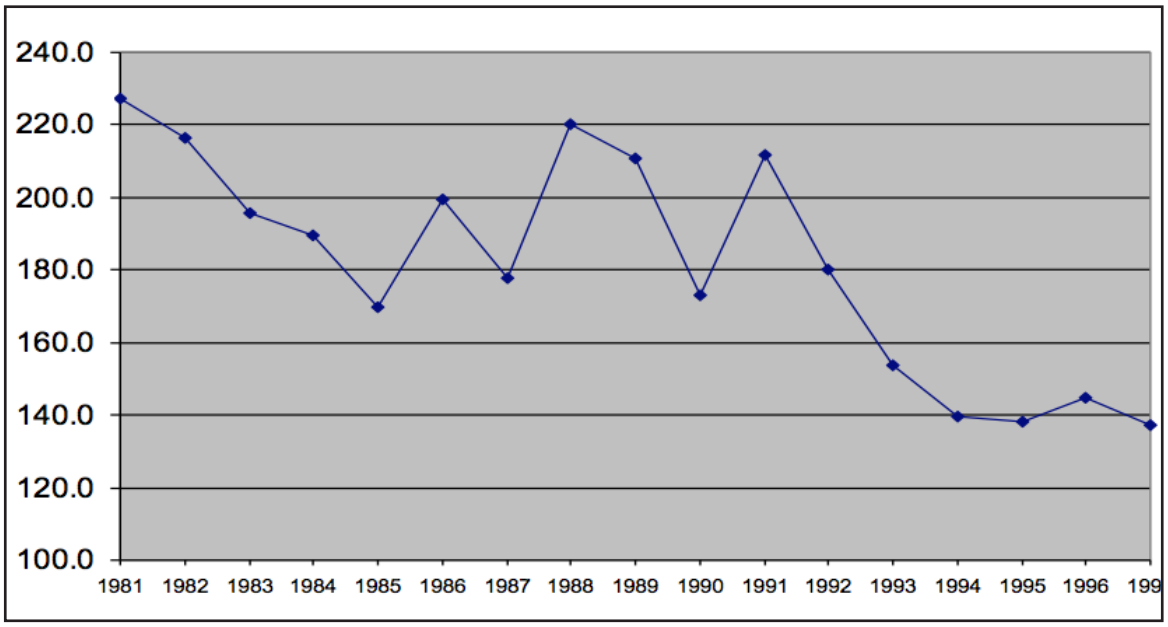
Year	Total Water Input (Mm^3)	Metered (hm^3)	Free of Charge (hm^3)	Un-accounted for (hm^3)
1981	281.8	179.7	2.6	99.5
1982	273.8	172.4	4.8	96.6
1983	261.2	165.9	5.4	89.9
1984	275	180.6	4.7	89.7
1985	291.3	203.9	5.8	81.6
1986	306.5	202.3	6.7	97.5
1987	328.6	233.7	6.6	88.3
1988	361.7	249.2	3.1	109.4
1989	375.8	266	3.3	106.5
1990	326.5	235.1	2.7	88.7
1991	323.8	210.4	2.5	110.9
1992	330.2	230.9	2.2	97.1
1993	246.3	160.2	1.5	84.6
1994	260.9	180.5	1.6	78.8
1995	280.2	199.1	1.5	79.6
1996	307.4	221.3	1.4	84.7
1997	319.4	236.8	1.2	81.4



Source: EYDAP data.

It is difficult to assess the extent to which un-accounted for water is due to leakage and losses or due to under-registration of final consumption by faulty meters. Since 1991 EYDAP has undertaken an intense program of meters replacement. This is carried out by an external contractor, the costs being covered by the users. In 1996 about 400,000 of the 750,000 volumetric meters were replaced while also a program for the replacement of old meters started. Today it is estimated that about 160,000 old meters remain in the network (of a total of 1,650,000 meters in 1998). Improvement in meter registration since 1991 is illustrated in the evolution of un-accounted for water per connection (Chart No 8). Nevertheless, the still important and increasing quantity of un-accounted for water from 1997-2001 and at near completion of the meters' replacement programme highlights a considerable level of real losses.

Chart No 8: Evolution of un-accounted for water in lt/connection/day



Source: EYDAP – data processed for present research.

Trends in water consumption

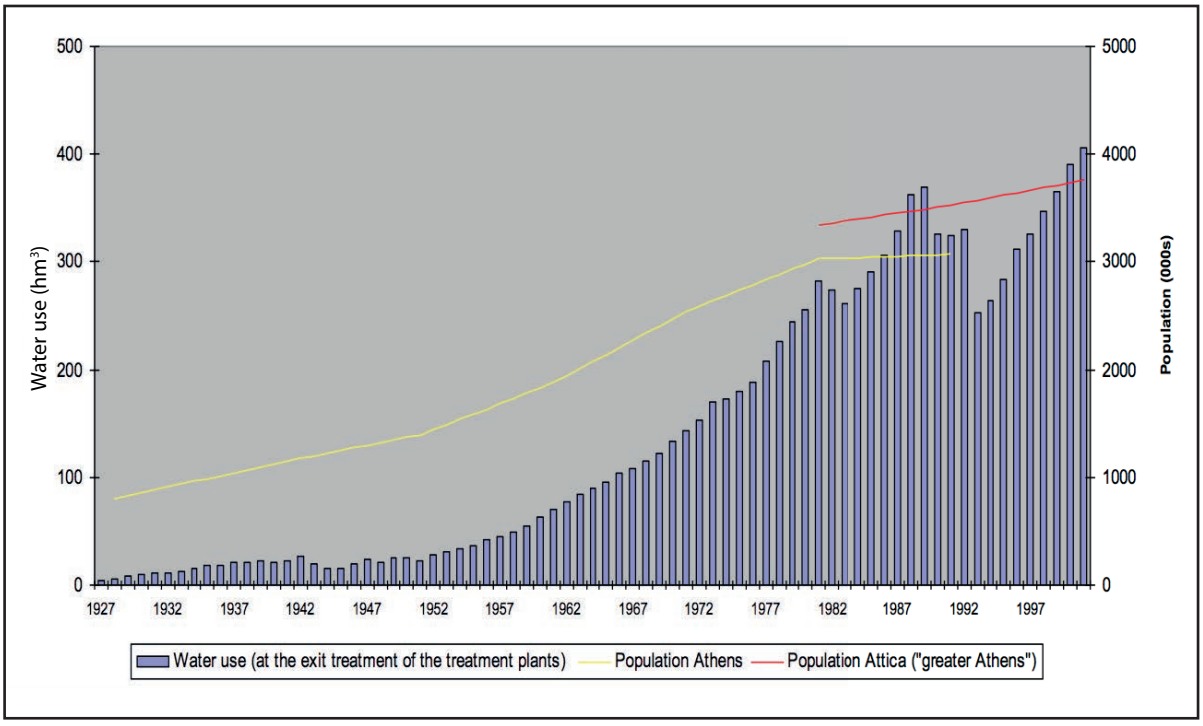
Chart No 9 shows the evolution of water use in Athens from the construction of the first modern work of the city (Marathon reservoir, Galatsi treatment plant and distribution network in central Athens and Pireaus) in 1928 to these days. Water use increased many-fold in the post-war decades (1950-1970). This was a period of an intense urbanization of the city. Water use increased even faster than the population (Table No 7), reflecting a process of new housing. New houses were equipped with modern domestic appliances and more water-demanding habits increasing per capita consumption.

Table No 7: Development of population, water use and network

Year	Population Athens-capital	Water use (hm^3/yr)	Network length (km)	Connections
1928	802,000	6.1	915	-
1931	-	11.4	-	48,043
1940	1,124,109	20.9	1,295	110,670
1951	1,394,922	21.9	1,386	141,959
1955	-	36.9	-	200,000
1961	1,876,009	70.9	2,458	-
1971	2,540,410	142.9	4,172	-
1977	-	207.2	-	1,017,151
1981	3,027,560	281.8	5,724	-
1989	-	-	-	-
1991	-	-	-	-

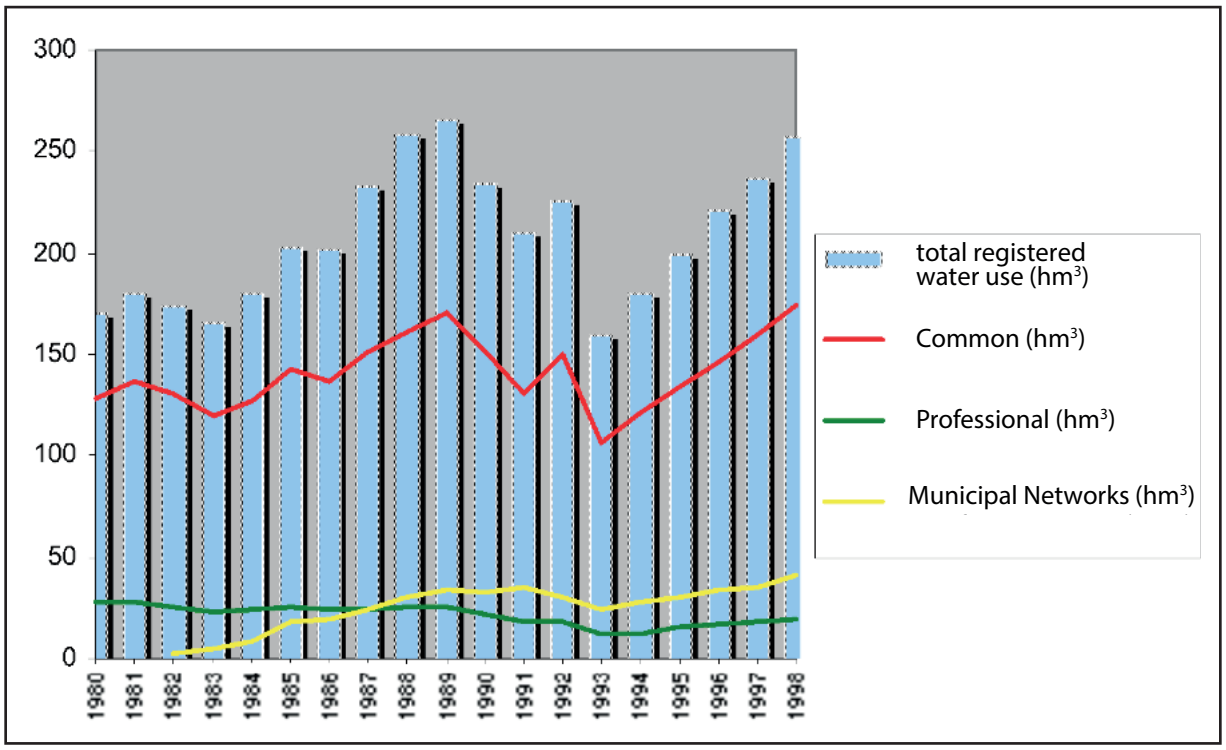
Source: National Census, EYDAP archives

Chart No 9: Evolution of Athens' water use



Although the population of the city was stabilised in the 1980s, water use continued to increase and reached its historic maximum in 1989. This was mainly due to the process of expansion of the network to the suburbs and periphery of Athens (see above), either by direct incorporation of municipal networks (showing up in the increase of "common" use) or by supply to municipal networks (showing up in the increase of the "municipal" category) (Kallis and Coccossis, 2003) (Chart No 10).

Chart No 10: Evolution of water use per category of user (1981-1998)

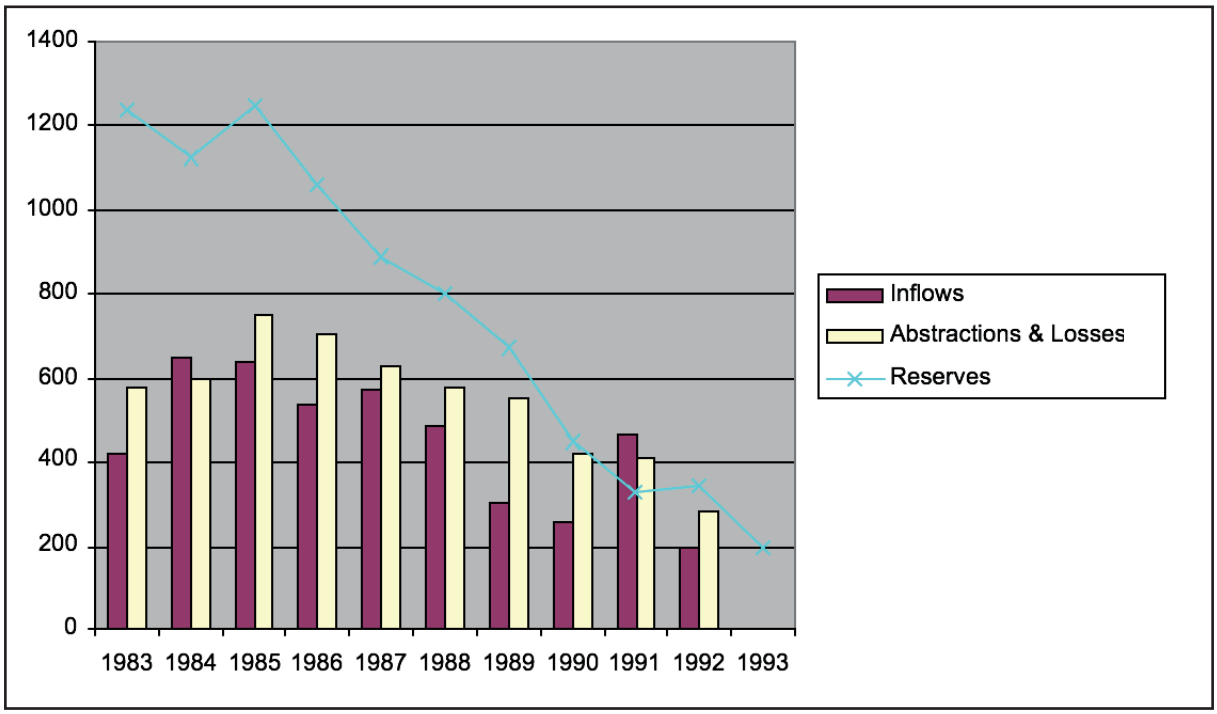


Source: elaboration from EYDAP archives

In 1980 the massive reservoir of Mornos was put in operation, tripling the expected annual availability of water per capita. Yet, although population of Athens did not increase in the 1980s, in 1989 Athens faced a sever drought crisis, its reserves nearly exhausted (Karavitis, 1998). A comprehensive analysis of the factors behind this crisis is provided in Kallis, 2003, Chapter 7. Trying to cut down costs, EYDAP used predominantly the Mornos reservoir instead of this of Yliki. The result was that Mornos reserves quickly decreased but Yliki was also loosing its reserves through the sinkholes. EYDAP was under-investing in network maintenance and losses control and did not undertake any efforts to control demand or to keep in use the secondary, local sources (Kallis, 2003, Kallis and Coccossis, 2003). As abstractions and losses from the reservoirs increased, the reserves of the resource system were falling down. A relatively unusual sequence of dry years starting in 1988 ended up with a crisis when the reserves of the city almost exhausted in 1990 and 1992 (Chart No 11). This however need not have been the case

if EYDAP had had a more balanced share of abstractions from Mornos vs. Yliki, had controlled water use or if it had not rushed to supply new municipal networks (Kallis, 2003).

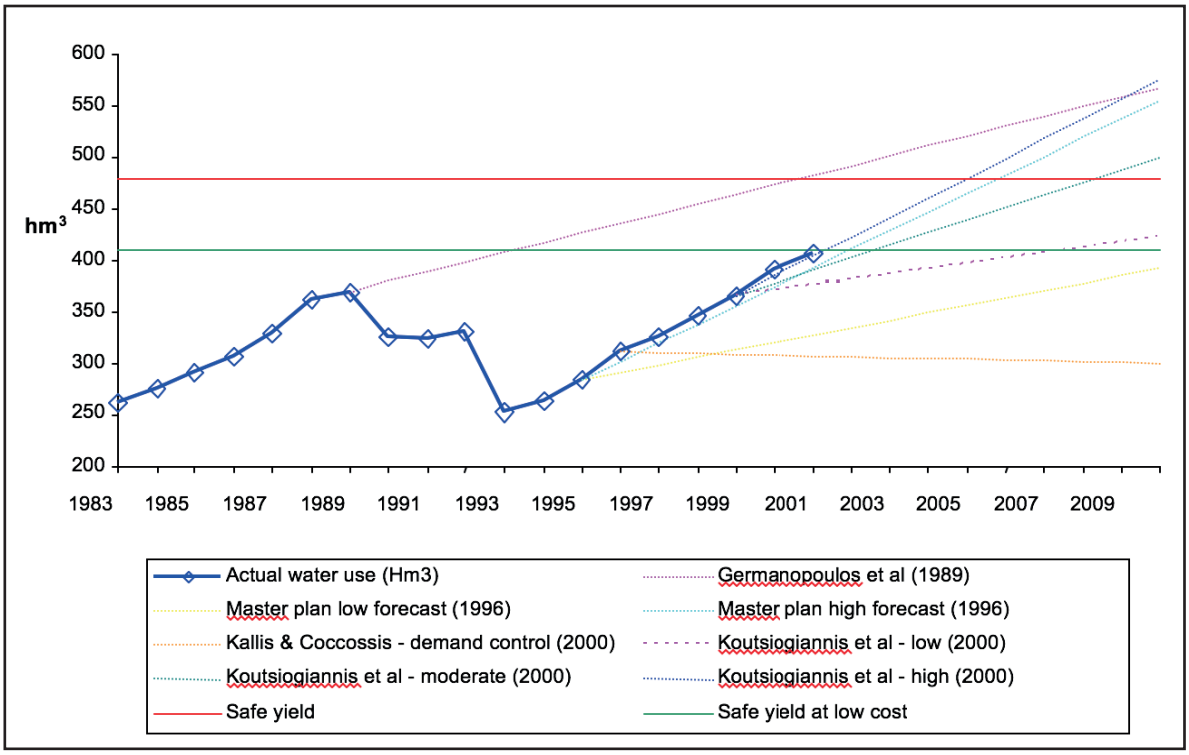
Chart No 11: Inflows and abstractions from Athens' reservoirs in the pre-drought and drought periods (in hm^3)



Source: based on data by EYDAP

A dramatic rise in prices and an intense media campaign reduced demand while the drilling of boreholes in the basin of Yliki provided new sources of supply. It was also decided to build a new reservoir in the river Evinos to supplement Mornos. The reservoir had important ecological impacts on the downstream wetlands, the flow of the river and possibly to the groundwater system of the basin (Hatzilakou et al. 2002). With the end of the drought and the addition of the new supplies to the system, supply was secured again. Restrictive policies and measures were removed and the policy once again one of expansion of the network. Water use increased again and by 2000 had surpassed its pre-drought maximum (Charts No 9, 10). A key water policy issue stems from this trend of an increasing water consumption. A more accurate estimation of source yields reveals that given trends the 1% supply failure risk will be surpassed by demand within this decade (Chart No 12), despite expectations that the new water works had secured availability of supply until 2030 (Kallis, 2003, Kallis and Coccossis, 2003). A potential new expansion of the hydrosystem to the west, potentially to the ecological reserve of the Acheloos river, implies detrimental environmental impacts (Kallis and Coccossis, 2000). Intensification of abstractions from the Yliki basin breeds conflicts with agricultural uses in the basin, especially in drought periods (Kallis, 2003).

Chart No 12: Forecasts of water consumption and sources' yield



Trends in sewerage services

The most important development is the progress with the completion of the secondary treatment unit at the plant of Psyttalia, which receives the majority of Athens' waste-water. There are also on-going works for energy recovery in the plant and sludge treatment and safe disposal.

A key issue is the provision of sewerage services to the urbanising Messoghia plain and the eastern coast of Attica as well as the Thriassion plain in the west. EYDAP is studying and preparing for the extension of the sewerage network in these areas. There is also planning for the construction of smaller, local wastewater treatment plants in the eastern coastal areas (Marathon, N.Makri, Spata Airport, Anavissos, Saronis, P.Phokea, Kalivia Coast, Legrena, Charax, Keratea, Lavreotiki, Lavrio, Ag.Konstaninos) and to the west (Thriassion Pedion). Currently sewerage from these areas is directly disposed to the sea.

EYDAP is also studying the improvement of the sewerage network in many areas of the city which are currently underserved and where many households depend on sewerage pits (collected by trucks and disposed for treatment in the Metamorphosis plant). A considerable part of the investment plan of EYDAP (see next chapter) is devoted to the expansion of the sewerage network, the replacement and repair of the existing network and the installation of new pumping stations that will improve delivery.

Another important target is the construction of a supplementary sewerage pipe that will receive excess run-off, alleviating stormwater run-off to the Gulf of Saronicos, especially from the southern suburbs.

Policy, Institutional, Socio-political and Cultural Environment

Legal framework and water services pro-privatisation

Until recently (1999), Athens' water supply and sewerage services were regulated by Law 1086/1980, founding law of Athens Water Supply and Sewerage Company (EYDAP) S.A. Law 1080/1980 regulated all other municipal water utilities and municipal water departments of Greece (including those within Athens, which retained the responsibility of their own networks).

EYDAP was founded as a limited company operating under private law but with the objectives of a "public utility". The Greek State was the sole stockholder. EYDAP incorporated Athens Water Company S.A. and the Athens Organisation for Sewerage, which was a public body. The supervision of EYDAP was under the Ministry of Public Works (MPW). Later, when the MPW was incorporated in the Ministry of Environment, Spatial Planning and Public Works (MESPPW), the responsibility for EYDAP remained with the undersecretary with the portfolio for public works. All the other public water companies in the country were under the Ministry of internal Affairs (later it became Ministry of Public Management and Decentralisation).

Presidential Decree 488/1987, activating Law 1365/1983 concerning the "socialisation of companies of public character or utility", set a nine-members Board of Directors, consisting of five representatives of the State, two of the employees and two from the local authorities serves. The board of directors, the president and the general manager of the company (who is in the head of all departments and is the highest executive of the company) are determined by the Government with a common decision of the Minister of ESPPW (Environment, Spatial Planning and Public Works), the Minister of Internal Affairs and the Minister of Economy. The same ministries were to represent the Government in the council of EYDAP's shareholders.

With the founding law of EYDAP, all assets relating to water supply and sewerage of the area of Athens (resources, conveyance and treatment systems included) were transferred by predecessor companies and the state to EYDAP (with their pending credits). The duty of EYDAP was the operation and development of all necessary systems for the supply of its area of responsibility. The area of responsibility was extended from that of its predecessor (which was confined mostly to Athens -capital) to all the Attica region. The task of the company was to supply all users within this area with water and sewerage services of pre-defined standards (for water supply defined in 1983 at a charter of service operation). The assets of the company were evaluated and 1,000 stocks were issued in the name of the Greek State.

With respect to municipal networks within the area of responsibility of EYDAP, the provision was that within 6 months the company should reach a financial agreement with the municipalities for the take-over of the networks. In case an agreement was not reached a judicial procedure was foreseen.

The main sources of revenue for the company are the charges for water supply and sewage, a special tax on new buildings and a charge for new connections. The cost of pipes serving municipal networks fall upon the local authorities, while the additional expense for constructing water supply network outside the conventional housing zones burden the customers- house owners. Water prices were designed in order to cover capital and operational costs of the company as well as pending credits and interest rates. In addition, surplus revenues would be used for long-term investments and for paying a dividend to the shareholders (i.e. the State and the municipalities). Tariffs were to be decided by a multi-ministerial committee headed by the Minister of National Economy (with the Ministers of Public Works, Co-ordination and Internal Affairs) under the proposal of the Board of the company with respect to the above objectives. There was no provision for a regular review.

Although EYDAP assumed the responsibility for all drinking water and sewerage works, it was foreseen for major projects (especially, dams and wastewater treatment plants), to delegate (upon the request of the Board of EYDAP) the responsibility for financing and construction of the water work to the Ministry of Public Works.

EYDAP was intended to operate as an independent limited company of public utility under public ownership and control (more or less corresponding to a model of a public enterprise under "legal privatisation" - Kraemer, 1997). In practice, the organisation of Athens water sector in the 1980s and most of the 1990s resembled a statist model, EYDAP being managed as a "branch" of the Ministry of Public Works. Directors and presidents were directly appointed by the government (and frequently changed). The government was directly responsible for hirings and could also transfer employees from other public sector services to and from EYDAP. The government had also a direct intervention in practical matters such as delivering water free of charge to certain uses, etc.

EYDAP from its founding was financially burdened with the debts of its predecessors and pre-1974 unpaid credits and interests from the Mornos project and from sewerage works which were passed to the company in 1980. Moreover, the company undertook the task to finish off segments of the Mornos aqueduct and intervene in the considerable deficiencies in its construction that emerged in operation. Also, the State delegated the task to EYDAP to finance and construct public projects for the drainage and flood protection of Athens without economic reward for those.

On the other hand prices, with the exception of an increase in 1982 were not changed regularly and when changed did not reflect the costs of operation of EYDAP but the payment of accumulating debts. The institutional role of the board of the company in the determination of the prices was sidelined other than in pressing and bargaining with Ministers and the government for a review of charges to reflect inflation-growing costs and growing annual deficits. Decisions on utilities' prices were taken by a multi-Ministerial "Committee of Prices" at irregular intervals. Water prices were kept constant

as part of inflation-control policy, in a period where annual inflation rates were in the order of 30%. Although increasing water consumption secured that revenues surpassed operational costs, EYDAP was fast accumulating a deficit due to the interest rates on pending credit (KEPE, 1990). This precluded any sort of a longer-term investment, led to poor maintenance of the network and control of losses, and provided a disincentive against demand-side management or a wiser use of the Mornos-Yliki system that would have prevented the drought crisis (Kallis, 2003).

In 1992 the state increased its stocks in the company by capitalising its pending credits in an effort to rationalise the finances of EYDAP. However in 1993, the state withdrew a tax applied to all new building constructions (3% of cost) and assigned to EYDAP. The promise was to replace it in due time by a more suitable fund. This created a new substantial deficit in the budget of the company, which reacted by not allocating to the state the fee it collected from water bills for the repayment of the Mornos project. Moreover, administration offices and buildings and the municipalities often refrained from paying their water-use duties to EYDAP. In this way, the state and EYDAP were indebted one to the other with contested amounts.

As EYDAP and municipalities did not reach an agreement in all cases for a hand-over of networks, a provision was made for the supply of water in bulk quantities to the municipalities at a subsidised price. Decision on the expansion of supply to new municipalities and/or incorporation of networks became also a political decision, EYDAP having to follow the orders of the government whose decisions reflected more general political objectives and specific (electoral-driven) relationships with some municipalities. Detailed pre-expansion cost-benefit assessments were not taken; as a result EYDAP took over a number of problematic and costly networks.

The process towards privatisation: arguments and conflicts

The process

The process of regulatory change of Athens' water supply in Athens demonstrates that these changes were determined by the goal of privatisating EYDAP per se, rather than the other way round, i.e. privatization being considered as one among several options to achieve certain regulatory goals. Ideally, first the needs of a sustainable water supply system should have been analysed in order to design a supportive institutional framework, and then the most suitable organisational form should have been chosen for EYDAP.

With the Presidential Decree 139/22.4.92, EYDAP along with other public organizations, was removed from the control of the public sector. The model of privatisation that was promoted by the then government wanted the creation of a subsidiary company with the participation of a multinational "strategic investor". According to information that leaked to the press there was an intention for an agreement between the Government and British Thames Water Utility Ltd. EYDAP would maintain the 51-60% of the subsidiary's stocks but would be administrated by Thames, which would appoint the

General Director and the managers, have full control over the operation of the company (EYDAP information Source, 4, 3). Preparing the ground for privatisation, the government took a series of measures for the clarification of the situation with EYDAPs' finances. The debts of EYDAP to the Greek State from various loans were capitalized with an increase in the capital of the company and State's share. Furthermore, an increase of prices the same year did not only aim at the reduction of demand, as was argued by officials, but also "in order to increase the revenue and attractiveness of EYDAP (Apostolakis, 1999).

The view of Kaika (2000) is that the government took advantage, or even intentionally dramatized the water drought crisis (1990-1993) in order to prepare the ground for privatisation. The increase in prices, which the public would only accept in a crisis situation, greatly helped EYDAP become more attractive to private investors. Furthermore the water shortage crisis supported arguments of public "mismanagement" of water services, justifying calls for privatisation.

Law 2065/92 deducted from EYDAP the 3% tax it collected from new building constructions. The excuse was that this measure was "within the framework of solidarity to property developers for the reduction of construction costs and the revitalisation of the real-estate market" (EYDAP Source of Information, 9, 5). After removal of the tax, results in the annual balance of EYDAP were particularly negative (Apostolakis, 1999) supporting governments view that EYDAP had a deficit. The law however, planned for the tax to be substituted at a later time by another equivalent charge from the state budget, although it was not specified when this would be done. Therefore, while EYDAP appeared deficient in the short-term, justifying government plans for privatization, it could easily be turned into a profitable enterprise, when the building tax would be reconvened.

The privatisation program of the conservative government of the time met great opposition. The new social-democrats government in 1993 won the elections with the promise to modernize the economy, but without privatisation. Law 2414/1996 "for the modernization of public companies and organizations", defined EYDAP as a "public utility company" (PUC). Part of the so-called "modernization" programme for public utilities was the re-enforcement on management independence and the definition and regulation of precise relations with the State and consumers. The Law required that the Board of directors puts together a Strategic (10-20 years) and a midterm Master Plan (3-5 years), which would be approved by the Ministers of National Economy and MESPPW. The Master Plan ought to specify aims, time of implementation, means and actions and internal monitoring processes. It would form the basis for the "Management Contract" between the board of directors (BOD) and the two ministers for the duration of the term of the BOD. The contract included the monitoring of financial indicators and the company was obliged to produce an annual progress report. The law also set a fair and independent process for selecting the General Director of the Company, who would now concentrate most responsibilities in his/her hands. The composition of the BOD became more operational with the addition of specialised general managers. For the first time productivity incentives were allowed for the personnel. The scale of wages was liberated without interference though to existing employee contracts. Finally another novelty was the obligation of EYDAP to provide the MESPPW with a "Consumer Charter". The Charter describes a series of obligations from the part of EYDAP (e.g. minimum response time to written demands, response time for service problems) and defines

fines in cases of failure to meet these standards.

For critics, the PUCs Law was just a first, mild and "hidden" step towards privatisation, since it allowed the "change in the stock capital" of the companies and asked that the companies "operate with the rules of private economy" (Article 2). The president of EYDAP assured the staff that "the rumour that law was the first stage for privatisation", was false and unsubstantiated and misinterprets the spirit of the Law (Article in EYDAP Source of Information, June 1996, 4: 3). The government though, soon changed the – hesitant as far as privatisation was concerned - president of EYDAP. The new President did not hide that his main responsibility was the process of making available part of the stocks of the company to private shareholders. In his first interview in a newspaper, he advised Athenians to "drink without hesitation water from EYDAP and in the future also buy EYDAP" (Newspaper "Ta Nea", 26/05/98). The new General Manager had previous experience as head of the National Salt Industry which was privatised through a staged process of first making part of the company's shares available to private investors (Interview, January 1999, EYDAP Information Source, 13, 4). According to the press the positioning of a new president and the choice of a general Manager with relevant experience clearly stated the adoption by the Government of a "hard privatisation policy for EYDAP" (EYDAP Information Source, 12: 10) and the government's intention to "quickly introduce the company in the stock-exchange market" (Newspaper "Apogeumatini", 13/6/98).

The term 'equitisation' replaced this of 'privatisation'. Equitisation referred to the preservation of the majority control of the company from the State, but the disposition of either 'part of its shares..or new shares that resulted from the company's stock capital increase' in the stock-exchange market (Apostolakis, 1998:25) with the aim to 'draw capital without the need for subsidies from the State Budget and without needs for unfavourable loans from banks' (Interview of EYDAP's President Mr. Papavasileiou, September 1998, EYDAP Source of Information, 12:11). This conciliatory model between full privatization of assets and continuation of public control had already been in practice in other PUCs in Telecommunications and Electricity services. The companies were enlisted in the stock-exchange market and then a large (but minority) share of equity was sold to new dispersed shareholders. In this way, the State retained also the option to move in a next stage to moves that had caused much reaction in the past, i.e. sell its stock to a large shareholder that would take all control rights or form a strategic partnership and delegate management by selling a small part of its stock (Xenos et al, 2001).

The Hellenic Bank for Investments for Industrial Development (ETEVA), was contracted by the government as the consultant for the equtisation of EYDAP. The experience from different schemes of private sector participation in water services around the world was reviewed together with an analysis of the fiscal data of EYDAP. The conclusion was that the high fixed costs of EYDAP with their low return were rendering the company of low interest for investors. The proposal was against the equitisation of the full company, but for the establishment of a subsidiary, which would retain only the 'commercial part' of EYDAP. This would avoid problems in the assessment of the property assets and would remove the 'burden' of the non-profitable, low-return fixed assets (dams, channels, etc). The exact objective of the subsidiary was not defined but the intention was to focus on network operation and 'service delivery, provision of treated water and the collection

of customers' revenues and debts. renting the network from the State. buying refined water. and (operating according to a predefined) agreement on prices' (Interview of EYDAP President, op cited.: 12).

The model that was finally selected (see details in next chapter) did not opt for the establishment of a subsidiary company, but in the spirit of the above removed from the equitised EYDAP S.A. the fixed assets (reservoirs and aqueducts) and shifted them to the ownership of a newly established state organisation, 'EYDAP Fixed Assets Company' (EPEYDAP). EYDAP S.A. resumed the right for the operation and exploitation of the distribution network from Treatment Units to effluent discharge, for twenty years and as defined by the rules set in the Contract with the State.

The majority of EYDAP's shares remained under the ownership of the State with a minority package plus the increase of stock capital becoming available to private investors. As regards to the form of private participation, it was decided that shares should be traded in the stock exchange market so as to 'guarantee that there will be a wide dispersal, which would protect the company (and its public nature) from the control of foreign strategic investors' (Speech of General Manager of EYDAP to employees, September 13 1999, EYDAP Source of Information,17:16). However, the government was criticised that its choice did not stem from its intention to protect the company from foreign owners but from its wish to exploit the favourable conditions of the stock exchange market at the time which led to an overestimation of the value of most companies entering the market (between 1998-1999 the stock exchange index had increased by 300%. Indeed, in the initial public offering of the stock of EYDAP in December 1999 there were 104,661 applications registered demanding 248 million shares, for just 31.5 million available shares (Newspaper «Adesmeutos Tipos», 30/12/99). The first month of trading, EYDAP's share which was introduced with a 2,500 drachmas value reached 5,300 drachmas.

Although there were many reasons for the change of the regulatory framework of Athens' water supply, as there were many shortcomings in the operation of EYDAP in the past, the procedure was planned primarily as a response to the conditions dictated by the dominant financial and political climate at the time. The privatisation of EYDAP was promoted along with those of other PUCs as part of a programme for the 'modernisation' of the Greek economy. In most cases the equitisation 'model' was followed. The particularity of water resources and their distinctive environmental, technical and social-regional characteristics were not considered important in the design of the regulatory model. Indicatively, according to the General Manager of EYDAP 'most characteristics of EYDAP are similar to those of the petroleum sector .. which is a sector intensely competitive and which saw globalisation long before globalisation started affecting other sectors' (interview of the new President and General Manager, 2002, EYDAP Source of Information, 26, 6-8). Likewise, according to the Deputy Minister for National Finance there were no reasons why the government policy for EYDAP had to be any different than those in other privatisations. Answering to protests raised by Parliamentarians that water is a distinct good he responded that 'the canal of Korinth (another public venture that had been privatized) is not just cement either, but..a valuable historical and symbolic element' as also is the 'International Fair of Salonica, which has certain elements of historic character which have a uniqueness' (Parliamentary minutes, 28/09/99, 1191).

Arguments and counterarguments

According to critiques of equitisation, like the Trade Union of EYDAP, organisational weaknesses were already addressed by Law 2414 for PUCs and there was no need for the equitisation and partial privatization of the company. In their view, EYDAP did not have significant deficits other than those caused intentionally by the government by abolishing the 3% building tax and would be profitable if municipalities and public authorities were forced to respect their commitments and pay pending debts to EYDAP (Interview of the President of Workers Federation, EYDAP Source of Information, 2, 16). A crucial question is why did the option of equitisation prevailed over one of an administrative modernization of EYDAP as a PUC? The answer is enlightening to the "shadow dynamics" of the privatisation process.

A fundamental argument in favour of equitisation was the need for drawing private capital and investments 'since in order to reduce public debt for the accomplishment of EMU convergence criteria, the State could no longer finance EYDAP. The necessary infrastructure works require enormous amounts of money and if not privatised ... company borrowing will soar' (Speech of retiring Managing Director of EYDAP to employees in 1998, EYDAP Source of Information, 12:8). The reply to the question of 'who will finance' (the necessary investments) was 'simple and clear: the private sector' (General Manager of EYDAP; Xenos et al, 2001).

However, in the Contract accompanying the partial privatization of EYDAP, the State not only agreed to pay its debt to EYDAP but also committed to an annual subsidy of 44 MEuros per year for the next 3 years (as a compensation for the removal of the buildings' tax) (EYDAP, 1999). According to a financial plan for EYDAP that had been prepared prior to privatization by the English consultancy Knight Piesold, EYDAP could self-finance an ambitious investment programme for fifteen years, even if it remained a PUC, if only it increased tariffs to the levels of real cost and adjust them annually to inflation, together with a strict control of operational and personnel expenditures and with the assistance of a possible external loan to finance new infra-structure from an international credit establishment such as the European Investment Bank (EYDAP, 1996: 8, 9). The argument therefore that EYDAP could not survive financially without the support from private capital does not stand up against closer scrutiny. As explained later, private capital from the stock exchange market accounts only for a small part of EYDAP's investment needs. The greater share is sought through financing by the State or the E.U.

The government was accused of promoting EYDAP's equitisation as a short-term fiscal measure. Yet, as claimed in Parliament by the Deputy Minister of National Economy, the funds that the State received from the sale of the shares would be essentially returned to EYDAP through the three-year annual subsidy (note however that revenue from the sale of EYDAP's shares would be added to the state's budget of 1999, an important year for the judgment over the approval of Greece's entry in the EMU, while the obligations would be spread out over the next years). Even if such thoughts played a role, the main reason for the equitisation of EYDAP could not be simply the short-term artificial reduction of public deficit, since countries like Italy, with a large public deficit were accepted in the EMU.

Speaking to an audience of private investors the Managing Director of EYDAP was more honest and enlightening as to the logic behind the choice to go forward with equitisation: 'the principal advantage of gradual privatization through trading of shares in the stock market is the minimisation of the adjustment cost, that is the cost resulting due to the transition from the old status of a national and public corporation to a new private company.This cost can be very high and derail the whole process in a dead end'. Cost does not refer only to the financial cost but also to 'any possible reaction form employees, customers and suppliers .. The process of gradual privatisation provides the necessary time to each side to adapt to the new conditions.. and the necessary time to the government to decide on the final ownership structure of the company' (Xenos et al, 2001)

Therefore, the equitisation of EYDAP, despite proclamations for the opposite (see speech of Deputy minister of National Economy in the Parliament, 28/09/99) was an first stage in the –hesitant- political and financial programme of the government towards the complete privatisation of PUCs. The government was careful to avoid the acute social reactions that such a programme could raise, trying to even out consequences. The EU did not request the privatisation of EYDAP per sé. Asking however, for the 'convergence' of the Greek economy, it was pressing for the adoption of the internationally prevailing political and economic programme of reducing the public sector and 'liberating' the markets. The equitisation of EYDAP was only a small part of a broader government policy of adjusting to the requests of the European and international political and financial environment. As Bakker (1999) argues with respect to the privatisation of water services in England, the process of privatisation is first and foremost a political 'project'. It is based on a blind faith to its results rather than a careful assessment of its – difficult anyhow to predict and evaluate - results.

The equitisation of EYDAP reflects a general, although slow, course of Greek economy from the public to the private sector, and from state control towards the 'market'. The belief was that after the equitisation the company would become more independent from the State and that the 'supervision' of the shareholders would 'force' it to improve (Interview of Managing Director, EYDAP Source of Information 18,10) something that could not be done while it remained a PUC, despite the law's provisions. As a result, the equitisation of the company was a goal in its own sake and not the selected response to achieve a specific set of goals.

Responding to criticism for privatising a strategic, public resource, the government maintained that with the separation of fixed assets from privatized EYDAP 'the control of the state and the ownership of the natural resources and EYDAP's property assets were secured' (preamble in Parliament, Session ΛΘ΄, 28/09/99,1181). The State, the argument was, maintained in this way national resources of 'strategic importance' and was ensuring that no private interest could act opportunistically on these property assets 'of major importance for the country' (Xenos et al, 2001). This justification though, is not convincing since the State could tailor regulation so as to maintain the ownership of the 'water resources', by licensing and setting terms on their use, while leaving the fixed assets (dams, pumping-stations) to the ownership of EYDAP. The reason behind the transfer of the assets was a logistical one and had to do with the proposal of ETEVA that EYDAP with the fixed assets under its possession would not be 'attractive' for investors. According to the managing director of EYDAP 'before privatization .. due to

the calculation of reservoirs in the fixed assets of the company .. capital return was small .. and though satisfactory for a public corporation.. it was too low compared with other industrial sectors.. and clearly not acceptable for a private company' (Xenos et al, 2001). Presenting EYDAP S.A. to institutional investors, the President of the company asserted the attractiveness of its share since 'all of you who are familiar with financial procedures (know that by) transferring the fixed assets to the newly established public entity we have a reformed, lighter budget.. with smaller amortisation.. and therefore more profits' (EYDAP Source of Information, 18:14).

The legal framework was not deigned with water resource management in mind. The issue was how to secure the success of the equitisation (which was supposed that in turn would lead to an improvement in the performance of EYDAP in all areas, including resource management). As it will be argued though in the ninth chapter, the separation of the reservoirs from EYDAP S.A. and the guarantee the State provided of securing treated water to EYDAP may contribute to the financial viability of EYDAP S.A and its attractiveness in the stock market, but it poses important dis-incentives against a careful, long-term-wise control of water consumption.

The new legal framework and the new EYDAP Ltd

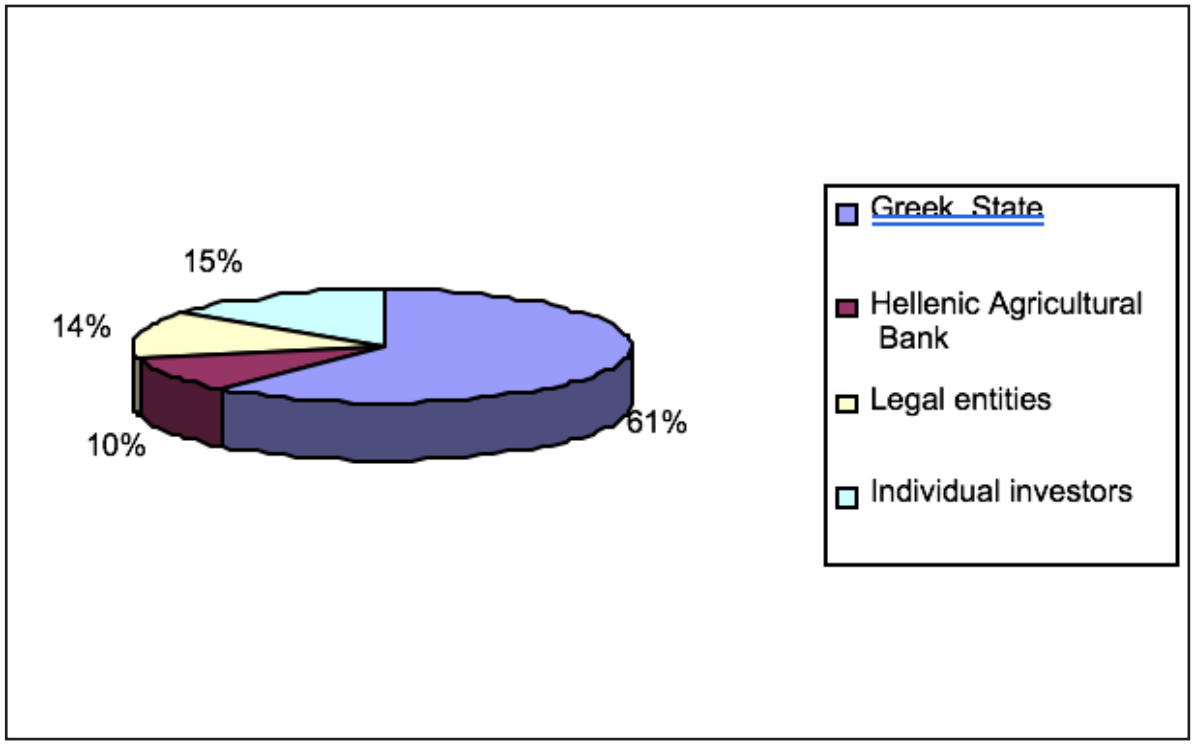
The new regime

The new legal framework for water supply in Athens is defined in law 2744/1999 on the "regulation of EYDAP issues" (Government Journal 222A, 25/10/99, 4307-4316) and by the Contract between the Greek State and EYDAP in December 9th 1999.

EYDAP S.A., a Limited Liability Company of private law, was separated from EYDAP Fixed Assets (EPEYDAP), a public enterprise operating under public law. EYDAP was given the exclusive right of providing water and sewage services to the area of its jurisdiction for a period of twenty years, under the terms of the Contract with the State. Property assets of the company are those fixed assets that remain under its ownership. These include the Water Treatment Units, the water-sewage networks and the Sewage Treatment Units. Reservoirs, aqueducts, boreholes and pumping-stations passed under the ownership of EPEYDAP.

The State can make available to private investors up to 49% of the total stock capital of EYDAP. Chart No 13 shows the composition of the shareholders of EYDAP in 2001.

Chart No 13: Shareholders



Source: EYDAP, 2002.

Rights and responsibilities

With the new regulating framework the spectrum of activities in which EYDAP can operate was expanded significantly.

1. The procedure for the expansion of EYDAP to other regions beyond its geographical jurisdiction was simplified. Instead of the previously required presidential decree, a direct agreement between EYDAP and the local authority was enough, under the clause of approval from the Ministers of National Economy, Internal Affairs and ESPPW. According to a common decision of the aforementioned ministers the activity of EYDAP could extend to whole geographical areas beyond the region of Attica (Article 2).

2. EYDAP is no longer restricted to water and sewage services (as it was before), but can provide technical and consulting services, it can establish companies or co-operatives, or participate in them, 'within Greece or abroad', as well as undertake any commercial or other activity directly or indirectly connected with its cause (Article 1).

With this regulation EYDAP is 'liberated' from the previous geographical and service boundaries of its jurisdiction, since it can extend either the direct (water supply) or the indirect (studies, technical support) activity further than Attica- and in the second case beyond Greece- while it can also participate in 'multi-utility services of public importance', providing also other than water and sewerage services. This comes under the clause that 'the ability to finance its running obligations is not negatively influenced' (Article 1). There are no specific rules or criteria however to assess the above.

The mutual responsibilities of State and EYDAP are determined in the Contract (EYDAP, 1999). The State has the responsibility of supplying raw water to EYDAP and to partly finance its investment programme. On the other hand, EYDAP has the responsibility for the installation and operation of the fixed assets of the distribution network as defined in the Charter for 'operation regulation of the water-supply network of EYDAP' (Government Journal 52B, 1/2/84) and for the provision of services to consumers according to the 'Consumer Charter'. The company is obliged to comply with all existing legal regulations including quality standards for drinking water as these are defined by legislation and to apply all standard water sector practices and methods.

According to the Contract, EYDAP should execute an 8-year investment programme (Table No 8).

Table No 8: Investment Plan 2000-2008 in Million GRD (1 Euro= 340 GRD)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total
Treatment	-	-	-	-	-	-	-	-	-	-
Upgrading Treatment Plants	100	100	4,601	2,558	830	0	0	0	0	8,189
Distribution		-	-	-	-	-	-	-	-	-
Network Expansion	4,928	5,625	4,000	3,635	3,690	2,400	2,100	2,100	2,100	30,578
Network Replacement /renewal	2,713	4,000	3,000	4,500	3,973	4,000	7,649	8,000	8,000	45,835
Extension of existing networks	1,910	650	1,700	1,700	1,700	1,500	1,500	1,500	1,500	13,660
Storage reservoirs / pump stations	2,610	5,411	3,398	3,026	2,900	2,968	3,225	3,739	3,676	30,953
Meters replacement	800	800	700	700	700	700	700	700	700	6,500
Losses reduction	748	845	730	730	730	730	730	730	730	6,703
Other investments	800	800	800	800	600	600	600	600	600	6,200
Small scale works	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	18,000
Distribution total	16,509	20,131	16,328	17,091	16,293	14,898	18,504	19,369	19,306	156,519
Capital investments	7,680	7,023	6,371	6,180	1,950	900	900	900	900	32,804
Sewage	7,940	16,020	25,101	26,009	21,494	20,272	17,200	8,959	8,817	151,812
Waste-water treatment	6,797	10,783	6,809	6,898	8,477	9,957	9,386	3,565	2,244	64,916
Total	39,876	54,057	59,210	58,736	49,044	46,027	45,990	32,793	31,267	417,000

Source: EYDAP, 1999.

Economic regulation

Economic relations

With the new law the financial relations between EYDAP and the State got clearer. The debts that the State owed to EYDAP from the removal of the 3% buildings' tax were offset by the pending debts of EYDAP from past loans. A difference emerged in favour of EYDAP (35.8 MEuros) but was found as equal (sic.) with an obligation of EYDAP that emerged after a new tax check of the period 1989-1998 (EYDAP, 1999).

The State undertook the duty to pay EYDAP for the three first years after the equitisation (1999-2001) with 44 MEuros per year, as a compensation for the 3% tax. Moreover it guaranteed the subsidisation of EYDAP's investment programme for the period 2000-2008 'either through Community resources or through the Public Investment Programme'. The law refers to, rather vaguely, that the subsidies 'cannot be greater than 60% of the investment programme' (Article 7) but in the contract it is defined exactly that the amount 'will reach a total of 60% of total capital investments of EYDAP .. and will not be greater than 735.3 MEuros' (Annex 4 of the Contract).

EYDAP is liberated from its duty to carry out the non-profitable stormwater and flood defence works. It can be contracted however to carry them out as any other private entity by MESPPW.

As for the debts from municipalities, favourable incentives were introduced to speed up reimbursement (exemption of municipalities from added charges for the lump sum payment). In the case of persistent non-payment, EYDAP could collect the debts directly from the Deposit and Loans Fund, with direct deduction of the amount from the respective Local Authorities financing by the State (Article 7).

Regulation

The new legal framework does not provide for the establishment of a specific authority assigned with the regulation and monitoring of the contract terms. A previous draft of the law, which had leaked just a month before the publication of the final text (Newspaper 'To Kiriakatiko Vima', 22/08/99), was establishing a 'National Committee for the Management of Water and Waste' (EEDYA). The Committee's responsibility would have been to issue licenses for new public-private water companies throughout Greece, to inspect and control the commitment to contractual terms and the recommendation for emergency measures whenever needed, in addition to consultation on relevant questions/requests put forward by ministers in charge. The framework, planned for the authorisation of licenses, was almost identical in structure to the eventual contract between State and EYDAP. The 'National Committee" would also have the responsibility of determining the water tariffs. In the end, the 'National Committee' was not established, possibly due to the concerns of the government that ot could be accused of pushing forward a liberalisation of water services throughout the country. According to some sources, the initial thought of the government was that EYDAP could constitute the basic shareholder of new private-public co-operatives that would take up the water supply

of municipalities all over Greece (Newspaper 'To Ethnos', 21/08/99). The model of the EYDAP-State Contract has already been applied for the equitisation of the Municipal Water and Sewage Company of Salonica (Newspaper "Ta Nea", 13/10/00).

Another possible reason for rejecting the establishment of a regulatory authority is possible the additional bureaucratic and fiscal costs. The supervision of contractual commitments of EYDAP was possibly thought of as unnecessary for the time being as the State remains the principal shareholder of EYDAP. Thus the EYDAP-State Contract is essentially regulated by the court, to which the contracting parties can turn to resolve any violations of the agreed terms (Xenos et al, 2001b). In the case of technical disagreements, the expert opinion of an engineer appointed by the Technical Chamber of Greece is required, while for economic disagreements a chartered accountant from the Chartered Accountants Association is foreseen. EYDAP is expected to submit periodic reports to the Minister in charge (MESPPW) with annual results on specific performance indicators, a fixed assets record. In addition, EYDAP should publicise an abstract of the annual edition for the consumers. Performance indicators include data on "un accounted for water", "number of properties that are under the risk of low water pressure", "areas or streets subject to unscheduled supply cuts of a 12-hour duration or more", "number of properties subject to flood risk", "number of enquiries that did not get a response within the declared number of working days", "number of written complains that did not get a response within 15, 30 and over 30 days", "number of received phone calls that did not get a response within the declared number of minutes" and "population subject to restriction of use". The responsibility of assessing the performance and the adherence to the contract terms belongs to the State, i.e. the MESPPW and the Ministry of National Economy. There is not however a specific authority, administration or department delegated the duty to conduct this assessment.

Pricing

Water supply tariffs are to be determined every five years "within the scope of governmental policy as to ensure a reasonable return of EYDAP's investments and the financing of its activities in a rational way" (Article 3). By reasonable return the possibility of profit yield to the company through the tariffs mechanism is established. Both the Ministers of ESPPW and National Economy decide one the levels of the tariffs after taking into account the proposal from the board of directors of EYDAP. The new prices were determined in 2000 for a five-year period, with the anticipation of an annual adjustment to the preceding year's inflation.

The contract also stipulates the formation of a category of "protected customers", referring to economically weak groups of customers, subject to "special treatment" regarding "potential water supply cuts". The definition of the group and the special treatment will be defined according to decisions of the board of directors of EYDAP and with the approval of the Minister for ESPPW (Article14).

Waterworks and resource management

Under the new legal framework, the State retains the sole responsibility for the water resources and the water conveyance system. The dams and reservoirs of Marathon Lake, Mornos and Evinos River and the works and installations in Yliki Lake, the groundwater boreholes and the aqueducts, along with their high amortisation costs, passed on to EPEYDAP. The total or part of the operation of these assets and the necessary maintenance works can be carried out by EYDAP for a reasonable payment by the State. The regulation regarding aqueducts consisted of an accounting trick. Logistically EYDAP was relieved from the high cost of the aqueducts amortisation by transferring them (as allowed by the law) to EPEYDAP. However, the law also allowed for "EYDAP to be responsible.. exceptionally for the operation and maintenance of the aqueducts .. if it requests to take up their operation and maintenance on the company's expense" (Article 6). Thus, EYDAP maintained the responsibility and the cost of operating the aqueducts as well as that for accomplishing the works in progress in the aqueducts (funded by the EU Cohesion Fund, for a total amount of 125,3 MEuros), without however the aqueducts being counted in EYDAP's fixed assets. In a second logistic trick, the cost for EYDAP of operating and maintaining EPEYDAP's fixed assets (reservoirs, aqueducts) was found as equal (sic.) with a charge it was supposed to the latter for the supply of raw water. Thus, while in practice there was no shift in operational responsibilities, EYDAP was logistically relieved from big assets and pending loans.

The State through MESPPW retains the responsibility for the "study, construction and operation of new, and for the operation, maintenance and expansion of existing" water supply works for the needs of Athens. The Ministry for Development was entrusted with the study and collection of water (Article 6). It is the responsibility of the State to supply EYDAP with raw water "as to ensure the reasonable consumption on behalf of the consumers of EYDAP" (Article 6). Raw water must meet the quality standards of the A2 category as defined in EU regulation (Article 15-1c of the Contract). The price of the raw water is determined upon a "written agreement between the two parts, depending on the cost of maintenance and operation of the fixed assets and in connection with the government's tariff policy and definitely taking into account the price of raw water provision from EYDAP to third parties" (Article 15-1a of the Contract). As mentioned above, for the first five years, the price of the unrefined water is compensated with the cost of the services that EYDAP offers for the maintenance and operation of the fixed assets belonging to EPEYDAP and the cost of the annual operation of EPEYDAP.

In the case that additional water abstractions will be necessary from those available from the Mornos, Evinos and Marathon reservoirs, EYDAP is entitled an additional compensation from the State, corresponding to additional the cost of operation resulting from the increased energy consumption.

EYDAP's obligations regarding the management of the water resources are defined in the Contract. First of all, EYDAP has the obligation to draft a five-year plan for the management of the available water resources and the water supply network and to submit it for approval to the Minister of ESPPW. The use by EYDAP of the costlier Yliki Lake branch and the groundwater boreholes, and its duration, is to be determined according to this Resource Management Plan.

It is also the responsibility of EYDAP to keep "unaccounted for water" of the network within predefined upper limits. These are defined according to a gradual long-term programme for the reduction of leakages from the "existing real losses" (as in 1999) up to the "economic level of leakage" by 2014. The above technical definitions are to be agreed upon by EYDAP and the State. In the case of exceeding the intermediate annual limits, a fine of 6 Euros per 1,000 m^3 of lost water is foreseen. In the case of achieving the goals, the State commits to provide to EYDAP a quantity of raw water, equal to the quantity saved by reducing the losses, for free (Contract, Annex 1). The results and the progress in the reduction of losses should be included in the annual report to MESPPW and consumers.

The water resources legal framework

The Greek common law defines riparian water use rights. Water-use rights however have been traditionally unclear and a source of conflict. Land property rights in Greece after liberation from Ottoman rule (1830) have been notoriously contested (especially with regard to public lands vs. individuals' claims). Conflicts have also arisen around shared water resources and interconnected hydrological systems (esp. groundwater). Until 1987, water abstraction did not require a license nor was there a register of water uses. The State retained the right to expropriate land and water resources for waterworks of "public importance" and to assign them to specific uses/users. This led to a complex and fragmented series of laws regulating different uses (urban, agricultural and industrial) or specific water bodies / waterworks. Athens' and EYDAP's waterworks (river reservoirs) were conducted in this way, the State first expropriating land, then building the reservoir and assigning its use (by law or decree) to EYDAP.

In 1987, the Government with Framework law 1739/1987 "for water resource management" attempted to put an end to this situation (YBET, 1988). The law assigned the responsibility for licensing and allocation of water resources to the State. Although water property remains riparian, the State partly controls water use as it resumed the responsibility for licensing new water uses.

The concept behind the 1987 law is that water is a unified resource and its best allocation in competitive uses (including the environment) requires that the responsible parties and users are coordinated at a national and regional level. The law created 14 water districts with corresponding Regional Water Departments. Their responsibility was the creation of long term plans for the allocation of the available water resources within the district according to the "needs" of the competing uses and the planning of the necessary actions for their "exploitation". In national level and for projects of significant importance, an Interministerial Committee was set up, comprising of the Minister for Development, supervising ministry for the management of water resources in the country, along with the ministries of ESPPW, Internal Affairs, National Economy and Agriculture. At a regional level the Law required User Assembles consisting of representatives from regional, prefectoral and municipal authorities as well as the Technical Chamber of Greece and agricultural co-operatives.

According to the law, it was the duty of regional authorities or the respective ministries governing specific uses, to issue lisences for new abstractions or for new hydraulic projects. An exemption was foreseen for water companies, which needed only an agreement of the Interministerial Committee. In theory the licences should take into consideration the regional management plans, which allocate resources to different needs. Plans and decisions must take care of the "needs" of the aquatic ecosystems, which according to the law, precede all other uses.

The law constituted a "framework" and the specific provisions (e.g. the content and the plans' drafting procedure, the definition of ecological needs etc) were to be specified in a series of Presidential decrees or governmental decisions.

The law actually did not influence the regulation of the water resources management of Athens, reflecting a broader failure with the enforcement of the law so far. Implementation of the Ministerial decisions and presidential decrees necessary for enactment of certain provisions was delayed. The drafting of a national plan and the approval of the regional management plans are also still pending. With a more recent Law, the regional water departments, initially foreseen as autonomous units operating at the river basin level, were incorporated within existing regional administration structures. The process of establishing the Regional Water Departments was complete just recently. Existing authorities are understaffed (often with unqualified personnel) and have restricted duties (YPAN, 1996, OECD, 2000). Administrative plans have been proposed for ten out of the fourteen water districts (OECD, 2000). However, these plans do not constitute a real regional planning since they were not prepared by the regional authorities themselves but were set up centrally by a team of specialists from the National Technical University on behalf of the Ministry for Development. The plans consist of rough water balances of supply and demand for every c district (Ministry for Development, 1996). "Needs" (e.g. for irrigation) are taken as granted (e.g. based on land reclamation plans of the Ministry of Agriculture) and are not subject to planning. In the plans there is no reference to the needs of the ecosystem, probably due to lack of data since their drafting was based on a review of the already available information. Despite the approval of the presidential decree for establishing minimum environmental flows, this has not happened (save for standards set though Environmental Impact Studies of new projects).

The licensing system has had a limited effect on the control of large uses and projects, since in effect, the same ministries responsible to issue the licenses for the projects are in most cases the ones that carry also the projects themselves (!) in the absence of binding regional water plans. For example, the Ministry of Agriculture is planning, authorising and carrying out the hydraulic projects for irrigation while it is also responsible for their funding. Likewise, the MESPPW, is responsible both for planning and constructing new the new water projects for Athens as well as issuing the necesary licenses subject to an agreement by the Inter-Ministerial Committee. The water supply system of Athens was exempted from the regional water plans of Western and Eastern Sterea Ellada as the reservoirs were allocated for the use of Athens exclusively (Ministry for Development, 1996). In practice therefore, Athens water demand and abstraction policies remain beyond any external control or licensing scheme.

As for the smaller abstractions, the licensing system functions satisfactorily, but controls only the new and not the older extractions, which make up the majority of

the existing uses. The licenses may state the upper extraction limits but there are problems since there is no control and penalising mechanisms for violations (Ministry for Development, 1996). Upper and lower limits have been established with presidential decrees for different uses, but without any effect on real decisions.

Although the pricing of water in different uses has been enforced by a presidential decree, no user in Greece pays for raw water (OECD, 2000).

Environmental and health regulation

EYDAP operates within the rules of the legal framework governing drinking water quality and environmental protection. Before the adoption of European Community law, there was no specific legal framework for the quality of water resources, even for those destined for human consumption. Athens' water sources were separately regulated with Ministerial Decision A5/2280 in 1983, which defined specific rules for the protection of the quality of Marathon, Yliki and Mornos from pollution. The law set a minimum distance of 1.5 km for any human activity from the city's reservoirs, prohibited the direct disposal of waste to the lakes or in their basin and set zoning and controlling rules for all types of activities, such as installation of industries, construction of buildings, use of sewerage pits, etc.

The entry of Greece into the European Common Market (1980) led to a drastic reform of the national environmental legislation. Ministerial Decisions 46399/1352 and A5/5180 in 1986 implemented the EC directives for drinking water quality (75/440) and for the quality of surface waters intended for drinking (80/778). The quality of Athens' water sources qualified easily for the existing level of treatment (A2) and for the drinking water standards, though the new EU legislation provided an impetus for a modernization of the monitoring and reporting systems.

Directives (76/160) for the quality of bathing waters and 91/271 for the level of urban waste water treatment had also an important impact and led to the decision to build the first waste-water treatment plant of the city in Psytalia (sewerage was previously discharged untreated to the Gulf of Saronikos).

Law 1560/1986 provided the first framework law for the environment; a requirement relevant to the water sector of the city of Athens included the provision for Environmental Impact Statements for all new infrastructure projects, including water works.

Water governance

Charts No 14 and 15 depict graphically the water governance structure in Athens in the period before the partial privatisation of EYDAP and after (Chart No 15 shows only changes relative to Chart No 14).

Regulatory roles were exposed in the previous sections. Briefly, the Ministry of Environment, Spatial Planning and Pubic Works (MESSPW) has the responsibility for Athens' water supply. Water resource planning at a national and regional level, albeit inactive, rests to the Ministry of Development. The Ministry of Finance has the responsibility for the programme for the modernisation of public utilities and thus EYDAP. MESSPW has also the responsibility for environmental regulation (EIS, water quality) and reporting to the European Commission. This responsibility lies to the General directorate for Environment of the Ministry in contrast to the oversee of EYDAP which lies to the directorate for Public Works.

The Greek political bureaucratic system is highly centralised, most responsibilities concentrated at the central government level. MESSPW has had a central role in all matters relating to EYDAP (pricing, financing, planning and construction of water works), whereas the process towards privatisation has been driven solely by the Ministry of Finance.

The Hellenic Technical Chamber (TEE), the formal professional association of qualified engineers, has an institutionalised (by law) role in decisions and design for all public works of national importance (including Athens' water works). Its representatives played a central role in the design to the response of the city's drought in 1990-1993. TEE and more generally the construction industry has traditionally a very powerful political role, given the importance of the construction sector for Greece's economy. In many ways, this has lead to a waterworks-driven approach to water resource management. Engineers from universities and consultancies dominate scientific analysis for water resource management. Their expertise concentrates mainly on hydrology and hydraulic engineering. Water issues have seldom been approached from a social science perspective and even economic theory has played a very limited role in water resource management, other than the general discussion for the privatisation of public utilities in general. Engineers from universities and consultancies are often inter-related with the – powerful – construction industry interests benefiting from new hydraulic works (Kaika, 1999, Kallis, 2003). The same persons have occupied positions in the directorates of EYDAP and TEE, the National Technical University and consultancies or construction companies (Kallis, 2003). The notion of an "iron", "hydraulic community" (del Moral et al., 2000) describes more or less accurately water governance in Greece.

Chart No 14: Water governance in the statist era

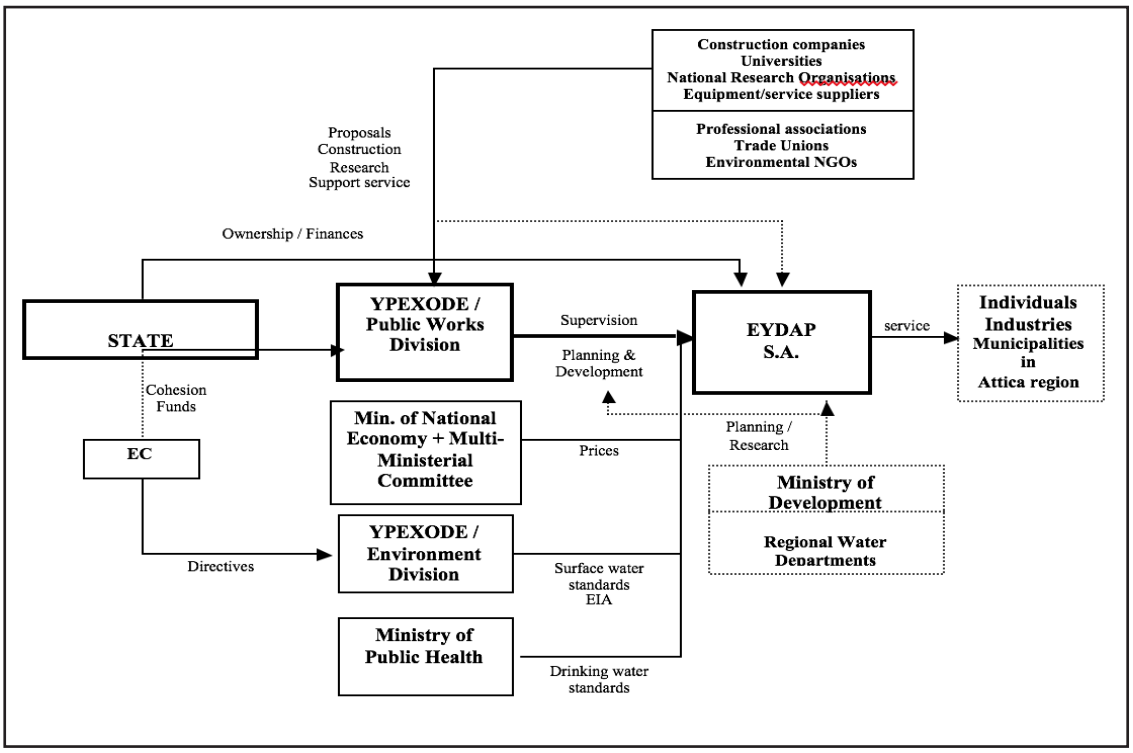
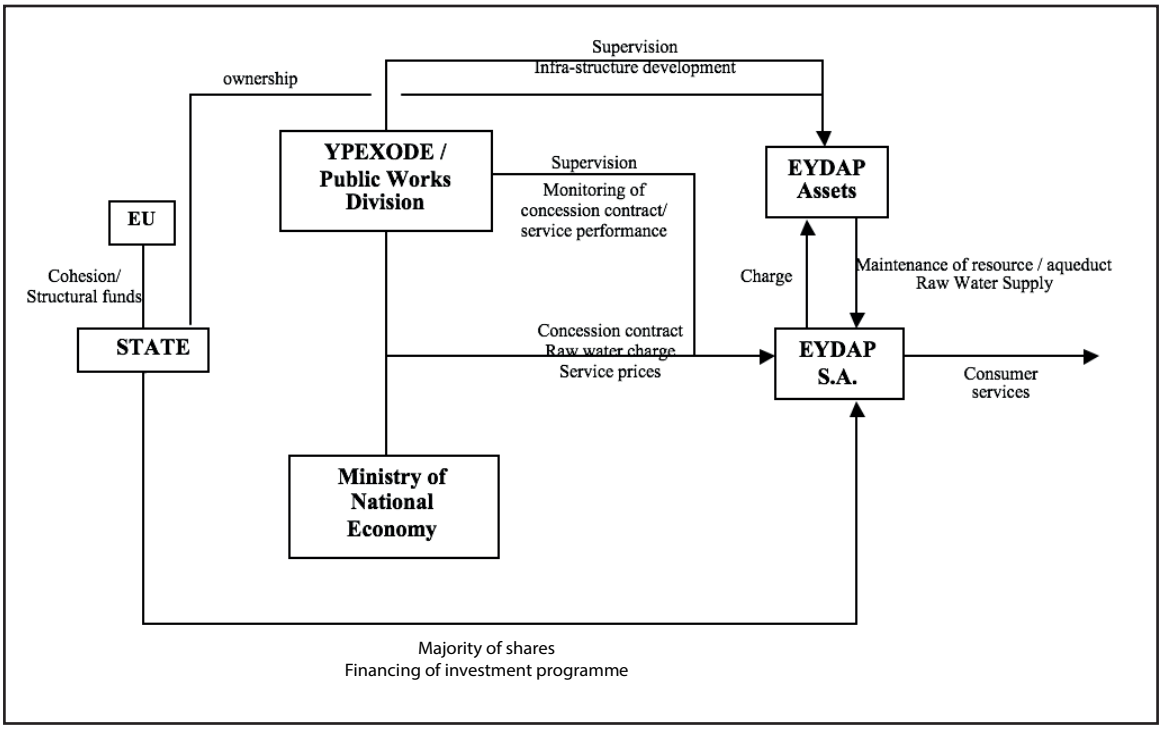


Chart No 15: Changes in water governance after the partial privatisation of EYDAP



Around the dominant, waterworks-driven paradigm, there is a broad social consensus between:

- the State, which providing drinking water and infra-structure at a subsidized cost and supporting Athens' urbanization substitutes for the lack of real developmental and social policy,
- Athenians, whose cost of living and housing is maintained low by the low-cost and subsidised provision of basic services
- The regional communities from where the resources are transferred and who, at least until recently, were content with the positive developmental side-effects from the works (e.g. construction of roads) or the (direct and indirect) compensations given by the State,
- The construction sector, dominating the Greek economy, which benefits both from the maintenance of the urbanization pace of the city and from hydraulic works.

"Clientelism" and "favourism" are strong in all facets of Greek pubic life (Leontidou, 1997) and public construction works, prominent among which have been waterworks (including those of Athens) have been ridden with accusations for interests' favourism and economic scandals (Kaika, 1999, Kallis, 2003).

Reactions from environmental organizations and more recently some regional communities, or the accusations for mishandling of public money in the way hydraulic works are contracted and conducted, remain marginal in a context where key decisions are taken under the pressure of an imminent crisis (droughts). From this perspective, the postponement of decisions until a drought appears is not only a case of accidental mismanagement, but instrumental to the continuation of the dominant expansionist paradigm (Kaika, 1999). Environmental NGOs have only a marginal role and have little social support. Local and regional authorities are politically and financially powerless. During the drought, there was for the first time a fierce reaction from local communities and local NGOs against plans of the government for an – unwarranted – additional transfer of water from the eastern basins of Greece to Athens. The local authorities, however, did not react to the environmental and local impacts per se, but asked for compensatory investments from the government for local infra-structure (e.g. new highways, connection to the national highway grid, local irrigation waterworks).

One might argue that there is limited awareness of the environmental dimension of water management in the Greek society relatively to other western societies. Partly, this might be related to the lack of enjoyment practices of inland waters, most recreational activities concentrated in the coastal zone of Greece and the sea, for which environmental awareness is higher.

A different set of "actors" was active in the discussion for the privatisation of EYDAP. The "policy arena" in which the institutional change of Athens' water supply service was planned, was that of "national economic policy" (programme of privatizations). The ministry responsible for EYDAP's law was the Ministry of National Economy and not

the supervising MESPPW. Indicatively, MESPPW was not even present in parliament during the discussion of the bill (Parliamentary Minutes, 28/09/00, 1182). Throughout the planning process of the "privatisations", the Ministry of National Economy was supported technically from several management and investment consultancies or banks (such as ETEVA or the British bank Rothschild).

The policy network around regulatory change, although completely different from this of hydraulic works, was equally "closed". The equitisation of EYDAP was planned by the Ministry of National Economy, the consultants (ETEVA) and an "Official Committee" composed of "high ranking executives" of EYDAP, which officially was following the study by ETEVA, but essentially headed the preparation for "privatisation". In this way the Board of Directors, in which local authorities and employees' representatives participated, was sidelined from information and discussion over privatization plans. Likewise the common procedure for notification and discussion of new laws that affect employment relations with a Financial and Social Control Committee in which several civic bodies participate was also sidelined (EYDAP, Source of Information, 13, 6). The government was criticized for the lack of dialogue with Trade Unions and local authorities and for the lack of transparency, since the plans for the EYDAP privatisation only became known "from the news agencies (when) the block of measures regarding EMU converngence were announced by the Minister of National Economy at Brussels".

The decision to place EYDAP in the stock market did not face strong reactions from the society. In contrast to the experience in other countries (e.g. Latin America), water services are relatively unproblematised in Athens. Service has been universal, water quality good (due to the recourse to the mountainous resources of Mornos) and prices maintained relatively low. Privatisation was not followed by a significant change of prices. This might partly explain the "low profile" in mass media and in public debate on the discussion for the privatisation of EYDAP.

The Trade Union of EYDAP was the only organisation that strongly resisted equitisation. Its position was in favour of the company's "modernization", but without private capital participation. Even though the syndicate was threatening with intense mobilisations and started up a campaign with broadcasts in national radio and television, it had lost its previous strength and resonance to the company's employees (see editorial article EYDAP Source of Information, 4, 10-11). The participation of the staff in the last strike was just 9%. The president of the Union recognised the breakdown of the union movement (Interview with the President of EYDAP's Trade Union, EYDAP Source of Information, 12, 15-18). The management of EYDAP offered to employees company shares in privileged prices (20% lower than official prices), while an amount of the State's revenue from the shares would be offered to the employees' pension fund (EYDAP, 1999).

Nonetheless, compared to other public services' equitisations, the one of EYDAP generated the most intense political reactions. All political parties of the opposition (conservative and communist) stood against the bill, while many parliamentarians from the governing (social-democratic) party in an exceptional move defected from party line and voted against the equitisation of EYDAP. The bill was finally approved with a slim majority (Newspaper "Ta Nea", 22/09/99).

The government took had taken advantage of the circumstances to avoid social reaction. The bill was presented in the days immediately after the great earthquakes in Athens and while the employees of EYDAP were burdened with emergency works to correct damages in the network. At these times, a strike was out of the question and the law did not get much attention from the general public. The bill was discussed in the summer session of the parliament, where discussion time is limited and fewer parliamentarians vote.

Many of the critical arguments in the parliamentary discussion of the bill for the privatisation, were focused on the special nature of water as a "strategic" "common" good. The government, however, at least at the level of discourse, did not argue against the public and strategic dimension of water services. The argument was that by keeping the ownership of resources and majority ownership of EYDAP (more so avoiding to delegate management to foreigners but distributing private "ownership" to small, individuals shareholders) these were safeguarded, while increased private participation would increase financing opportunities and efficiency in the achievement of the public/ strategic goals.

Part B – Assessment of findings

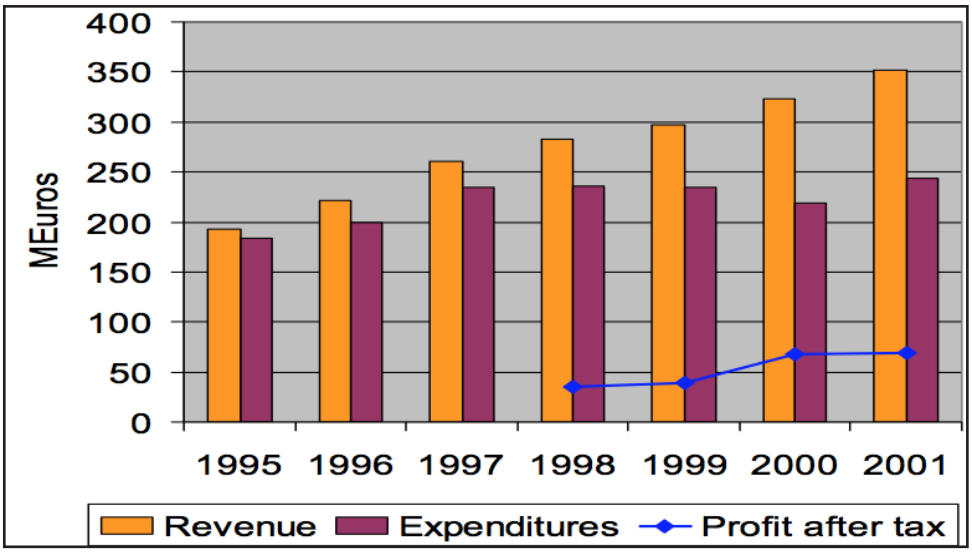
Economic and Financial Performance

The economic situation of EYDAP after partial privatisation

The improvement of the official financial data of EYDAP S.A. after equitisation (1998) was impressive. The profits of EYDAP, which were already positive from 1992 (due to the capitalization of its debts and the increase of prices), increased substantially after the adjustments brought by the new legal framework (Chart No 16).

A first observation is the continuous increase of the revenues from water services (Table No 9). The increase of water consumption by 21.1% between 1998 and 2000 was primarily due to the rise of the quantity of water consumed (by 15.3%) and secondarily due to the increase of the revenue per unit of water consumed (not so much due to the increase of rates per rate, since the only substantial increase was in municipal rates, but due to the fact that high-rate consumption increased) (EYDAP, 2001). The major economic indicators of EYDAP (profit margin and capital return) demonstrated impressive improvement after the equitisation (the margin for net profit increased from 13.2% in 1996 to 37.5% in 2001) and the return on capital (assets) from 2% to 14.8% respectively. As for the municipal debts, these decreased by 43% in 2000 (-13.2 MEuros). As a consequence of the excellent results, EYDAP yielded dividends of 13 Eurocents per share in 1999, 21 Eurocents per share in 2000 and 22 Eurocents per share in 2001. The total amount of share dividend for the period 1999-2001 reached 59.4 MEuros.

Chart No 16: Revenue–Expenditure and profit EYDAP, 1995-2001



Source: Xenos et al., 2001b, Annual Bulletin EYDAP, 2001, 2002)

However, "all that glitters is not gold". The General Manager of EYDAP may have presented the improvement in the financial position of the company as a result of the "privatisation" (Xenos et al, 2001), but reality is much more complex.

1. The improvement in returns on assets was not so much the result of actual improvements in productivity, as to the logistical transfer of the major fixed assets of EYDAP to the State (EPEYDAP). The ownership value of these fixed assets was estimated at 873 MEuros in 1999 and their non depreciated value at 659 MEuros (EYDAP, 2001). The result of transferring these assets was the substantial reduction of the total cost for amortisation of EYDAP, a reduction that reached 20 MEuros in 2000, contributing to the reduction of the company depreciation costs (Table No 8). This cost of course did not "disappear" but was transferred to the State.

2. A second observation concerns the considerable annual subsidy, in replacement of the building tax of 3%, which EYDAP received for the period 1998-2000 (44 MEuros per year), included in the "other revenue" category (Table No 9). Without this subsidy, which according to the terms of the Contract stopped in 2002, and without a change in the method of revenue calculation for 2001, "the profit before tax in 2001 would have been 41 MEuros from 60 MEuros in 2000 and the net profit margin would have been 15.37%" (EYDAP, 2002). The total profit as well as the profit margin would have been around pre-equitisation levels.

The above observations recall some of the issues that had been raised by the critics of the equitisation (see Parliamentary proceedings, 28/09/99) concerning the justification of a continuous subsidisation from the State of a - partially private - company, which allocates dividends from its earnings to private investors. Without the subsidy and the transfer of the fixed assets, the dividend to the shareholders would be much smaller. This subsidization might have been justifiable before privatisation, when EYDAP was public, but it becomes questionable after the partial privatisation.

Another observation, which is investigated further in chapter nine, relates to the fact that the sustenance of an increasing revenue based on an increase of consumption (increase of water demand, reflected both in revenue from water supply and from sewerage – see Table No 9) entails a considerable "external" cost, since in the long-term it increases the chance for utilizing the energy-expensive sources and/or building new water works.

If the goal therefore is not just the financial appearance of EYDAP S.A. but the broader economic well-being of the water sector, it is questionable whether equitisation has brought improvements.

Table No 9: Revenue and costs by category in MEuros

	1998	1999	2000	2001
Revenue from water supply	169	177	198	217
Revenue from sewerage	50	52	59	71
Other revenue (incl. state annual subsidy 1998-2001)	42	49	49	49
Other revenue	16	15	9	10
Interests	5	4	8	5
Total revenue	283	297	323	352
Sales' costs	113	118	118	131
General expenditure	59	64	69	76
Special costs	15	6	6	9
Interest rates	5	3	2	1
Depreciation costs	44	44	24	27
Gross costs	236	235	219	244
Profit pro tax	47	62	104	108
Taxes	12	23	36	39
Net profit	35	39	68	69

Source: EYDAP, 2001, 2002.

Investment and Financing

The investment programme (Table No 8) foresaw investments of 117,3 MEuros within 2000, which would be covered by:

- the increase of share capital (41,2 MEuros);
- financing from the State via the Community Support Framework (CSF) or if not, from the National Programme for Public Investments (PPI) (70,3 MEuros);
- from the capital stock of EYDAP itself.

Although the General Accounts Office of the State anticipated an "undefined" expenditure from PPI for the investment programme of EYDAP, until now the State has not financed any of EYDAP's programmes. Instead of the foreseen state contribution, EYDAP covered the first year of the investment programme through its own funds (49 MEuros) plus the 41,2 MEuros raised from the increase of the stock capital (EYDAP, 2001). The level of fulfillment of the investment programme goals for 2000 was 20,4 MEuros less than foreseen, according to EYDAP due to "internal difficulties" (EYDAP, 2001).

For 2001, contrary to 2000, in the annual information report to its shareholders, EYDAP avoids to provide detailed data for progress in the investment programme. In an editorial in the Public Relations magazine of the Company, concerning the economic results of 2001 it is noted that "an important reason that influences the investment programme is the fact that the State has not fulfilled its contractual obligations according to which it should subsidise 60% of annual investments for the 2000-2008 period" (EYDAP Source of Information, April 2002,27: 3). The result of this is a significant delay in the progress with the investment programme and significant cutbacks in expenditures (Interviews EYDAP,05/12/02, 10/12/02)

Despite oft-repeated references to financing the investment programme from CSF, EYDAP appears to have done very little to apply for Community funding (e.g. prepare a detailed plan-proposal, etc). The general feeling in top management was that "in any case, and if not from Community funds, financing of the investment programme is anyhow guaranteed by the State" (Interview EYDAP, 5/12/02). As a consequence of this inaction, with the exception of an ongoing CSF-funded investment programme for the improvement of the aqueducts which had already been secured before the equitisation (1994), only minor works of the investment program benefited from Community financing. The fulfillment ambitious eight-years investment plan for the amelioration and expansion of the network is questionable now "that privatisation is not a priority and the government is distracted from other current issues loosening up its [obligations] towards EYDAP "(President of EYDAP, 25 July 2001, EYDAP Information Source, 24: 16). Therefore, despite some improvements in planning and investment management that had occurred anyhow before equitisation, it is questionable whether

Although EYDAP protests to the State for breaching the contractual terms by deferring from financing the 60% of the investment program, the question is how could it ever be expected from the State to finance from the PPI a programme of 735 MEuros in the midst of an austere public expenditure policy, restrained from convergence criteria. After all, the very reason for the equitisation of EYDAP was precisely the disengagement of the State from the need to subsidise the water services of Athens. Hence, critics of privatisation were partly right asking "what is the privatisation for, if a large part of capital investment is already ensured from the PPI or the EU".

Neither does the stock exchange market appear to offer the cheap access to capital promised. Capital raised from the increase of the stock capital of EYDAP (41,2 MEuros) corresponds to only 3.4% of the anticipated 8-year investment plan. Between 1999 and 2001, 16.2 MEuros were returned as dividends to shareholders. Expectations that "EYDAP would be able to collect significant financial resources in order to fund its investments by [exploiting in the future] the rise of the Stock Exchange market"(Xenos et al, 2001b),

have not been fulfilled. EYDAP's share followed the post-1999 dramatic fall of Athens Stock Exchange (despite being relatively "more robust" than the majority). In 2001, its value fell by 19% (c.f. a 23.5% decrease of the market indicator). Its value on 2 December of 2002 was 1,465 GRD as against 2,500 GRD in January 2000.

The main source of investment funding remains therefore the self-financing from tariffs and possibly lending from international donors, as it had been proposed by Knight Piesold long ago and without the need for equitisation (EYDAP, 1996). The proposals of consultancy were three:

1. to define a borrowing policy for EYDAP and include it a contract with the State
2. long-term planning of tariffs
3. preparation of a detailed investment program and submission to an international donor (such as the European Investment Bank).

This proposal for a serious planning of investment needs and a careful study of self-financing and borrowing opportunities was never taken up. The Ministry assigned to another consultancy (Welsh Hyder) to draft the investment plan (i.e. the actual 8-year plan) to accompany equitisation and entry of EYDAP in the stock-exchange market. This was not a detailed study. As a senior manager of EYDAP confessed in an interview to us "it was done in the rush to catch up with the deadline for equitisation within 1999 .. The investment plan was not based on detailed analysis of the needs, capabilities and technical peculiarities of the system of EYDAP ... but taking as a starting point that the State was committed for a subsidy of 60% of the project up to a maximum limit of 735 MEuros, a total of 1,226 MEuros was inferred, and then with rough judgements allocated to various projects"! (Interview EYDAP, 5/12/02).

Pricing policy

The 1996 Plan that Knight Piesold had prepared recognized that the ability of EYDAP to self-finance its investment programme would very sensitive at the level of tariffs (EYDAP, 1996: 8): "If tariffs increase annually a net 2% (i.e. on top of adjustment to inflation), then the investment program can be materialised rapidly. If the increase is by 2% smaller than annual inflation then EYDAP might be able to finance just half of its investment programme. With constant nominal prices, EYDAP may bankrupt by 2002".

Likewise, the possibility of EYDAP turning to external loans with favourable terms would depend directly upon the guarantee of future income and therefore to the guarantee of a given tariff policy. The proposal of the 1996 Plan was to increase tariffs at least up to the cost of water supply faced by EYDAP and readjust the prices to inflation since the last change. With this level of tariffs, EYDAP would be able to pay off its investment programme although with some delay, creating initially debt, which would be paid off as profits would increase with an increasing consumption.

The government decided in 2000 to increase tariffs of common consumption to 186 GRD/m³ (instead of the proposed in the Plan 220 GRD/m³). The tariffs though for municipalities was decided to be increased progressively to levels even higher than those proposed (Table No 10). A rough estimation based on the above is with the tariff development foreseen, the option of self-financing EYDAP is limited.

Table No 10: Water supply tariffs 1999-2004

Category	1992		1996		1/7/2000		1/1/2002		1/1/2003		1/1/2004	
	m³/ month	GRD /m³	m3/ month	GRD /m³	m³/ month	GRD /m³	m³/ month	GRD /m³	m³/ month	GRD /m³	m³/ month	GRD /m³
Common	0-5 5-20 20-27 27-35 35-	102 154 428 600 750	0-5 5-20 20-27 27-35 35-	117 178 514 720 900	0-5 5-20 20-27 27-35 35-	122 186 538 754 942	0-5 5-20 20-27 27-35 35-	124 190 550 770 962	0-5 5-20 20-27 27-35 35-	127 194 561 786 982	0-5 5-20 20-27 27-35 35-	+ % Inflation index 2003
Industrial	0-1000 1000-	192 225	0-1000 1000-	230 270	0-1000 1000-	241 283	0-1000 1000-	246 2289	0-1000 1000-	251 295	0-1000 1000-	
Public	0 -	228	0 -	274	0 -	287	0 -	293	0 -	299	0 -	
Municipal	0 -	54	0 -	65	0 -	88	0 -	103	0 -	120	0 -	+ % Inflation index 2003+ 15%

Source: EYDAP Website

Whether the government will fulfill the plan of tariff development foreseen is questionable. On the one hand, there is a pressure for "effective" pricing and self-financing of investments, but on other the so-called "social mission" of EYDAP continues to be considered important (EYDAP, 1999). The Government is also prone to use utilities prices in order to control inflation pressure, which after a period of cessation has reappeared with the shift from drachmas to Euros. Table No 10 refers to the expected readjustments to inflation, as defined in the Contract between State– EYDAP. However, in the "frame of governmental decisions on freezing the tariffs of PUCs", the tariffs of EYDAP were not readjusted in 2001, while, after the revaluations that followed the adoption of Euro in 2002, the planned change for 2002 was suspended for April. At the time of writing this text (March 2002), the last price change was this of 01/07/00.

On the other hand, the lack of a clear regulatory system for determining prices generates other concerns. The definition given in the law of setting tariffs based on a "legitimate return on investments" (Article of 3 Law 2744/1999) is so broad that allows

the government "to fix arbitrarily the value of capital". The State becomes in practice the "guarantor of the profitability of the shares" (Parliament Proceedings, 28/09/99, 1225) with no defined and transparent rules however, governing its decisions.

Relations between State and EYDAP

The above analysis of the issues with the investment program and pricing policy, suggest that many of the of the pre-equitisation problems in the relation between State and EYDAP persist.

Public sector debts from unpaid bills to EYDAP increased by 21% between 1999-2001, reaching 22,3 MEuros (EYDAP, 2002). Municipal debts, after an initial reduction in 2000, increased again in 2001 by 4,4 MEuros (25%) probably due to the substantial increase of municipal tariffs. Despite the relative provision of the Law, municipal debts have not been retained by the Treasury.

Also, EYDAP retained the responsibility for flood control protection, without however being paid by the MESPPW for its services nor even for its related expenses (EYDAP, 2001). Drainage and flood protection projects together with the investment program for the aqueducts are 85% financed by the CSF and the Cohesion Fund by the KPS. However, until 2001, while EYDAP was paying the expenses for the necessary works, the State had not even paid the European contribution!

With the end of the annual subsidy of 44 MEuros in 2001, the logistical results of EYDAP deteriorated considerably. In the first semester of 2002 (a period where the tariffs remained unchanged), pretax profits of the company were 19,5 MEuros, down 51% in comparison to the first semester of 2001 and despite an 8% increase of turnover (EYDAP Source of Information, 28, 16). The fiscal situation of EYDAP is even worse yet, since payments from the State for works that have been already carried out and paid by EYDAP are still pending.

From jubilations after equitisation for the "new millennium, which finds EYDAP more powerful and more competitive than ever" (EYDAP Source of Information, 12), two years later there is talk about the "unbearable .. current reality and the threat of bankruptcy"! (EYDAP Source of Information, 28, 8). Given the still considerable – albeit reduced - profits and the return of considerable dividends to shareholders, referring to the option of bankruptcy is probably more as a means of the company to press the State to settle its debts and undertake the subsidy of the investment program that an real threat. Nonetheless, the General Manager of EYDAP evokes a "careful management of investments and activities" and an editorial in the company's magazine refers to a "drastic reduction of expenses" (op cited, 28, 8).

Organisational and Service Performance

Managerial changes and Internal Planning

Starting in 1996 after the PUC Law and before the equitisation, EYDAP management proceeded with a restructuring the company's organization, aiming at the improvement of functionality and the potential for investment implementation.

The first key change was the integration of the General Secretariat for Water Supply (WGS) with the Sewerage General Secretariat (SGS) under a Networks and Installations General Secretariat (NIGS). This corrected a functional division between the water supply and sewerage sectors which had its origins in the pre-1980 period when each was a separate entity (Xenos et al, 2001a).

A second important innovation was the establishment of a Planning and Development General Directorate and, for the first time, a special Directorate for "Programming and Planning". The role of this directorate was mainly to monitor and carry out the EU- funded projects (aqueducts and drainage) (Xenos, 1999). The establishment of the directorate and the appointment of an out-sourced project manager for the works was a response to the EU requirements for CSF-funded projects (EYDAP, 1996).

Regarding the company's internal structure, new directorates have been set up aiming at internal control, functional renovation and better financial and operational administration (Xenos, 1999).

Although there is lack of specific data that would allow an informed judgment, a rough appraisal is that administrative modernisation has led to a relative improvement in the capacity of EYDAP to carry out projects and investments. The 1996 Plan had set as a goal an increase of investment rates from 20,5 MEuros/yr (actual investments in 1996) to over 60 MEuros/yr. In 2000 investments in the network were 88 MEuros while investments in the aqueduct projects were 82 MEuros (EYDAP, 2001, 44-46).

Improvements in the field of information technology and telecommunications were also substantial. These tasks involved the amelioration of computer automation and the installation of an internal and external network, the installation and operation (for the first time) of on-line software to manage accounting data and bills, the development and use of hardware and software systems for the plotting and management of networks and the remote monitoring of aqueducts and pumping plants (EYDAP, 2001, 2002).

The above improvements, however, had been already underway since the law for the modernization of public utilities in 1996. It is difficult to judge the extent to which these changes are related to equitisation - partial privatisation and the change in the ownership structure of EYDAP per se, or if they would have taken place anyway.

Long-term planning is an essential element of a contemporary business and it is a prerequisite foe the more "rational" management of the water supply system. The already mentioned 1996 Master Plan prepared by Knight Prieslod on beahlf of EYDAP was mandated by the 1996 law for PUCs which required that all PUCs submit an operational

and strategic plan to the State. The plan, despite its technical competence, was not really part of the internal operational planning of EYDAP. It was an external study carried out by consultants and never assimilated in the day-to-day operation of the company. Despite provisions in the law for three-year or five-year updates of the Plan, no such updating has been carried out. The so-called "Master Plan" is a useful reference report but it didn't become a truly instrumental platform for long-term planning. It is indicative that despite the existence of the Master Plan, the Ministry of National Economy assigned anew to a consultant the preparation of a new investment plan before equitisation. The new investment plan, which was prepared without any contribution by EYDAP executives is, according to the opinion of a high rank executive of EYDAP "maybe appropriate for some Nordic country but totally inapplicable in Greece" (EYDAP Interview, 5/12/00).

Accountability

One of the main arguments in support of equitisation was that it would lead to an increase of the accountability of EYDAP's, since (in the words of the Minister of National Economy) "the stock exchange market puts every company under constant scrutiny and control from consumers and investors" (Parliament Minutes, 28/09/99, 1191). The assumption was that with the State at "an arm's length" from the company and with clear contractual rules upon specific Level of Services obligations, it will be possible to monitor and assess EYDAP's performance (Xenos et al, 2001).

However, the annual service performance reports that EYDAP had to submit to the MESPPW and to the consumers, despite being clearly mandated in the State-EYDAP Contract, 5 years after have not yet been available[3]. Furthermore, there is no regulatory or monitoring mechanism in the Ministry to check and evaluate such reports and related data, even if they were available.

The assumption that the introduction of the company to the stock exchange market and its monitoring by the shareholders would provide an incentive for improvement and enforce greater "discipline" to the company can not yet be verified. The dramatic decline in the value of the share of EYDAP is certainly not connected to the performance of the company itself. Similarly however, the initial rise of the share value had nothing to do with EYDAP's performance and prospects. The "immature" and unstable Greek stock exchange market provides little control and guidance. The little scrutiny that the highly ambitious but completely unrealistic investment programme of EYDAP received, serves as a testament. Certainly, the introduction of the company in the stock exchange market makes difficult the reappearance of deficits in the future, but if this is to be done by State support it doesn't mark any real progress.

3 A closer look at the performance indicators reveals that they have been directly adopted from the England & Wales Water Industry Benchmarking System (see OFWAT, 2000), probably owing to the fact that the consultant who proposed them, Hyder, is a Welsh water company. Some of them have little applicability to the Greek context. For instance, the indicator "hosepipe bans" relates to a particularity of English law (bans applied to public and garden hosepipes in cases of drought), but bears no relevance whatsoever to Greece were there are just a few hosepipes

Independence

As discussed in another section, the Government has not respected its contractual obligations with respect to pricing policy (prices have not been automatically adjusted to inflation rates), the subsidization of the investment programme nor the recovery of the debts of local authorities (the Government has not proceeded to withhold the debts from the public funds of the local authorities). Moreover the Government has delayed payment of the costs undertaken by EYDAP for flood protection and drainage and for the modernization of the aqueduct system. These tasks have been removed from the competency of EYDAP and the company was supposed to carry them out on behalf of the State with due compensation. EYDAP is still a majority public company and has not tried to challenge judicially the breach of the contractual agreements on the part of the State.

EYDAP's top management is still closely linked to the MESPPW and the government. The resignation of the President and the General Manager of EYDAP in March 2002 had to do with the internal politics of the ruling political party and the change of Minister of ESPPW. According to the newspapers the new President of EYDAP is deemed to be a "person of trust" of the new Minister. Note that while the President of the Company is to be appointed by the government, the General Manager, who has most executive powers, is to be hired through an independent, open tender, on the basis of merit. However, exploiting a clause of the Law, which assigns the tasks of the General Manager to the President until a competition for the position takes place, a forced simultaneous resignation of both President and General Manager facilitated the concentration of both powers to the new appointed President (Newspaper Eleutherotypia, 03/03/02 and 06/03/02). This situation has not changed up to now (September 2003). So much for the proclaimed "autonomy" of the company from the government after equitisation.

However, some improvements can be observed in comparison to the period of full public control. For example there is greater freedom and more meritocracy in personnel policy (see below). EYDAP has also been given more freedom in the assignment of subcontracts and the procurement of materials. This had been a major cause of inefficiency in the past, as contracts even for the simplest purchases, were subject to a lengthy bureaucratic process following several authorisations from different Ministries (Xenos, 2001). The extent however to which such improvements necessitated the partial privatisation of EYDAP, or could be achieved within a framework of "modernization" of EYDAP as a public utility is questionable.

Personnel policy

Voluntary retirements have decreased the real number of employers (from 4,804 in 1996 to 4,262 in 2001) and have increased the index of personnel per connection (from 3.0 in 1996 to 2.6 in 2000). Nevertheless, both the cost of items sold and the general expenses have also increased (Table No 9) and it is difficult to evaluate real changes in EYDAP's productivity. The increase of "sales' cost" is mainly due to the increased cost for "repairs and maintenance" and new supply connections, while the increase of

general expenses is related to the raise of salaries granted to the administration and network personnel. The salaries of managerial staff have significantly increased (from 0,97 MEuros in 1998 to 1,45 MEuros in 2001, with the maximum annual salary being 100,000 Euros in 2001 up from 70,000 Euros in 1998). Nevertheless they are still far from the extreme salary increases for top management observed after privatization of water services in other parts of the world.

Hiring of the new personnel of EYDAP is conducted through the High Personnel Selection Committee for the Public Sector (ASEP). This mechanism is a definite improvement to past practices, increasing meritocracy. New hiring are no longer decided on an ad hoc "clientelistic" basis from the ruling government, but with due consideration to the specificities and needs of EYDAP. Internal transfers of employees between EYDAP and other public bodies (e.g. ministries, local authorities, etc) were frequent in the past, resulting in excess, non-specialised staff in many positions, often "absent from the productive process" without punishment. The more reliable procedures applied by the High Personnel Selection Committee have lead to the employment of highly educated and specialised individuals for the new working positions (EYDAP Information Source, 27, 15). Note however that this is a change that stems from improvements in the employment policy of the public sector and not the equitisation/privatization of EYDAP.

Diversification of activities and multi-utility operations

Concerning the export of "know-how", EYDAP has worked as a consultant to prepare water supply and sewerage plans for the Prefectures of Cephalonia and Ithaca (Sarrou, 2000). Abroad, EYDAP undertook the preparation of an integrated project programming plan for the improvement of the water and sewerage networks in three cities of the FYROM. This project, with a budget of 300,000 Euros, has been funded by the Ministry of National Economy, within the framework of a Greek-FYROM co-operation programme (Newspaper "Niki" 23/10/01). Recently, EYDAP joined in a strategic agreement with the Vivendi multinational company, for the development of joint business activities in the countries of South-Eastern Europe, Eastern Mediterranean and North Africa (EYDAP Information Source, 27: 23).

EYDAP has also initiated business activities in fields other than water services, such as the marketing of bottled water, as well as in the liberated markets of telecommunications, energy, and natural gas. A feasibility study regarding the production of bottled water from the high quality groundwater boreholes of the company in the area of Mavrossouvala is under preparation, while eleven applications have been submitted for the development of energy production units, out of which seven relate to hydroelectric installations in aqueducts and reservoirs of EYDAP for a total maximum capacity of 5 MW (Xenos, 2001). Since 2001, EYDAP participates by 25% together with other PUCs, in the "Alternative Telecommunication Networks S.A.". This joint venture aims to attract a strategic investor as partner for the development and commercial exploitation of a digital telecommunications network with optic fibres in Athens. The underground networks of EYDAP can be used as paths for the new digital network (EYDAP, 2002). Furthermore, given its expertise EYDAP intends to undertake the task of installing and managing

small domestic pipes for the main natural gas network in several neighborhoods of Athens.

Service performance

There is not publicly available data on network services, such that would allow a comparison of service performance before and after the partial privatisation of EYDAP. Although it's a contractual obligation of EYDAP to collect relevant data (e.g. on pressure of supply, delay until complaints are answered, interruptions – see Consumer charter and Contract State-EYDAP) and submit reports to MESPPW and to the public, such reports have not been available to date.

In comparison to the Latin American and African cases examined in the PRINWASS project, connection to the network is not an issue in Athens. Connection coverage is in the order of 97% of urban households.

Performance with respect to resource management (delivery efficiency, water demand management, etc) is examined and assessed separately.

Social Equity

Subsidies and distributional issues

Under the new regulatory regime, EYDAP is now a company 30% owned (soon 49%) by private shareholders. The notion that the State (or the EU) can subsidize the investment program of the company requires closer scrutiny, to the extent that public subsidies may be used to support private profits. For example, the expansion of the water supply network to the periphery of the city may be justifiable as a public policy of extending drinking water and sewerage provision to underserviced areas but it also increases the assets and the customers base of a partly private company, with public funds.

Having the security of state subsidy for core services, EYDAP might also devote its resources to activities that are not related to its utility services (e.g. bottled water or optical fibre network). This might also be the case even if the State does not subsidize core services, in a worst-case scenario that EYDAP might underinvest in core services in order to undertake more profitable subsidiary activities. This raises a question of hidden cross-subsidies, where EYDAP could devote both financial and human resources in profitable activities (in multi-utilities like natural gas pipeline installation, the production and marketing of bottled water or granting the use of its ducts for the optical fibre network –fields in which it is already involved, EYDAP, 2001, 2002), cutting on its investments in non-profitable core activities, i.e. leakage or consumption control. As discussed above,

the limited regulation monitoring and the practically inactive Level of Services contract provide little control over such situations.

The assumption is that profit will result from the "decrease of costs through more efficient human resources with increasing productivity and improved exploitation of infra-structure and technology" (Minister for National Economy speech, Parliament Minutes, 28/09/99). In simple words, the assumption of the proponents of equitization was that the privatised EYDAP will fulfill at least the same goals as it did as a Public company, and at the same time make profit by performing its activities in a more cost-efficient way. But how can this be assessed without a proper regulatory-auditing system? Such a system should have defined and monitored a framework of goals and performance indicators and relate them to profit.

In practice, the costs of EYDAP have not decreased after equitisation, despite the fact that its profits have multiplied (Table No 9). Cost increase could be due to increasing investments for the upgrading of infra-structure (e.g. investment in information technology). However, lacking a monitoring mechanism that could provide information one the above, one might equally well speculate that EYDAP makes profit and pays dividends to its shareholders based on State subsidisation and benefiting from an uncontrolled increase in consumption, which is unsustainable in the long-term.

Openness and democratisation of decision-making

The activation of a Public Relations Directorate and the publication of annual reports by EYDAP (Annual Statistic Report, Annual News Bulletin for the Stock Exchange) have improved the availability and the transparency of internal information to external parties. In the period 1993-2000, EYDAP has attempted an opening towards the broader public (customers and later, potential investors). On the contrary, during the period of drought (1990-1993) and under fire for mis-management and political scandals, EYDAP was much more reserved regarding information and data disclosure. It only remains to be seen whether the relative openness during the last years will be maintained in a future period of crisis.

The annual shareholders report for 2002 raises some doubts in this respect. It looks like EYDAP is trying to confuse the picture regarding its financial situation, which deteriorated considerably because of the end of the State's annual subsidy and the lack of public financing for the investment program. In comparison to the report of 2001 there is no information whatsoever regarding progress with the investment program (!).

The annual report of EYDAP to the consumers (foreseen in the Contract between State and EYDAP) has not been available to date, although the company is committed by law ("Consumers' Charter") to produce and disseminate such information.

A further problem is that there is no external mechanism to check and validate the data that is given in the various reports.

With respect to participation in decision-making, there has not been any major

change after equitisation. In the past (1987), the social-democratic government had passed a law for the "socialization" of all public utilities, including EYDAP. This included setting up a "Representative Committee of Social Control" in each utility, consisting of 9 representatives of the State, 9 of the employees, 4 from local authorities and 5 from associations such as the National Workers' Association, the Association of Employees in the Public Sector, the Technical Chamber and the Chamber of Commerce and the National Association of Farmers. This Committee was supposed to have an advising role in the approval of the annual budget of EYDAP and had to be consulted in all major policy and planning issues. It had also the right to ask for the resignation of Members of the Board. In practice this institution remained inactive and was formally abolished in 1992.

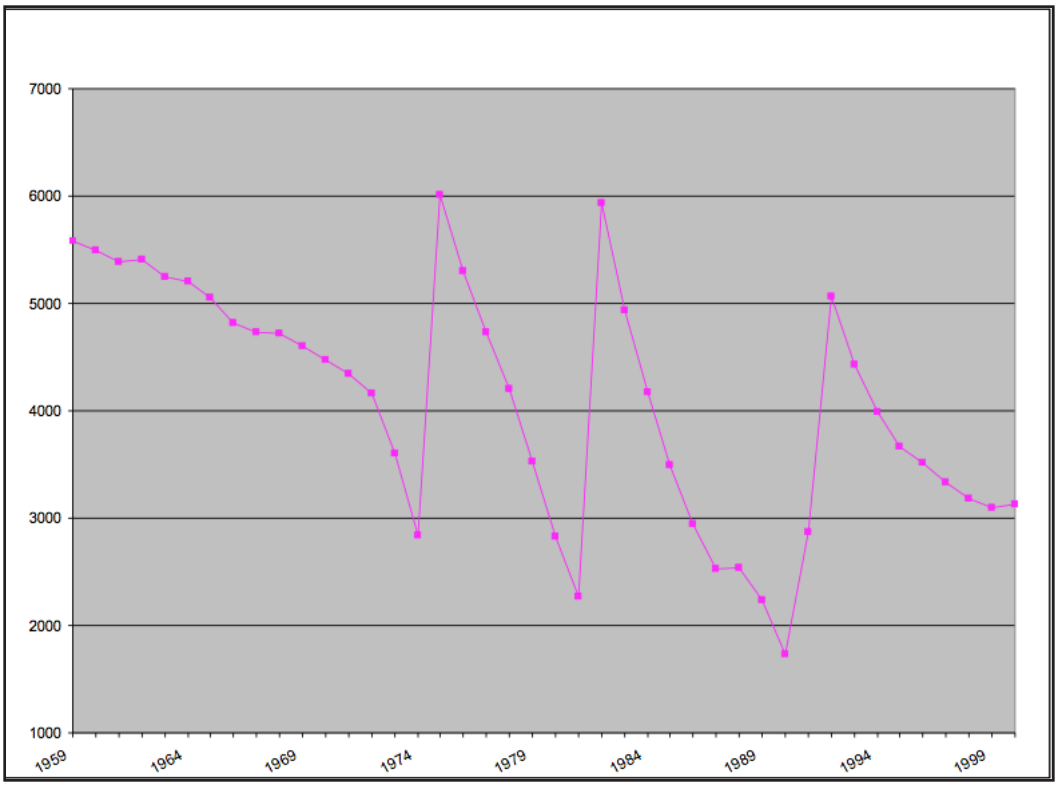
Another mechanism of "social control" introduced by the social-democratic government upon its return in power in 1993 was the setting of a "Social and Economic Committee" to oversee legislation that would impact on labour relations (mainly relating to "privatisations"). This Committee, consisting basically of the same principal social actors as the PUC's Representative Committees, assumed an advising role in many relevant laws. According to proponents of the institution the Committee has fulfilled its role. According to critiques, control and participation have been superficial, in practice legitimising decisions already taken. For the case of EYDAP, and as mentioned in another section, the government was criticized for sidelining the official role of the Committee, passing the law without previous debate and under the provision of emergency in the summer period of the legislature.

At the level of resource planning, there are no active participation mechanisms neither at the level of EYDAP nor at the level of the broader river basins, whose water resources are utilized by Athens. The National Water Framework Law 1739/1987 "for water resource management" foresaw the establishment of "Councils - Assemblies" at the regional level, consisting of the principal regional social actors (professional associations', local authorities, etc), responsible to oversee the drafting of the regional water plans and abstraction licensing procedures. These committees have been inactive and did not affect in any way the management of Athens' water resources. At the urban level, planning and management of water resources is considered an EYDAP-only matter and there is no provision for involvement of the public at any level.

Cost of water and social impacts

Chart No 17 illustrates the monthly cost of water services for a family of four consuming 200 m^3/year (average household consumption as set by the International Water Services Association), on the basis of the water tariffs each year and in deflated 1999 prices (obviously an average family in the 1960s would consume much less, but the same index is used for comparative purposes).

Chart No 17: Monthly deflated cost of water services for the average family of four, in drachmas (1Euro = 340 drachmas)



A general observation is that the cost of water has remained roughly constant through time, although average household incomes in the same period have increased a lot (20% between 1981-1991). Peaks relate to changes in the tariffs. These are typically followed by a period of unchanged prices, real prices decreasing due to inflation. As mentioned, prices from 1999 should (at least, in principle) be adjusted to annual inflation. This has led to a relative stabilisation of the cost of water since 1998 onwards as depicted in Chart No 17.

Although low in absolute values the price of water in Athens is comparable to that of other Western cities (Table No 11).

Table No 11: Cost of a water supply-sewerage bill in Athens for an average household, compared with other cities

	US$/m³
Milan	0.13
Rome	0.32
Los Angeles	0.60
Bologna	0.63
Paris	0.73
Berne	0.74
Washington	0.80
Athens	0.87
New York	0.88
Thessaloniki	0.94
Bordeaux	1.08
Porto	1.23
Lisboa	1.24
Coibra	1.28
Geneva	1.35
Zurich	1.36
Lyon	1.38

Source: OECD, 2000; data for 1995.

According to a market research of EYDAP customers, average houeshold expenditure for water supply and sewerage is 7.6€ per month for low income households, 10.6€ per month for average income households and 14.7€ per month for high income households. This relates to about 1.4%, 1% and 0.6% of their incomes accordingly (Kanelopoulou, 2001). If data is accurate, this suggests that the cost of water is generally affordable.

However, 52% of the people interviewed in the above market research consider the cost of water supply as high (38%) or very high (14%), although only 3.8% of the households interviewed spend over 3% (acceptable cost-poverty threshold) of their stated income for water supply and sewerage services (and not all of them are low-income households) (Kanellopoulou, 2001). This suggests for a significant potential of social resistance to water price increases and partly explains Government's hesitation to transform water pricing policy.

Regarding the municipal networks, the anticipated increase from 1999-2004 is as high as 98% in fixed prices (Table No 10) (higher even than the proposal in the 1996 Master Plan for a 77% increase in order to recover supply costs) (EYDAP, 1996). The situation is complex. EYDAP's stance that the supply of treated water to the municipalities is charged below the cost of production and that municipalities make profit by charging water to their citizens at prices similar to those of "common consumption" in the EYDAP network (EYDAP, 1999, 2001, 2002) is not necessarily accurate, at least not for all municipalities. Municipalities face a high cost for distribution, including the installation and maintenance costs for the network, which due to scale effects is probably much higher per unit of water delivered than that in the main EYDAP network. Municipal networks tend also to be much more spatially dispersed than central Athens' network. Vafidis (1992) argued with gross calculations, that even with the low prices that municipalities were charged at the time, water distribution induced financial damages, even with the insufficient investment on network maintenance and repairs that the municipalities carried out. Therefore, there is a question of whether municipal water supply is possible at the new increase prices. Furthermore, EYDAP's argument that municipalities receive water below production cost is only partially true. EYDAP refers to fixed average cost. But when the municipalities were connected to the central network, this was precisely because the additional cost for EYDAP to supply them with water was very low, as there were minimum demands for new infra-structure (just a central pipe to municipal networks). This was a main reason why EYDAP at the time preferred this form of agreement with many municipalities than take over the whole networks (Kallis, 2003).

The new increase in municipal debts during 2001 suggests there is a problem. The municipalities refuse to surrender their networks to EYDAP because they deem that the compensation offered is low (in most cases equalized with debts) and there is a growing reaction against the rising charges seen as an instrument by EYDAP to acquire the networks.

Despite the apparently low cost of water supply, potential effects of rising prices on lower income groups should not be underestimated. The pressure for a prices increase will intensify in the future, given the financial problems that EYDAP faces and the lack of funds for its investment programme. The lack of scientific information and analysis with respect to the income elasticity of demand does not allow for any definite conclusions. Still neither should "market research" on ability to pay be taken for granted as scientifically it is very inaccurate.

According to unverified sources, increase in prices during the 1990-1993 drought impacted disproportionally on lower income groups (Kaika, 1999)[4]. In England, the increase in the cost of water that followed privatisation led to a significant increase of disconnections of poorer households from the network due to failure to pay (Bakker, 2000). On Athens there is a special provision in the Contract between State and EYDAP for the assignment of a category of "vulnerable consumers", deserving special treatment

4 Kaika refers to information presented before the Parliament, according to which, following an increase of prices, 18% of domestic consumers were responsible for 60% of consumption. Nevertheless, it is not defined upon which data this information was based.

in terms of disconnection, but there is no progress to date in defining and protecting such customers.

Although an increase in prices might involve social impacts, from a social equity perspective neither does the past model of a generalised subsidy of the cost of Athens water supply constitutes a solution. Note than the "non-recovered" (that is non-recovered from prices) cost is somehow covered (subsidized), e.g. from general taxation. Subsidies could be substituted by the pricing mechanism in so far as the latter endorses notions of fairness such as those of the taxation system, and avoid a disproportional burden to the weakest groups in the name of economic efficiency.

Servicing new areas and inter-regional equity issues and conflicts

Drinking water supply is universal in Athens but a critical issue is the connection of the peripheral municipalities (along the coast and the northern and western parts of Attica) as well as proxime regions to the EYDAP network.

The continuous, abundant and high quality drinking water supply of Athens is not the rule for the rest of the country, where generally network supply is only rarely potable. The level of water and sewerage services enjoyed by Athenians connected to the network of EYDAP is unparalleled in the rest of the country.

In many islands for example, bottled water presents the primary source of drinking water. This situation is faced in many of the surrounding municipalities in the fringes of Attica as well as "satellite" towns in neighbouring regions. In the city of Korinthos for example, network water supply comes at a low pressure and is of unreliable quality. Local groundwater sources used in the past by municipal networks are limited for the rising demands of a growing ("suburban" or secondary-house) population and exhausted (with the effect of salinisation in coastal aquifers) and often polluted from overland urbanization (or even where not, there is a growing mistrust from the public) (Vafidis, 1992).

The expansion of the network first to eastern Attica and then to western Attica is considered as "contributing to the social mission of the company" (EYDAP, 1999: 177). Similarly, the transfer of water to the islands (Argosaronikos, Cyclades and Cyprus in periods of droughts) is considered as in line with the "social role" of EYDAP.

On the other hand, the expansion of water services in the regional periphery of Attica and the increasing water resource consumption it entails, have a broader inter-regional dimension. EYDAP transfers water from the far hinterlands of the west (Mornos, Evinos) and from the rural and agriculture-based Biotikos Kifissos basin (Yliki) to satisfy demand in the wider metropolitan area of Athens serviced by its network.

The transportation of water resources from the under-developed, yet rich in waters, Western Greece areas for the needs of Athens, is characteristic of a broader pattern of centralisation, supported by State policies (Burgel, 1981). Electricity for Athens is also

brought by remote energy plants in South, Western and Northern Greece (Burgel, 1981: 50-51).

Regional disparities in water supply services have been remarkable. In the prefecture of Phokis, crossed by the river Mornos, only 15.8% of the population received full water supply services in 1980, while 84.2% had access only to limited services (ΚΕΠΕ, 1990).

For the construction of the Mornos river dam, approximately 2,500 hectares of agricultural fields had to be confiscated. The construction of the dam led to the desertion of the area. Indicative of demographic decline the number of pupils in the Phokis elementary schools, 4,000 in the year 1975 (before the construction of this work) reduced to 1,850 in the middle 1990s. The six elementary schools in the fourteen municipalities surrounding the dam have been all closed (Prefecture Document submitted to the Parliament Operations Interruption Department, Ref. no 901, 27/09/99). The dam also caused the inundation of an area of rich cultural and historical importance including a the 19th century stone bridge, a famous old Pension and the remnants of the ancient city of Kallipolis, an Aetolian city destroyed by the Gauls during the 3rd century B.C. (Mitsios, 2002). The landowners of the fields confiscated for the construction of the dam received compensation. Given population statistics they too, like many other Greeks from rural areas moved to Athens investing their savings to the housing market (Burgel, 1981).

In August 1997 the Phokis Prefecture organised a rally to the Mornos River dam (Newspaper «Ta Nea», 16/08/97). The Prefecture Council stated that the dam had adverse effects to the local economy, increasing road access times and preventing surrounding areas from being cultivated; the Council demanded financial compensation from EYDAP. Moreover, there was an attempt to "institutionalise" this compensation, demanding a 6% charge on the price of water in Athens and the payment of the resulting sums to the Prefecture of Phokis. The representative of the area to the National Parliament requested this to be introduced as an amendment in the new law for the equtised EYDAP (Parliament Minutes, 28/09/99, 1207). Nevertheless, the Minister of National Economy rejected this amendment as being beyond the realm of the Law (the petition was rejected by the Parliament).

Reactions from other hinterland regions against water transfers to Athens have intensified. The Prefecture of Aetoloacarnania strong opposition to the transfer of the waters of the Trichonis Lake to Athens during the water shortage is indicative of this situation (Kaika, 1999, Kallis, 2003). Members of Parliament from the Region submitted before the National Parliament a series of petitions drafted by citizens' pressure groups, like the "co-ordination committee" against the Acheloos River diversion, and the transfer of the waters of Lake Trichonis, the "Aetolian Environment Protection Organisation", and the Municipalities Union of the Prefecture (Parliament Minutes, Session ΠΑΓ΄, 21/5/93 and ΚΔ΄, 22/7/93). Their main argument was that the constant "bleeding"–in some cases referred to as "robbery"– of the area's water resources from the rest of the country has to stop, especially when, as in the case of Lake Trichonis, no real needs were attended but instead "fictitious" reasons were used to justify the transfers and other badly scheduled work that was being implemented to serve Athens. The Prefecture of Aetoloacarnania is second in land area in all Greece but only 48th in terms of GDP. It is a rural area and the largest part of the population lives from agriculture. Only 50% of fields are irrigated, while many municipalities, even those located on lakesides and

riversides, have rudimentary water supply networks. Locals questioned whether the "needs" of Athens should constitute an absolute priority against the development needs of the area. The threats for violent reactions against the work that had been heard at the Parliament are indicative of the violent opposition this work would face had its implementation begun (finally, the decision was cancelled following the end of the drought and other economic scandals following the work). Although it is not known to what extent these threats actually affected the final decision for the cancellation of the project, they certainly played an important role.

Similar reactions were induced by the boreholes in the Biotikos Kifissos River. According to newspapers, farmers of the municipality of Elatia even got armed, threatening EYDAP managers who visited the area. The farmers' reactions take place every time water is drilled from EYDAP's boreholes in the area. This usually happens during drought periods, when underground resources are naturally low aggravating the impacts on farmers' boreholes. During the summer of 2001 "police forces came to prevent the farmers from taking the law into their own hands in the areas of Lokris and Boeotia. The farmers attempted to stop the drilling from the groundwater boreholes of EYDAP". "Mayors and local producers filed complaints against the managing director of EYDAP, as well as against the Area Manager" (Newspaper "Ta Nea", 25/07/01). Given that, in the summer of 2001 EYDAP groundwater boreholes were only partially used, reactions and conflicts might turn out much more intense in the future, if a serious drought event takes place.

This opposition reflects a growing resentment of the water-abundant regions of the west to water transfers to the east. The diversion of river Acheloos to the irrigation plains of Thessalia had been one of the most ecologically and regionally controversial water projects in Greece to date.

Isolated from its broader context, the improvement of water services in the metropolitan area of Athens and the islands is a justifiable social goal. On the other hand, there are important wider distributional issues underlooked. For example, the increase of water use in the metropolitan periphery is partly the outcome of an unrestrained and environmentally wasteful process of suburbanization. These processes of urban expansion have been intensified by the decision to locate the new international airport in the Messoghia plains (Map No 2) and improving transport connections to Athens, opening-up new residential areas. Far beyond reflecting "local needs", the growing water demand in the coast of Attica relates to the increase of secondary and more recently, primary residential housing. New residential developments are characterized by gardening patterns contrasting the local aridity (e.g. lawns, swimming pools). The same holds for the islands of Cyclades, where the rapid and unplanned growth of tourism and secondary housing, typically without respect to local environmental and water resource conditions, has led to a manifold increase of water demand. Subsidising therefore the transfer of water from the west and the expansion of the service area of EYDAP is not a "neutral" response to social demands but it contributes to a reconfiguration of space with important distributional implications.

As discussed before, opposition from locals to water transfers does not reflect so much a reaction against the dominant "hydraulic model" (saving for environmental organizations, local and national), as much as a demand for compensatory investments

in the region. Expansion of EYDAP infrastructure and services to the communities in the proximity of the reservoirs and the aqueducts is a popular demand from regional authorities. This points to a potential scenario of "regionalization" of the water system of EYDAP serving an extended area including the regions where the water resources are found and the aqueduct passes up to the wider metropolitan area of Athens. Although, probably more "equitable" from a socio-spatial point of view, still such a scenario might have detrimental ecological impacts (Kallis and Coccossis, 2000). The riverine ecosystems of western Greece relate to one of the most important and few remaining wetland complexes of Greece and Europe (the "Messologhi" lagoons). To this we turn in the next chapter.

Resource Management and the Environment

Incentives and disincentives from the new legal framework

Private sector participation entails an institutional change or a "re-regulation" in the water sector. In this section it is examined how the institutional change accompanying the partial privatisation of EYDAP structured the incentives and disincentives for and against a cautionary management and conservation of water resources in the case of Athens.

In a previous section the legal framework governing Athens' water resource management was presented. Essentially the legal framework sustains the "protection" of EYDAP and of Athenians from the rising cost of water. The cost for Evinos dam, built (1993-2002) to augment the supplies of the city, has been subsidized 85% by the EU CSF and 15% by the State. This cost will not be reflected in water prices.

Furthermore in the Contract between State-EYDAP, the first has committed to cover any incurred additional cost that may result from the use of the energy-intensive lake Iliki or the boreholes. Likewise, the responsibility for the financing and construction of any future major hydraulic work that may be necessary in case of an increasing water demand, rests also on the State. This means that EYDAP is insulated from the cost of an increasing water consumption that would make necessary the utilization of the more expensive sources or the development of new ones.

Although there was in the Contract a provision for charging EYDAP for the abstraction of water, in practice this charge has been equated with EYDAP's cost for operating and maintaining the (State-owned) reservoirs and aqueduct. The State retains however the right to impose such a charge after the first five years, although there is no specific reference to the form of this charge.

Therefore, EYDAP and consumers will continue to face only the operational cost of water supply, with the capital expenses being covered by the State. And even some costs that are classified as "operational" could be covered by the State as there is a provision for subsidization (by public or EU funds) of investments such as network maintenance and renewal, leakage detection and control, etc.

These provisions maintain an "asymmetry" of incentives for EYDAP against a demand-oriented management of water resources. With prices set for a five-year period, EYDAP has limited motive to control the increase of demand. On the contrary it has an incentive to see increases in demand, as water sales are the main source of revenue. The additional income in 2000 relative to 1998 from water supply and sewage service sales was 38 MEuros (Table No 9). This increase derives "mainly from the overall increase of consumption in volume by 15.3%" (EYDAP, 2001: 51). With a hypothetical demand management policy that would limit consumption to 1998 levels (for example through a media campaign or with incentives for the repair / replacement of household hydraulic installations), the only economic benefit for EYDAP in 2000 would have been from the State subsidy. That is, without subsidy and with demand controlled under constant prices, EYDAP would not be profitable.

Similar disincentives work against leakage control. EYDAP does not face the real cost of raw water and has its supply guaranteed. On the other hand, measures for leakage reduction would increase short-term operational expenses. Leakage reduction is pursued only to the extent that it can be financed (see: subsidized) through the investment program and as a side-effect of broader investments on network renewal and expansion. Given the problems with the investment program, expenditures for leakage control were among the first to face cuts as they increase short-term costs without contributing to an increase of revenue (save for the reduced treatment and distribution costs which however have not been quantified).

Theoretically, the aforementioned disincentives should be counterbalanced by the terms of the Contract between EYDAP and the State, which asks that the former establishes a five-year resource management plan and submits it to the MESPPW for approval. The plan, which is discussed in more detail in the next section, indeed reduces the risk of careless management such as that recorded in the 1980s (where the reserves in Mornos were overexploited while water available from Lake Iliki was left unused, because abstraction from the latter was more expensive – Kallis, 2003). Note also that EYDAP no longer faces restrains in operating the Yliki lake pumps and the boreholes since the State guarantees that it will cover for the additional expenses.

A fine is also foreseen in the case that EYDAP does not meet the leakage reduction targets. But this is very small at about 6 Euros / 1,000 m^3 lost above the maximum leakage target. Up to now the State and EYDAP have not determined the annual "optimal level of leakage" in order to specify the annual goals for leakage reduction as foreseen in the terms of the contract. There is no mechanism as yet to distinguish leakage from under-metering (which forms a substantial part of un-accounted for water) nor other standard process to determine the actual level of leakage. Basically, EYDAP is free to calculate the level of leakage as it wishes and the end result in easily to be manipulated by changing the assumptions concerning the extent of meter under-registration.

The problems highlighted above raised again the broader issue of the external monitoring and control of EYDAP. This is relevant also for the five-year resource management plan. In theory, the plan should be checked and approved by the MESPPPW. Within the Ministry however there is no specialised office or personnel to undertake such a task. The State therefore has no capacity to ensure that, for example, EYDAP will not allow an uncontrolled increase of demand (and extension of the network), that will

be very expensive in the medium-term (use of lliki and boreholes, possible new project expenses for increasing of water resources) for the State. The assumption is that as long as EYDAP remains majority State-owned, there is no need for separate control as there was no specific control when EYDAP was fully public. However, in the 1980's when EYDAP was a public company, similar economic mal-incentives were behind an unwarranted increase of demand that led to the costly paid drought (Kalis, Coccossis, 2000). Now that EYDAP has been partially privatized and entered the stock-exchange market, the pressures to maintain profit pose even more serious threats of "externalizing" costs by underinvesting on resource management and misusing the resources.

The above analysis may convey the wrong impression that the State, if it had the full information and control of the system, would care for the control of water use as its increase entails substantial long-term costs. The experience from the last drought suggests otherwise as it is elaborated in detail in Kaika (2000) and Kallis (2003).

Official statements of EYDAP confirm the linkage between profits and a rising water consumption. According to the report submitted by the company upon entrance in the stock-exchange market, a major attractive factor for EYDAP's share is the "continuous increase of priced consumption" (EYDAP, 1999: 179). In the presentation of EYDAP to investors, the General Manager made explicit that a main advantage of the company is that "the consumption of water over the last years shows a growing trend; on average 7% annually.. we expect that over the next five-year period there will be an intense growth of consumption because of the expansion of the company, specifically in Attica" (EYDAP, Source of Information, 18: 16). In another similar venue the General Manager underlined "the advantages that result from secured raw material that (EYDAP) processes, the monopolistic character of product that it manages... and the progressive expansion of the areas of activity that will result from the swift built-up growth of neighboring Municipalities and Communities (EYDAP, Source of Information, 29: 7).

In a response to criticisms of the equitisation policy made by Parliamentarians who claimed that the partial privatization of EYDAP may lead to an overexploitation of water resources, the Minister of National Economy responded that "when a company manages a good in relative scarcity.. it attends to its long-term safeguarding.. which yields a lot more.. profits for the company as well" (Proceedings of Parliament, 28/09/99, 1231). However, as we argued above, this needs not be the case, in so far as the legal framework distorts incentives.

The new legal framework for EYDAP does not attempt to address, much less "internalize", the environmental and regional dimension. This does not come as a surprise since, as argued in another section, the law was not formulated in order to transform urban water management but in order to make the equitisation financially viable. Indicatively, the Contract recognises only the cost of maintenance and operation of the fixed assets as factors to be taken into account when (if ever) a charge for raw water is applied to EYDAP (EYDAP, 1999). No reference is made whatsoever to the possible "environmental", "scarcity" or other external costs of water.

During the discussion of the Law in the Parliament, the Minister ignored repeatedly the interventions of the MP from Fokida who demanded for a charge to be recovered from the price of water as a compensation for the Mornos reservoir region. In the end

he briefly responded that, "this is not the right moment to discuss this issue" (Minutes of Parliament, 28/09/99). His response makes clear the dominant thinking which sees the legal framework of EYDAP as dissociated from broader issues of water resource management, environmental protection or regional equity. The presumption is that these issues are settled separately with respective laws and that EYDAP operates within those.

However, the national regulation framework for water resources management and environmental protection, as expressed in law N.1739/1987 remains inactive. Even though particular decrees of the Law were activated during the 1990s, the situation remains unchanged. Regional water planning does not take place, regional authorities do not have regulatory powers and there is no mechanism to complying with ecological or other standards. As a result the regional planning of water resources management has not influenced the strategy of EYDAP for the water supply of Athens at any point. On the other hand, the incentives set by the new legal framework of EYDAP for expansion and increasing water use are real and pressing.

A typical response, however, is to downplay the importance of regional disparities and issues in water allocation, in so far as Athens is concerned. According to such views the supply of potable water to the capital of the country, where 35% of the population live is seen as something of outmost priority that cannot be wasted in outdated agriculture in Viotikos Kifissos or because of the ecological quality of some little-known rivers in Western Greece (Interview EYDAP, 3/12/02). The above simplification however, which positions the water supply of Athens as of "prevailing public interest" is part of the problem. The "needs" of Athens are not given. An increase in consumption is not the inevitable result of demographic and socio-economic changes, as popularly thought, in so far as it can be controlled, for example through:

- the pricing mechanism,
- leakage detection and control,
- controls on the expansion of the network vis. a vis. protection and upgrading of local resources
- land-use planning and development control policies for Athens,

or other mechanisms available to exercise public control, which are not implemented because they are contrary to the profit-oriented motives of the privatised EYDAP.

Therefore the issue is not about the "needs" of Athens but about properly balancing different goals, e.g. the preservation of ecological quality of Western Greece rivers vs. the maintenance of low cost water for Athenians or the profitability of EYDAP and the income of its shareholders.

EYDAP's water resource management policy

The logic that governs water resources management in the period after the end of the drought (1993-today) and the addition of the Evinos Reservoir to the supply is that there are enough surplus reserves for the satisfaction of the increasing demand, and for the expansion of the network to new regions, with due care however to restrain "wastage" of water. The goal is expressed as "rational management of existing sources and not the development of new ones" (EYDAP, 1999: 175). This does not mean long-term restriction of demand or control of network expansion. The term "rational" refers to a better management of reserves, a limitation of distribution losses and the reduction of "wastage" during use. Emphasis is put on monitoring the system so that drought phenomena are timely identified and dealt with (Kuriazis, 2002).

According to the General Director of EYDAP the goals of the new policy are that "the growth in water consumption should be restrained at the internationally accepted levels of 1.5-2% per annum... Increasing consumption ... and expansion of EYDAP to other regions ... necessitate the timely preparation of a study by the Ministry for the development of new sources. In the meantime the reserves should be managed rationally and exclusively for the needs of Athens" (Newspaper "Kathimerini", 24 March 2002, our translation and emphasis)

Modernisation of resource management

Since 1994 EYDAP is carrying out works on the aqueduct system, with a total budget of 147 MEuros to guarantee the safety of water supply through the provision of alternative routes and interconnections between the aqueducts. There are also projects for the upgrading of existing aqueducts. Works include among others increase of the supply capacity of segments of the Mornos-Athens aqueduct, strengthening of the aqueduct's walls, construction of inter-connecting aqueducts between the Yliki and the Mornos aqueducts. Apart from increase of supply capacity and improved flexibility in using (or combining use) of the different resources of the system, there are certain benefits in terms of resource use. The particularity of the water supply system of Athens where Lake Yliki looses its reserves due to bottom sinkholes, means that an improvement of the aqueducts system can allow a more flexible distribution of abstractions from Mornos and Yliki and thus reduce total losses from the system (EYDAP, 1996).

The allocation of abstractions between the different sources of Athens (Mornos, Evinos, Yliki, boreholes) is of major importance. Since 1999, EYDAP commissioned a five-year research project to the National Technical University (NTU) for the "Modernisation of the supervision and management of the water resources supply system of Athens". The objective is the development of a Decision Support System, based on modern simulation models of the hydrological data aiming at the optimisation of abstractions from different sources for given safety levels of demand satisfaction and (energy-related) cost (Koutsogiannis et al, 2000). The model had already been used for the production of the Water Resources Management Plan for the period 2000-2005 as required by the EYDAP-State Contract (see above). At a later stage of development, the

model should be fed with real-time data and depict them in a Geographical Information System, allowing the prediction and adjustment of the abstraction policy in real time.

The model was put in operation in 2000. Before, abstraction policy was based on empirical observation of the levels of the reservoirs. Since 1993 and after the intensive use of the boreholes, the supplement of water from Evinos and a sequence of good hydrological years, the Mornos reservoir filled up leading gradually to end the abstractions from Yliki Lake and the boreholes. Losses however from the reservoirs have increased as Yliki is filling up again. According to the management plan, which is based on long-term hydrological predictions, "until the project of Evinos River functions fully, there will be a demand for greater contribution from Yliki Lake and groundwater" (Koutsogiannis et al, 2000, 94).

Expansion of the EYDAP network to municipalities has been typically followed by an abandonment of local resources previously used. In the new plans for expansion, and despite calls for integrated water management, there are no provisions to maintain some of these resources, at least for secondary uses. It is difficult to estimate the potential contribution of such sources given their deteriorating quality due to aquifer pollution. The lack of interest on such options per se is illustrative.

Losses control and demand management

During and after the drought, there was an effort to reduce the quantity of un-accounted for water. This effort centred primarily on the replacement of old, faulty volumetric meters, which under-registered consumption considerably, by new velocity meters. This led to a significant reduction of the difference between the output from the treatment plants and the final consumption metered, increasing the revenue of EYDAP, but had nothing to do with the reduction of the actual losses from network leakage.

In the investment programme for 2000-2008 it is anticipated that 19,7 MEuros will be allocated to leakage detection and control and 134 MEuros invested for the "replacement and restoration of the existing network", aiming at the increase of the supply capacity and a more rational arrangement of the network. This modernisation of the network should also lead to a reduction of leakage.

However, up to now, progress in leakage control has been limited. Since 1996, reference has been made to a pilot programme for measuring, locating and repairing the leakages in an area accounting for about 14% of the total length of the EYDAP network (Kyriazis, 1996). This program was completed in 2001 (EYDAP, 2002). The conclusions "were very important for the further organisation of actions and investments..and it is possible to save significant quantities of water from locating and treating leakage, with the assistance of special equipment for their detection" (EYDAP, 2002). But these proposals have been already made since 1994 (EYDAP 1995) without real progress. Some detection units have been bought but do not operate due to expenditure cuts and lack of technical operators (EYDAP interview 10/12/02).

The end of the drought signified an end to the efforts to control demand. Restriction measures were removed. Newspapers announced to Athenians that now they can "water their gardens and lawn and wash their cars without restraint" (Newspaper "Ta Nea", 28/02/95). When in April 1997 the city's reserves reached 1 billion m^3, the General Manager of EYDAP declared that "we can start now seeing more systematically ...the upgrading of the role of EYDAP and the expansion to new areas" (Newspaper "Ta Nea", 30/04/97). Management executives of EYDAP, although reminding the public that excessive water use and wastage should be avoided, they made sure to stress that the water scarcity and the danger of water shortage was past and that EYDAP was now in a position to supply regions that faced droughts with water. The General Manager declared in 1998 that "the boreholes and the works carried out in the last few years plus the substantial rainfall, have created reserves for the city ... that will last for 20 years". He talked about transporting water to Cyprus and the Cycladic Isles (Newspaper "Ta Nea", 05/11/98). With these statements and by discontinuing the information campaign, the message the message to control water consumption that the public was receiving through media campaigns faded.

Since 1992, tariffs remained practically unchanged (Table No 10) in line with the historical pattern of periodic price changes in periods of crisis followed by long periods when prices remain unchanged and fall in real value due to inflation (Chart No 17). The decrease of the cost of water combined with an environment of sufficiency explain the rapid increase of water use in all user categories (Chart No 10). Note that the influence of water prices on demand does not depend only on the absolute price levels but to a large degree on their design and structure (bands, switch levels and price differences) vis a vis demand characteristics (Hanemann, 2000, Dalhuisen et al, 2002). In 2000, and after the equtisation / partial privatisation of EYDAP, new tariffs were introduced. These tariffs were designed on the basis of cost recovery and safeguarding the economic viability of EYDAP (EYDAP, 1996), but the structure of the tariffs remained unchanged. In Athens the greater part of consumption (about 90%) falls into the two lower price bands (EYDAP, 2001, 2002). Strengthening of incentives to save water would require more bands and price differentials within those two bands to provide more incentives for saving and have real impacts on consumers' behavior, with sharp increases of the price for high consumptions (in EYDAP's case, greater than 20 m^3/month) (Hanemann, 2000). Such a policy may have better results in terms of demand reduction, but offer less safety of returns, since the bulk of consumption might shift to lower bands. This is problematic for the partly privatised EYDAP, making more difficult the prediction of future profit, as reducing high-level consumption would have a negative impact on revenues. EYDAP itself recognised in its annual report that increasing revenue from water sales in 2000 was primarily due to an increase of consumption in the highest band (EYDAP, 2001).

The change of tariffs in 2000 was not followed by any particular publicity campaign. Consumption in 2000 continued to increase in comparison to 1999. 1999-2000 was a poor hydrological year. Athens' reserves declined and the "drought alarm bell rung again" (Newspaper "Ta Nea, 10/01/01). EYDAP started anew a publicity campaign to control consumption, although this time the messages did not have the intensity of those circulated during the previous drought. Consumption in 2001 stabilised and in the common category slightly fell (Chart No 17). This documents the immediate results of a publicity campaign, in connection perhaps with a –slightly delayed- realisation of

the increase in prices. The fall of consumption was more noticeable at the high charge bands, aggravating impacts on EYDAP's revenue in 2001 (EYDAP, 2002).

With the return to normal rainfall patterns in 2001-2002 and the beginning of full operation of the Evinos reservoir, reservoirs replenished. The message of EYDAP asking for restrain on water use was quietly withdrawn. The control of consumption in 2001 had contributed to the poor financial results. With the guaranteed water supply of Evinos, there was no longer urgent need to control consumption. The debate turned once again to the plans of EYDAP for expansion. Already, and in the midst of the publicity campaign for the restriction of consumption, an Interministerial Committee on Water was deciding that the drought faced by the Islands of the Cyclades should be solved with transfers of water from Athens (Newspaper "Eleutherotypia", 12/04/01). EYDAP soon announced that it will go ahead with the extension of the network to other regions as soon as it secures sufficiency of water (Newspaper "Ta Nea", 28/06/01).

Recently EYDAP went ahead with commissioning a study to the consulting company Knight Piesold for the restructuring of tariffs, which provides insight to its future pricing policy (if the State adopts a policy of price readjustment, something that does not seem possible so far). The criteria given to the consultancy for planning prices were the "increase of EYDAP revenue according to its financing needs and the maintenance of the water price within acceptable levels. Demand management was not set on the table for discussion" (interview EYDAP, 10/12/00). Since demand management was not set as a goal, there was no analysis of demand characteristics, which is a basis for any long-term, conservation-oriented tariff policy. The assumption was that, firstly "the rise in prices is enough for constraining demand", and secondly that "if there is ever need for further control of demand it will be done with special restraining measures and tariffs, as in the last water shortage" (NTU Interview, 28/11/00). The study proposed the compression of domestic tariffs into two bands aiming at the simplification of the administrative burden (and cost) of EYDAP, and also the securing of returns, since a system with fewer bands allows a safer prediction of returns (Hanemann, 1998).

Neither does EYDAP's network policy indicate a cautionary approach to water resource management. As soon as the reserves replenished, EYDAP put in motion expansionist plans for extending the network to new municipalities. According to predictions, a full-scale expansion of the network to the broader metropolitan area and beyond will add a further 550,000 people to the network and will increase water use by about 100 hm^3/yr (Koutsogiannis et al. 2000). Such a scenario looks more unlikely given the current economic recession of EYDAP and the lack of investment funds. A more restrained expansion scenario predicts an additional population of 200,000 people and an increase in water use in the order of 20-50 hm^3/yr (Koutsogiannis et al. 2000). In public debate there is no reference whatsoever to the implications in terms of demands for water resources of such an expansion. Nor are there intentions to conserve and use (at least in secondary uses) the existing local sources. Although this might not be in all cases relevant or feasible, the total lack of discussion on the issue is indicatory of the continuation of the expansionist model, which wants a replacement of local sources from the central EYDAP system and their subsequent abandonment.

Prospects

Is the goal of EYDAP, for rational development within the limits of existing sources through an efficient use of reserves, achievable or only wishful thinking?

Chart No 10 showed the trends in Athens' water consumption and presented different scenarios. The most recent ones are those performed by Koutsogiannis et al., 2000 for the water resource management plan of EYDAP. As evident in the chart, actual consumption has already surpassed the scenario of low consumption. Trends in 2000 and 2001 suggest a high demand scenario. Consumption has already gone over the threshold of the safe "economical" yield of 410 hm^3/year (i.e. yield safeguarded under abstraction practices that minimize operational cost – i.e. priority abstraction from Mornos-Evinos). In practice, this means that if EYDAP continues to use primarily the Mornos-Evinos reservoirs and keeping Lake Yliki as an emergency supply, the possibility of error of the system increases with the rise in water use and reaches 100% for a consumption of 440 hm^3 (Koutsogiannis et al, 2000:76). Of course, in practice EYDAP has already started using Yliki and groundwater boreholes as reserves fell and following the proposals of the model and the plan. However, even the safe yield of the system (480 hm^3/year with a certainty of 99%) will be surpassed according to the high demand scenario in 2006, while according to an intermediate demand scenario will surpass it by 2009 (see Chart No 10).

Therefore, the rise in demand will meet the limits of the resources of the system within this decade. The danger of a new water drought will increase. The five-year Water Resources Plan proposes to take controlling measures to restrict demand within 410 hm^3/year. This does not seem to be happening. Losses for example, which in all scenarios of the plan are considered as limited to 90 hm^3/year, in 2001 reached 100 hm^3 (Chart No 10). The leakage control programmes and those of maintenance/ refurbishment of the network are the first to suffer the results of the 2001 expenditure cuts. Even if the cuts of the investment programme restrict the expansion of the network, the rise in demand within the existing network is enough to exceed the safety limits set for water resources (Kallis, 2003).

The fact that a demand management policy is not implemented is not the result of omissions or lack of programming, but as it was argued earlier, it is an outcome of the institutional framework and the fact that EYDAP does not face the cost of increasing abstraction while water sales are its main source of revenue. As a result, EYDAP does not have serious incentives for a long term and persistent limitation of demand, but only for short-term controls when reserves are close to their limits and for expanding anew when sufficient reserves have been secured, or, even better, the next resource has been added to the system.

Improvement of delivery efficiency (e.g. limiting losses of aqueducts and network) happens only as part of interventions which in the long-term increase production capacity (increase of supply capacity of water system, upgrade of network and its supply capacity). The structure of the eight-year investment programme (Table No 8) is indicative: 30% would be given for the expansion of the network, 30% for replacement / renewal and only 4% directly to leakage detection and repair. The network upgrading

programme may have leakage reduction as a side-effect, but its main goal is the increase of the supply capacity and therefore the preparation for satisfying higher water demands (EYDAP, 1996).

The main potential water resources to respond if water demand continues to grow, are located in Western Greece and in the vicinity of the Mornos-Evinos complex. Potential projects would have a significant one-off cost (in the order of 150 MEuros), high operational costs as pumping will be required to the higher-altitude Mornos aqueduct (in the order of 5-10 MEuros per annum), and they will most probably generate regional and environmental conflicts, given the importance of the Messologhi lagoons complex with which most potential resources are linked (Kallis, 2003).

We do not claim that a drought crisis or new waterworks are inevitable in the near future. There is nothing to render impossible choices such as the systematic control of demand and leakage, a joint management of the Biotikos Kifissos River basin with farmers securing groundwater, or the improved exploitation of new groundwater boreholes (EYDAP Interview, 05/12/02). A prevailing view among experts confirmed in our series of interviews for the PRINWASS project was that with a large increase of prices and the enforcement of demand management measures like those implemented during the previous drought, consumption could be constrained within the limits of the sources in the short-term, while in the long-term a systematic pricing policy could maintain demand within serviceable levels (Interviews NTU, EYDAP). The question is why such policies have not been implemented so far and why demand was left to increase so much since 1993. Our answer shifts attention to the continuation of disincentives against water conservation under the new legal framework for the equitised EYDAP.

Pricing instruments are important if consumption is to be controlled and water resources conserved, but the issue is much more complex than a simple increase of prices. As discussed in a previous section, a rise in prices may face public reaction and/or have distributive impacts on the less well-off. This partly explains the hesitance of the government in authorizing a raise of prices. With respect to water conservation, an important issue is where will a surplus that may occur as a result of price rising go. If it is reinvested into the network expansion program, as EYDAP intends, then the dynamics of a long-term increase in water use are maintained. If due to the increase in prices there is an increased profit for EYDAP, then issues of social justice arise, since EYDAP will be rewarded possibly without having improved its performance. Lack of a regulation and supervision system for EYDAP is making monitoring of all the above difficult. Another issue is that the impact of prices depends on their design and the "information" that accompanies price change. However, as the experience since 1993 shows, even if the prices rise, EYDAP does not attempt to induce reduced water use among the public.

Concluding, institutional change following the partial privatisation in Athens WSS seems to maintain, if not reinforce, the structural disincentives against water resource conservation seen in the pre-privatisation period. Within a context of more or less constant prices, rising water use provides a main source of profit for the partially privatised EYDAP. This maintains a pattern of increasing water use, which in the long term might lead to significant environmental impacts, if a new water work becomes necessary. Therefore, EYDAP claims for a "rational" and "environmentally friendly" use of water following the "modernization" of the company are questionable. As Kallis and Coccossis (2003)

discuss extensively in their analysis, the regulatory regime ("institutional arrangement") determines what counts as "rational", i.e. cost beneficial, and for whom. What appears as "rational" from the perspective of EYDAP in a given legal framework and set of economic incentives may not be rational in toto and from a broader social perspective. The institutional arrangement following the partial privatisation of EYDAP continues to displace the cost of water use in the metropolitan area to the source regions, the environment, and the future.

Part C : Key Findings of the case study

The context: PI in Greece and the case of Athens

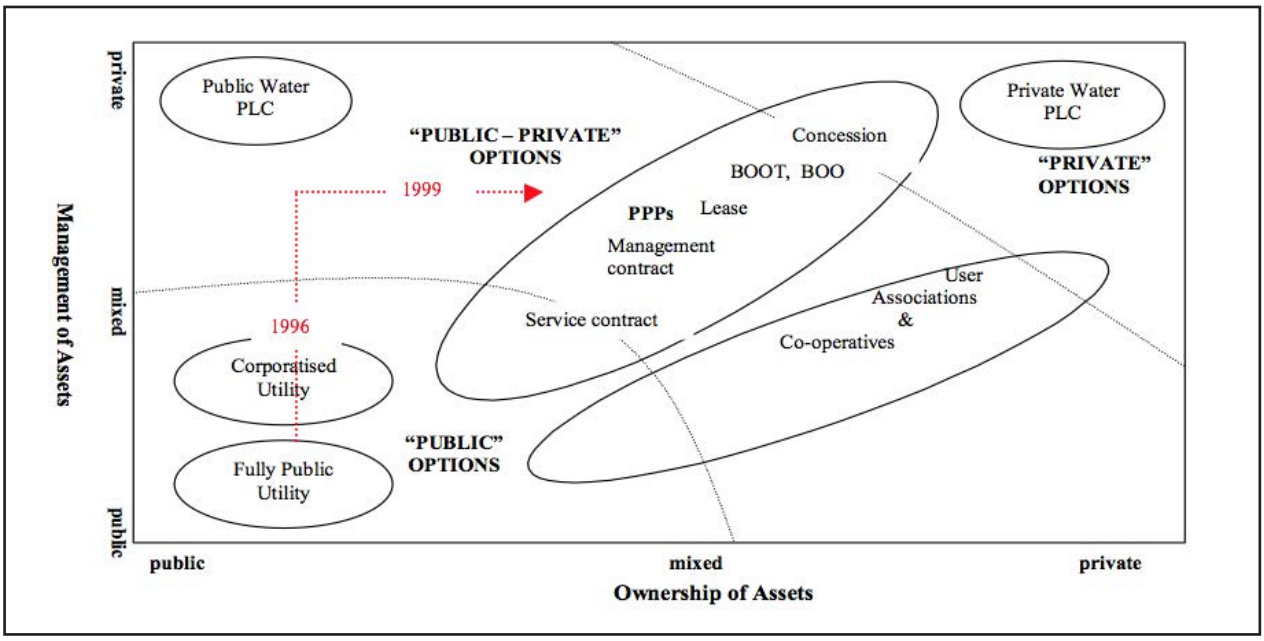
Until the mid-90s all water utilities in Greece but Athens' were "fully public utilities" under municipal control. WSS in most small municipalities were provided by WSS municipal departments. In bigger municipalities, towns and cities, WSS were provided by so called "Municipal Enterprises of Water Supply and Sewerage" (DEYA). These are publicly owned, public-style managed (though some are private law companies) and should be positioned somewhere between fully public and corporatised utilities in the heuristic diagram of Figure No 1.

Athens' water supply and sewerage enterprise (EYDAP Inc.) has been an exception. From 1928 to 1974, EYDAP was a private company owned by the U.S. Ulen Co and operating under a BOT concession by the State. In 1980, EYDAP became a state-owned, private law enterprise ("corporatised utility"). In comparison to the rest of the country where municipalities had the responsibility for WSS (under the supervision and financing of the Ministry of Interior), in the case of Athens it was central government (through the Ministry for Public Works) that had the responsibility for the management of the enterprise (strategy, selection of president and board, prices, etc).

This situation changed in 1996 when under a law for the "modernisation of public utility companies" (PUC law), EYDAP, together with other major public sector utilities (electricity, telecommunications, etc) was distanced from the public sector becoming a public plc, i.e. a private style company with increased autonomy in management and investments, but under public ownership. In 1999, the capital of EYDAP was "equitised" and a minority of its shares was made available by the State to private investors through wide distribution in the Stock exchange market (Chart No 18). An 8-year investment programme was set, prices were fixed for a 5 year period and a Concession Contract was signed between State and EYDAP describing respective duties and rights. A Regulatory Act institutionalised the contract and settled the economic differences of State and EYDAP. The same PI model was followed for the water utility of the second major city of Greece, Salonika ("DEYATH"; Municipal Enterprise of Water Supply and Sewerage of Thessaloniki Inc.). Greater Athens (approx. 4 million people) and Greater Salonika (approx. 1 million) account for 50% of the population of Greece. The rest of the country's population is still served by municipal enterprises or departments.

PI in EYDAP is emblematic. It is the first water utility in Greece where PI was introduced and is a model that will be followed in other cases of PI in WSS, if and when they take place. It concerns the capital city of Greece, its administrative and economic heartland, where 40% of its population resides. As the say goes "Greece is Athens" (albeit an unpopular and painful say for the rest of Greeks). By looking at the findings from the case of Athens, broader lessons for the future of PI in Greece can be drawn. To these, we turn next.

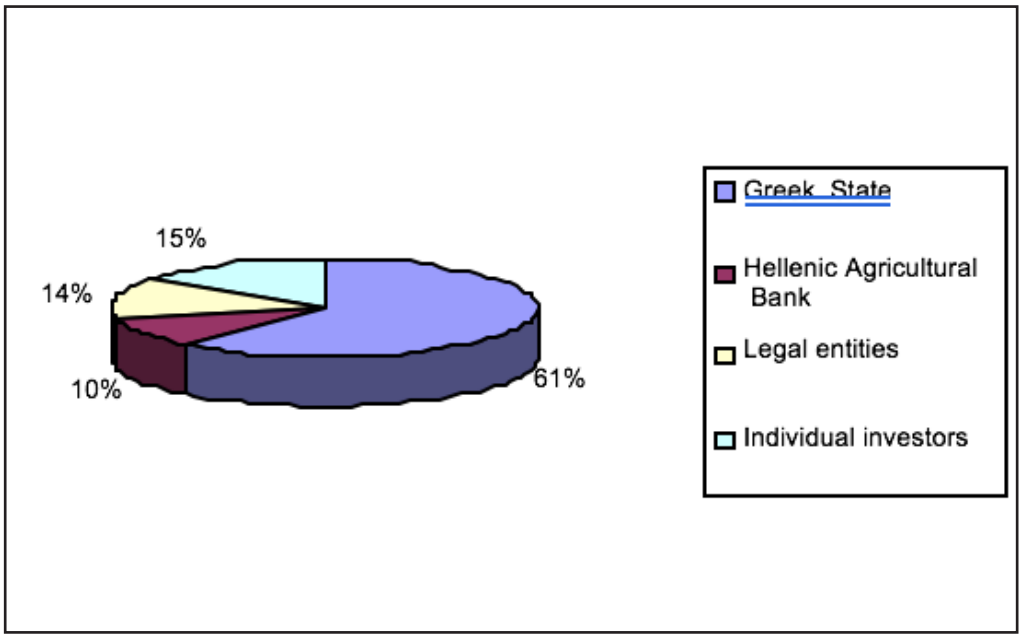
Figure No 1: A Taxonomy of Public-Private Organisational regimes



Source: adapted from Blockland et al, 1999[5] (the red line indicates changes in EYDAP).

5 Fully public utilities include the archetypal types of: government water service departments; "regies" (internal municipal government entities but with a defined and separate set of accounts); more independent publicly owned, public law utilities (typically municipal and rarely provincial or state-based).
Corporatised utilities refer to public law companies that resemble private companies in terms of managerial independence and flexibility.
In Private limited companies water services are provided by fully private utilities with ownership of infrastructure assets and full responsibilities for all operations, maintenance, revenue raising and investment.
Public Private Partnerships (PPPs) refer to organisation models where ownership of the system (or part of it) remains in public hands and its operation (or part of it) is delegated to private entities.
Public limited companies (PLCs) (state or municipal) have a corporate structure with a managing director and a board of directors. Unlike the corporatised utilities, they are commercial business operating under private (company) law. Unlike a private company however, their shares are owned by government (local, provincial or national). Minority private shareholding is also possible.
Co-operatives are enterprises (public or private law) owned and controlled by the users of the goods and services provided (consumers, employees -e.g. trade unions- or producers of products and services).

Chart No 18: EYDAP's shareholders



Socio-political issues

Key findings:

1. The process of PI in Athens' WSS has been a deeply political process. The move towards privatization and the selection of the equitisation model was not designed as a means to achieve a goal of better water services and resource management, but as a goal in itself. The underlying belief was that a move towards more PI will improve the performance of the utility in all aspects and will attract much needed financing.

2. Choice of the equitisation model (minority private sharehold dispersed in the stock-exchange market) reflects the dominant socio-political conditions: European Monetary Union (EMU) convergence-driven dictated private participation in public utilities, in order to reduce in the short term public deficit and to "show to Brussels" commitment to reforming and liberalising the economy. On the other hand, popular unrest derailed the conservative governments' privatization programme; the new government had committed against "privatization". Equitisation was seen as a third-way, in between. The same model has been applied in all Public Utility Companies (PUCs). There was no concern in the design of the model for the particularities of the water sector.

3. There have been no new mechanisms to foster public participation and democratization of water service and resource management. The provision for the – largely dysfunctional – "Social Councils" (part of the 1987 "socialization" of Public Utilities Act) was formally removed after PI. Municipal authorities' and union delegates in EYDAP's Board have seen their influence in decisions weakened. Formal consultation bodies and the Board were sidelined by top management and the Ministry in the preparation of the equitisation. There was limited public debate before equitisation with institutionalized social actors (trade unions, citizens organizations, etc), although law provided for a formal consultation process.

4. The activation of a Public Relations Directorate and the publication of annual reports by EYDAP (Annual Statistic Report, Annual News Bulletin for the Stock Exchange) have improved the availability and the transparency of internal information to external parties. These improvements however had already started with the 1996 PUC Law and should not be attributed only to the PI process. Controversial financial information in the last year has been disclosed from the annual report to investors, raising doubts whether transparency has indeed increased. Financial data put in the company's website in 2000 has not been updated since then.

5. PI in EYDAP was relatively free of social conflict. The Trade Union of EYDAP was the only organisation that strongly resisted equitisation. Even though the union started up a campaign with broadcasts in national radio and television, its power was limited (9% of its members participated in an anti-PI strike). The management of EYDAP appeased employees by offering them company shares in privileged prices (20% lower than official prices). Also a portion of the State's revenue from the shares was offered to the employees' pension fund.

6. Compared to other public utilities' privatisations, PI in EYDAP generated intense political reactions in the Parliament. All political parties of the opposition (conservative and communist) stood against the bill, while some parliamentarians from the governing (social-democratic) party in an exceptional move defected from party line and voted against the equitisation of EYDAP (the bill was approved with a slim majority). Opponents stressed the public good character of water. The PI model followed was exactly designed as a "half-way" privatization that would appease concerns and avoid the popular reaction that derailed the previous government's privatization programme. Majority public control was maintained, whereas private shareholding was distributed to small individual investors and not to a foreign multi-national. Furthermore, ownership of "water" and related assets (reservoirs) was removed from the capital of EYDAP and remained in the public sector. As the managing director of EYDAP put it: "the principal advantage of gradual privatization through trading of shares in the stock market is the minimisation of the adjustment cost that is the cost resulting due to the transition from the old status of a national and public corporation to a new private company. This cost can be very high and derail the whole process in a dead end'. Cost does not refer only to the financial cost but also to 'any possible reaction form employees, customers and suppliers. The process of gradual privatisation provides the necessary time for each side to adapt to the new conditions and the necessary time to the government to decide on the final ownership structure of the company' (quoted in Kallis and Coccossis, 2003).

7. Water prices for individual customers have not increased; they have only been adjusted to inflation rates. As a result, there have been no popular protests against PI in EYDAP. Significant increases however have been applied to the price of bulk water supplied to some municipalities in Greater Athens that retain the ownership and management of their networks. Water to these municipalities was previously supplied subsidized, below production cost. EYDAP wants to take the ownership of the networks from the municipalities in exchange for municipal debts accumulated over the years. Municipalities complain that increasing prices is part of a strategy of EYDAP to take the networks free of cost. This situation breeds a serious conflict but note that this is not a popular conflict, but rather an inter-administrative one; citizens in the municipalities probably prefer the higher quality – lower cost services of EYDAP.

Financial and economic issues

Key findings:

8. Financing of the substantial investments needed for Athens' WSS by the private sector was the main claim of government and EYDAP directors in favour of PI. The evidence available five years after does not support this claim. Funds drawn from the stock-exchange market sufficed for financing less than 1/8 of the 8-year WSS investment program set in the contract. Dividends paid to shareholders more or less equaled the funds raised by the stock exchange market. Given current conditions in the market, drawing more private funds from the Stock Exchange market in the future looks highly unlikely.

9. EU Support Funds appear as the main source of external financing for the investment programme. PI was intended to lead to improvement of the long-term planning capacity of EYDAP, supporting the preparation of an investment plan that could be used to apply for external assistance from the EU or investment banks (e.g. European Investment Bank). Such an investment plan has not been prepared (other than one prepared by a consultancy before the PI) and there has not been any application for funding from the EU or international banks.

10. State subsidies remain the main source of financing for EYDAP. This however runs counter to the rationale of PI, i.e. that it would lead to attraction of private funds and would reduce the burden for the State. The Concession Contract foresees that if EYDAP does not manage to secure external financing from the EU, then the State should cover up to 60% of the funds for the 8-year investment programme. This looks highly unlikely given the tight fiscal policy of the government. Furthermore, if it does take place, then it raises social and regional equity concerns. First, public subsidies will be used to increase the value of partially privately-owned assets and contribute to private profits and dividends to shareholders. Indeed, in 2002 the State did not pay any subsidy to EYDAP leading to a considerable decrease of revenue and a plummeting of its share in the Stock Exchange market. The following year, the State partly financed the investment programme and revenue

and dividends to shareholders increased considerably. Second, Athens' WSS will continue to be subsidized whereas other urban WSS in Greece, with considerably inferior standards of service, do not receive state support.

11. The part-privatisation was followed by a reform of the price system. First, prices were increased to adjust to inflation change in the previous 5 years (a period during which prices had remained nominally unchanged). This change however, can not be attributed only to the drive from the equitisation of EYDAP. A pattern of price adjustments after long periods of unchanged prices is common in the history of Athens' water supply. Second, it was agreed that the tariff structure will remain unchanged for a 5 year period, but that prices will be automatically adjusted to the inflation rate each year. The government however has not kept up this legal commitment.

12. Current price levels do not suffice to recover funds for the financing of the investment programme. The government is hesitant to allow an increase of prices. It even delayed the annual adjustment of water to inflation in 2003 prices (together with other utilities' prices) to control the public impacts from high inflation in other consumer goods following the shift from drachmas to Euro.

Institutional (regulatory) issues

Key findings:

13. Majority shareholding by the State and the Concession Contract are the two ways of public control of EYDAP. The Contract defines the duties of the company, including among others, customer and service standards (and indicators to monitor them), water efficiency standards and preparation and implementation of a water resource management plan.

14. The Offices of the Ministers of Public Works (supervising Minister) and of National Economy (responsible for public utilities price setting and investment programmes) are policically responsible for EYDAP but there is no formal mechanism actively overseeing the operation of EYDAP (regulatory office, department or other).

15. There is no available data or benchmarking system to allow an accurate assessment of EYDAP's performance. EYDAP has not complied with the provision made in the Contract for submission of data and publication of an annual review report available to the public.

16. There are no formal and transparent regulatory principles and mechanisms governing profit returns, price-setting or subsidies. The law states that prices should be determined in order to recover costs and investments plus a "reasonable return" for EYDAP. Decision on the actual definition of these terms and the determination of prices rests on an inter-ministerial committee.

17. The contract and the regulatory framework were designed on the basis of making

the PI attractive to investors. Resource issues were subsumed under this goal and included as an 'add-on" (e.g. by requiring EYDAP to prepare a resource management plan and implement a leakage reduction programme). However, many structural incentives stemming from the legal framework act against the achievement of some of these performance criteria. For example, the State guarantees to cover additional costs of water supply in drought periods or costs for a new expansion of supply (waterwork, etc). This provides a disincentive for EYDAP to invest on water saving.

18. The legal framework allows EYDAP to be active in non-core activities (overseas operations, network provision for gas and telecommunications utilities, etc), upon the criterion that this does no incur revenue losses or negative impacts in the provision of the core services. However, there is no regulatory mechanism or standardized assessment framework to judge on these.

Assessment of service and resource management performance

19. The new legal framework maintains, if not intensifies, structural dis-incentives against water saving. Increased water demand is the key source of revenue and given the reluctance of the government to increase prices, it is unlikely that EYDAP will put effort to control demand in the future. Indeed in the report to shareholders, EYDAP emphasizes the prospects of increased revenue from "water sales".

20. Some projects, investments and techniques that combine improvement of environmental performance with potential increase of revenue have been adopted (e.g. enlargement of conveyance and distribution networks, development of hydroelectric plants, recovery of energy from wastewater treatment plants).

21. Business operation and customer services are improving through the modernization of managerial and office infrastructure (adoption of information technology, etc). These processes had already started prior to the equitisation though, with the 1996 PUC law.

22. It is not possible to assess trends in the actual quality of WSS, because there is no formal data/indicator assessment system. The Concession Contract mandated that EYDAP should collect data on indicators such as level of leakage, number of dwellings served with pressure below standards, average time of responding to complaints, days of cuts per year, etc. The data should be compiled in an annual report submitted to the overseeing Ministry plus a summary report available to the public. None of these have taken place.

23. Meritocracy in personnel policy has improved but this is not a result of equitisation. Improvements were a result of broader changes in the legal rules and processes for recruitment in the public sector and the establishment of the Higher Committee for Public Sector Employment (responsible also for hirings in EYDAP). There were no forced personnel firings after equitisation. Top management salaries have increased but within reasonable range.

24. In terms of independence of EYDAP from the State, some improvements are evident (e.g. autonomy in subcontracting and in selecting suppliers) but these were underway since 1996 (after the establishment of EYDAP as an autonomous, publicly owned, private PUC). The Government has still a strong say in the selection of the top management and the company's decisions and policies (e.g. legal procedures against debtors).

Lessons from PI in Athens

L1. There is nothing in the performance of Athens' model of "half-way" privatization to support its transfer to other cities in Greece or abroad. Seen however as a variant of public control, equitisation provides a sound model for compromise in cases where the State wishes to distance itself more formally from the Utility and inviting some private sector participation, while retaining control and avoiding shift to majority private control. This might be a useful compromise when there is popular reaction against privatization, but there is a need to proceed with some reform of the water utility (of course there are also other possible options, such as a public plc or a cooperative, which can equally well lead to reforms in the management of the utility).

L2. The main – presumed and real - advantages of the partial privatization / equitisation were linked to the reduction of direct interference of the government in the operation of the Utility and the separation of regulator and regulated. The question of the critics is why could this not be done without privatization, i.e. through the mechanisms foreseen in the 1996 PUC Law? Is not this a self-admission on the part of the State of a failure to perform appropriately its role? Is this a "keep-it-away-from-me" rationale of governments a sufficient justification to move towards privatization?

L3. The role of the State remains as important after PI as it was before. Delegating responsibility to the private sector, does not absolve the State from the settling of complex trade-offs in water pricing and financing, regulation of the Utility, and investment on environmental and social goals, etc. The emphasis should be on policy reform of WSS and not on PI itself. The degree of private and public control is incidental. Different models will be applicable to different contexts; none will be functional though if the State and regulation systems are weak.

Scenarios

The four scenarios

Table No 12 presents four different, Greece-specific scenarios about PI in WSS in the country. A characteristic title gives the "flavour" of each scenario. The scenarios are characterised and differentiated in terms of:

- Degree of PI in Athens and Salonika's WSS.
- Degree of PI in the rest of the country.
- Broader accompanying policy and regulatory reforms.
- Source of investments.

In a spectrum from the lowest to the highest level of PI, Scenario 3 (public sector dominance) is positioned on one extreme and Scenario 4 (private sector dominance) on the other. In-between is the balanced Scenario 2 and a tendency/business as usual scenario 1, which has relatively more PI than Scenario 2, but considerably less than Scenario 4.

The effort is to avoid "normative" (positive or negative) characterisations of the scenarios (e.g. whether costs are fully recovered or not, whether public participation takes place or not, etc) and to remain purely descriptive at this stage. Then in the next sections, each scenario is separately appraised including:

- An appraisal of the likelihood that it will be realised. This involves a discussion of the contextual factors (drivers) that might support each scenario. The emphasis is on socio-political factors at the national, EU and international levels.
- An assessment of the advantages and disadvantages (strengths and weaknesses) of each scenario with respect to the key assessment dimensions of the PRINWASS project: i.e. economic, social and resource/environmental.
- A discussion of the factors that can contribute to the success or failure of implementation of each PI scenario (opportunities and threats). These are related to, but should be distinguished from drivers; they refer to factors (socio-political, economical, institutional) that will decide the effectiveness of the implementation and the eventual outcomes of a certain PI model.

The appraisal that follows is unavoidably qualitative, and partly speculative. Scenarios are not used as a predictive tool. Thinking about the future is used more as a platform of structuring the alternatives and starting a deliberation over the advantages and disadvantages of different policy options. Ideally, this "deliberation" should be participatory and inclusive and involve a range of stakeholders. However, for the purposes of this paper it remains analysis-based drawing only from the findings from Athens' case study (and partly, insights from the other PRINWASS cases). Needless to state that interpretation of the results and the making of the scenarios is subjective and is affected by the viewpoints of the authors.

Table No 12: Four Policy Scenarios of PI in WSS in Greece for the year 2015

BUSINESS AS USUAL **"Cautious Privatisation, the third way"**	DIVERSIFIED AND BALANCED **"PLCs, the Dutch way"**
Only slight changes have occurred since 2004. The State owns the majority (51%) of the shares of EYDAP and DEYATH. Foreign "strategic investors" (multi-nationals) participate as minority shareholders and have taken over the management of the companies. The utilities of the other big cities of Greece have been also equitised, minority shareholding sold by the State to private/foreign investors and to individual investors through the Stock Exchange market. Small municipal departments and utilities have been unified into larger regional utilities, also equitised and with private sector participation. Majority shareholding of these utilities is shared between the State, and local and regional authorities. The regulatory model followed for PI in EYDAP and DEYATH and the principles of their Concession Contracts has been formalised and applied to all utilities through a Water Services Law. Investment funds are based on revenues from modestly increased prices, public subsidies and individual projects' financing from EU support funds.	A return to the 1996 public plc-based "modernisation of public utilities" law as the basis for WSS utilities' reform has taken place. EYDAP's and DEYATH's ownership structure has not changed since 2004 and the State owns 60% of the utilities, the rest dispersed to individual shareholders, mainly utilities' employees. Legal and contract provisos are strongly enforced. The utilities have greater autonomy from the State, but there is also greater scrutiny and transparency in the assessment of their performance. Existing municipal plcs in the rest of Greece have been modernised. They are autonomous and they operate like private sector companies; municipalities own the companies' shares. Small municipal departments have been unified into larger inter-municipal or regional PLCs. State intervention is minimal and constrained to oversee the commitments of a management and a service contract signed with the director of the plcs. A benchmarking framework is established to compare the relative performance of the utilities. Utilities' duties include the preparation of 10-year investment plans; funding is sought primarily from the EU and the European Investment Bank.

PUBLIC SECTOR DOMINANCE	PRIVATE SECTOR DOMINANCE
"Back to the future, the socialist way"	**"Full fledged privatisation, the Thatcher way"**
The State has renationalised EYDAP and DEAYATH buying back the shares from private investors. 30% of the shares have been given at preferable prices to municipalities in the service areas and 19% to employees' unions. Municipal and union representatives participate in the utilities' boards. The President and the Managing Director are appointed by the Government. A "Social Council" consisting of trade union representatives and other social stakeholders acts as a consulting body to the Board and yields a veto power on predefined critical decisions. The same "corporatised utility" structure is adopted in other cities and towns of Greece and for the inter-municipal utilities that have been formed uniting smaller municipal departments. Municipal authorities are the owners of these utilities, with the exception of some cooperatives, owned by trade unions. Utilities are bound by general administration law and by the rules of a Consumer, a Service and a Resource Management Charter. The State subsidises capital investments and secures low water prices for vulnerable groups.	Majority of the shareholding of EYDAP and DEYATH has been given to private multi-nationals. The State maintains a minority shareholding (30%) and a veto power over some predefined critical decisions of the Board. Regional utilities serving more than 100,000 customers have been formed for the urban areas around the other major agglomerations of Greece. These have also been equitised and the majority of shares belongs to private multinationals. The State maintains ownership and control of water resources and reservoirs. 20-year concession contracts are signed between utilities and the State. A regulatory office at the Ministry for National Economy is responsible for contract negotiation and for monitoring contracts compliance and authorising tariff changes. Smaller municipal departments / utilities have been also turned into private companies and contracted with leases or management contracts to local private investors. BOT schemes are utilised for the financing of new major waterworks (networks, dams, and water/wastewater treatment plants) and repaid from charges.

Scenario 1 - Business as usual: "Cautious Privatisation, the third way"

Likelihood and Drivers

This is a most likely scenario as long as the current socio-political climate does not change.

Some external factors favouring this scenario include:

- Public and trade unions' sentiment against a full-scale privatisation programme and, especially, against multinationals´ control of water utilities remains strong and expressed with reactions whenever such government intentions appear in the media.
- Centrist (centre-right or centre-left) social and economic policies remain dominant. Opposition parties maintain an anti-privatisation and anti-multinationals stance.
- Growth of the Stock-Exchange market and rise of utilities' stock value.
- There is no major shift in international and EU policies concerning water services (i.e. no liberalisation policy).
- Greece's public deficit remains stable; the government does not face pressure to reduce deficit by selling assets.
- General satisfaction with the experience from the equitisation of EYDAP and DEYATH; no major crisis in WSS (e.g. a drought, a contamination incident, etc) favouring a reform of the industry. WSS remaining low in public's concerns.

Strengths

- Politically "neutral": avoidance of social confrontation.
- Distance from direct public interference, with maintenance, however, of some degree of public control.
- Import of some foreign expertise in management, with potential benefits also for environmental/resource management.
- Access to investment funds from the Stock-Exchange market.

Weaknesses

- Postponement of resolution of critical issues; continued State subsidisation.
- Lack of significant improvements in resource/environmental management and service performance.
- "Unstable" model; it has been envisaged only as a step towards more privatisation, rather than a permanent end-state.

Opportunities

- Retreat of government patronage and clientelistic politics; lack of direct interference of the government and municipalities in water utilities.
- Establishment of public utility regulatory structures at a central government level.
- Decentralisation, support of regional economic development and interest of investors in peripheral utilities.

Threats

- Increasing water scarcity, deterioration of water infrastructure and rise of water supply and wastewater costs; pressure for substantial investments.
- Increasing pressure to pay dividends leading to revenue secured through State subsidies.

Scenario 2 - Diversified and Balanced: "PLCs, the Dutch way"

Likelihood and Drivers

This is also a highly likely scenario. Instead of the "equitisation model", the basis for reform in this scenario is the 1996 PUC law for the modernisation of public utilities, which distanced utilities from the State, setting rules that facilitated their operation like private companies, yet maintained public ownership. Private management – public ownership is a model advocated by the Netherlands, where there is successful experience with municipality-owned, privately managed water utilities (Blockland et al, 1999). For Athens and Salonika, this scenario presumes a stabilisation of the current situation. In contrast to Scenario 1 however, where equitisation of EYDAP and DEYATH was an intermediate stage towards more PI and participation of multi-nationals, in Scenario 2 equitised

EYDAP is a public plc operating as a reformed public utility. This scenario is also highly likely for the rest of Greece, where it might be difficult to attract private interest and reforming public utilities might be the only option.

Some external factors favouring this scenario include:

- A growing sense of "failure" in other public utilities (electricity, telecommunications), where majority private ownership was granted.
- Growing evidence against privatisation of WSS in the international arena, and abundance of successful public sector reform cases.
- Lack of interest of multi-nationals or other foreign investors in the Greek WSS market.
- Dominance of social-democratic political parties and policies in EU and in Greece.
- Continuous flow of EU Support funds for Greece.

Strengths

- Private style management, with effective public control (important for social and environmental "services", e.g. affordable water prices, environmental protection, etc).
- Amenable to introduction of "virtual competition" (e.g. benchmarking, etc).

Weaknesses

- If the State is interventionist, utilities might operate more like public departments rather than private companies.
- Ability to finance will depend on whether reform is successful; if not, there is continuous need for susbidisation.
- Techno-managerial, financial and human resource weaknesses of municipal authorities in Greece; lack of tradition of effective State corporations.

Opportunities

- Broader process of modernisation of the Greek public administration and decentralisation of powers to regional and local authorities.

Threats

- Continuous dominance of government patronage and clientelistic politics.
- Failure of modernisation of public administration.

Scenario 3 - Public sector dominance: "Back to the future, the Socialist way"

Likelihood and Drivers

This scenario of return to the 1980s era is highly unlikely, save for some small municipalities where public control and management may remain the norm for the years to come. However, one might envisage such a scenario in a case that there are radical socio-economic changes at the international level or a general "backlash" against neo-liberal policies and privatisation. Some factors that might contribute to such a return to State control, include:

- Rising inequalities and a global socio-economic crisis, leading to a shift from neo-liberal to Keynesian economic policies.
- Rising water prices causing concerns of affordability in Athens and Salonika.
- Notable failure of privatisations in other public utilities.
- Water crises, such as drought, pollution incidents, etc., in privatised utilities.
- Dominance of left-of-centre politics and parties.

Strengths

- Public control, safeguarding of provision of public goods.
- Legitimate, more accountable in times of crisis.

Weaknesses

- Bureaucracy and vested interests' (e.g. construction industry) control.
- Unclear economic and political relations between State and utilities, hindering improvements in management.

Opportunities

- Radical reform and improvement of public administration.
- Growth of the Greek economyc: increase of public expenditures / ability of public sector to finance investments.

Threats

- Nationalisation in a context of a weak and clientelistic public sector, with limited financing capability.
- Polarised party politics affecting public personnel recruitment and utilities' policies.

Scenario 4 - Private sector dominance – "Full fledged privatisation, the Thatcher way"

Likelihood and Drivers

An extreme neo-liberal scenario does not look very likely at this moment; there seems to exist a consensus of the two main political parties around moderate, "centrist" social and economic policies. However, liberalisation/privatisation will be a main "pulling factor" for the more moderate scenarios 1 and 2. A mixture of the three scenarios should be expected, tilting less or more towards Scenario 4 depending on the dominance or not of drivers such as:

- International policies (GATT, EU) for the liberalisation of water services.
- Dominance of neo-liberal politics and political parties in Greece and the EU.
- Successful experience from the privatisation of other public utilities in Greece.
- Public and opposition party apathy towards government plans for further privatisation of WSS.
- Pressure for reduction of public deficit, tight public budgetary policy.

Strengths

- Reduction of direct government intervention and patronage.
- Distance between regulator and regulated.

Weaknesses

- Monopoly abuse / price increases and affordability concerns, if weak regulation.
- Potential for social confrontation, especially in a crisis.
- Weak, State-dependant and corruption-prone private sector in Greece.

Opportunities

- Development of effective regulatory mechanisms.
- Reform of public administration; reduction of corruption.

Threats

- Corruption (especially of municipal authorities).
- Public administration downsizing; inability to perform regulatory role.

Strategies for a Sustainable Future

There are three key conclusions (also of broader relevance) from the findings of the Athens case-study and the exposition and discussion of the alternative scenarios for PI in WSS in Greece:

C1. Political factors and changes are the main drivers of change in the degree of PI in WSS. Future tendencies of PI in WSS in Greece will depend more than anything else on broader socio-political and ideological tendencies, national and international.

C2. No matter what is the degree of PI, the public sector remains central in the delivery of sustainable WSS. Public utilities underperform where the public sector is weak; privatisation regulated by a weak public sector however, is no better alternative. PI is no substitute for the modernisation and strengthening of the public sector in order to carry out its WSS-related functions (regulation, financing, etc).

C3. Focus on PI might distract attention from the key issue of WSS policy reform. This is the case in Greece where policy reform is long overdue and problems accumulate. PI has not advanced responses to critical issues concerning investments vs. prices, regulation of social and environmental goals, etc.

Strategies therefore for a sustainable future should be strategies for the reform of WSS and for strengthening the ability of the public sector's capacity to fulfil its roles. The degree of PI is a secondary issue and should be treated as such. Priorities for reform include:

1. Set up of an administrative unit (directorate, department or office) responsible for a national strategy and for the regulation of WSS.
2. Development of a National Strategy for WSS, outlining key goals (service, economic, social and environmental).
3. Formulation of the Strategy into a Water Services Law defining rights and duties of water utilities and establishing a benchmarking system for the comparative assessment of their performance.
4. Clear definition of service, social and environmental goals and establishment of a monitoring system to assess compliance.
5. Reform of the tariff-setting process. Identification of investment needs and reform of prices so as to recover investment funds, provide incentives for water saving while maintaining low and affordable water rates for vulnerable groups. Replacement of the existing inter-ministerial mechanism for tariff setting by a multi-stakeholder, science-supported process.

6. "Investment" in human capacity development both for public administration and for the water utilities.

7. Establishment of long-term planning processes within the utilities, preparation of investment plans and submission of funding applications to EU or other international donors and banks.

Increasing the degree of PI (i.e. Scenario 4) before satisfying the above conditions and without having established a proper framework for the WSS sector is a risky strategy. A more reasonable strategy would be based on Scenarios 1 and 2 in the short to medium term (i.e. at least for the next decade) with some elements from Scenario 3 for small rural municipalities (i.e. operate as fully public utilities or cooperatives). Once the necessary conditions have been established and a functioning public regulatory and planning system is in place, then PI (leases, management contracts or private sector / multinationals participation in utilities) could be allowed on a case-by-case basis (i.e. no need for a national policy for PI in WSS) through standardised, transparent and participatory processes. A national regulator should control this process (some responsibility should also be given to municipalities owning the networks, depending on the extent that administrative decentralisation and strengthening of local authorities has advanced). An ideal future therefore would consist of mixed models of utilities (public, cooperatives, plcs and majority private), effectively regulated and strategically coordinated by a well functioning public regulatory authority.

Reality does not allow much optimism. Efforts for strategic planning and regulatory control in water resources management and water services in the past have totally failed. Regulatory offices or plans foreseen in legislation were never realised. The 1996 PUC law for example introduced many novelties, which if implemented could have improved considerably WSS in Athens (such as the preparation of 5-year Master Plans by EYDAP, a consumer and services charter with indicators to be assessed in an annual report to the public, etc). All these provisions however were never implemented. Similar was the situation with the 1987 National Law for Water Resource Management. This provided for a national coordinating committee for water resource planning, regional authorities and plans, water allocation mechanisms, environmental standards, licensing of water abstractions and of new waterworks, etc. The decrees that would activate the provisions of the framework law were never activated (Kallis and Coccossis, 2003).

Hence, the real challenge ahead is not simply to produce a new strategy or law, but to establish the structures necessary for the effective implementation of the substance of such policies. This challenge is beyond the strict realms of the WSS sector and relates to the fate of policies to modernise and decentralise the Greek public sector. In turn, these policies will be determined by broader socio-economic and political developments, in Greece and abroad.

Abbreviations

c	centigrade
ha	hectare
hm^3	cubic hectometre
hm^3/yr	cubic hectometres per year
km	kilometre
km^2	square kilometre
lt	litre
MEuros	Million Euros
m	metres
m^3	cubic metre
Mm^3	Million cubic metres
m^3/day	cubic metres per day
mg	milligram
mg/lt	milligrams per litre
mm	millimetre
NE	North East
NW	North West
R&D	Research and development
SE	South East
w/w	wastewater
yr	year

Acronyms

ASEP	High Personnel Selection Committee for the Public Sector
BOD	Biochemical oxygen demand
BOD	Board of Directors
BOT	Build-Operate-Transfer
CSF	Community Support Framework
DEYA	Municipal Enterprises of Water Supply and Sewerage
DEYATH	Municipal Enterprise of Water Supply and Sewerage
of Thessaloniki Inc	
EEDYA	National Committee for the Management of Water and Waste
EIS	Environmental Impact Statements
EKPA	National and Kapodistrian University of Athens
EMU	European Monetary Union
EPEYDAP	EYDAP Assets Public Co.
ESYE	National Statistical Service
ETEVA	Hellenic Industrial Investment Bank
EU	European Union
EYDAP	Athens Water Supply and Sewerage Inc.
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GNP	Gross National Product
IBC	International Broadcasting Convention
KEPE	Centre for Economic Planning Research
MDEV	Ministry of Development (see YPAN)
MESPPW	Ministry of Environment, Spatial Planning and Public Works
NIGS	Networks and Installations General Secretariat
NTU	National Technical University
OECD	Organisation for Economic Co-operation and Development
OAP	Athens' Organisation for Sewerage
PI	Private involvement
PPP	Programme for Public Investments
PUC	Public Utility Company
SGS	Sewerage General Secretariat
SIWI	Stockholm International Water Institute
SKAA	Athens' Waste Water Treatment Plant
TEE	Hellenic Technical Chamber
WGS	General Secretariat for Water Supply
WSS	Water Supply and Sewerage Services

WTUs	Water Treatment Units
YBET	Ministry of Industry, Research and Technology
YPAN	Ministry of Development

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