

WATER MANAGEMENT SERVICES REGULATION IN LATVIA: PRINCIPLES AND DEVELOPMENT TRENDS

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In this paper, the author studies water supply tariffs setting schemes, the structure of the tariffs, and other issues related to this process. The target was set to study water supply tariffs regulation principles both in Latvia and in the European Union aiming to set forward solutions for optimisation of tariff-setting processes.

The following tasks were set forward for reaching the target:

- 1. studying theoretical aspects of public utilities regulation and the setting of tariffs,*
- 2. evaluation of tariffs structure in Latvia and Lithuania,*
- 3. finding out and analysing the principal factors of tariffs increase,*
- 4. elaboration of a new solution for the optimisation of the tariffs setting process.*

Scientific research methods and materials:

- 1) scientific deduction method when analysing theory on the issue studied;*
- 2) scientific induction method when summarising study research results, evaluations, conclusions, suggestions;*
- 3) dynamic time series analyses aiming at finding out development progress and rate of processes, facts and costs;*
- 4) graphical method when visualising data surveyed and executed;*
- 5) data grouping and dynamic analyses method has been applied for the analyses of the statistical data;*
- 6) evaluation of computer programmes to select the most appropriate for reaching the target set.*

This research paper consists of an introduction, four interrelated chapters, conclusions and proposals. The first part of the paper describes the specificity of monopoly market and the necessity of regulation of public services. In the second part of the paper the Author analysis the regulation of public utilities in water management in Latvia and Lithuania, the structure of water supply tariffs is being compared and analysed. In the third chapter the process of determining water management tariffs is being researched, in the fourth chapter – problems related to the regulation of water management tariffs have been identified. The Author mentions implementing the ESF projects as one of the reasons for tariff increase. Their impact on tariffs the Author will evaluate in her future research. Another problem that has been identified is the complicated revision and analysis process of tariff, which is rather long and demands both human and time resources. To solve the problem the Author proposes to introduce a new innovative method – the visualisation of geo-information that would allow to compare similar enterprises – public utilities providers (on similar criteria) making the process of tariff evaluation faster.

Scientific research and publications by Latvian and foreign scholars, data by the Ministry of Environmental Protection and Regional Development of the Republic of Latvia, information by tariffs regulatory institutions in Latvia, Estonia, Lithuania, theoretical and analytical literature as well as other information sources listed under the List of Literature have been used for the research.

As a result of the study the Author suggests to use the software of geographic information system for the optimization of water tariffs comparison, evaluation and setting processes that would enable for visualisation option.

Keywords: *regulation, tariffs, monopoly, water utilities, geographic information systems.*

Introduction

Regulation of public utilities had already been introduced in Latvia in 2001, however, relatively little research has been performed in this area. Few scientific publications on the problems of regulation of public utilities were aimed at the optimization of the operation of monopoly companies in the country, proving the irregular and fragmentary research carried out. E.Karnītis (*E.Karnītis*), I.Steinbuka (*I.Steinbuka*), J.Binde (2007) wrote about the situation in the public utilities regulation field in Latvia. (Jurgelāne, 2011)

Strong natural monopolies have been formed in all the countries; most of the enterprises are state monopolies where the owner of the company is also the lawmaker and

the manager. (Gabrāne, 2005) Unfortunately, operation of the monopoly is frequently insufficiently effective and the proportion of the quality of services provided and the price in many cases is unsuitable to the economic and social needs of the state. The state abates direct interference of politicians in economical processes by the formation of a public utilities regulatory system.

In the period from 2004 until 2008 prices for products and services boosted in Latvia and that provoked rapid inflation. In 2012 inflation has fallen below 3%; however, the population of Latvia perceives the public utilities prices as high. In order to most efficiently monitor and control price alterations, each

country makes its own regulatory system. (Jurgelāne, 2009) Increase in prices was mostly affected by the increase of administratively regulated prices. The price depends on the state economic situation, state history, mentality, political situation and other factors. To avoid the threats of uncontrolled growth of inflation, such a chain of impacts makes alterations of regulatory prices a precisely evaluative issue. Hereinafter is the fact that in Latvia by entrusting the regulation of the mentioned fields to a certain institution, the Public Utilities Commission (PUC), the responsibility of this institution has been raised in order to control of the growth of total prices. Operation of PUC as a unified multi-sector regulator allows one to analyse the interrelationship and interaction of price changes of separate utilities. (Jurgelāne, 2011). In this article, the author addresses the main principles of setting the water-handling facilities tariffs in Latvia and worldwide. The target was set to study water supply tariff regulation principles both in Latvia and in the European Union aiming to set forward solutions for the optimisation of tariff setting processes.

The following tasks were set forward for reaching the target:

1. studying theoretical aspects of public utilities regulation and the setting of tariffs,
2. evaluation of the tariff structure in Latvia and Lithuania,
3. finding out and analysing the tariff structure in Latvia and Lithuania, its principal components,
4. elaboration of a new solution for the optimisation of the tariffs setting process.

Scientific research methods and materials:

1. scientific deduction method when analysing theory on the issue studied;
2. scientific induction method when summarising study research results, evaluations, conclusions, suggestions;
3. dynamic time series analyses aimed at finding out development progress and the rate of processes, facts and costs;
4. graphical method when visualising data surveyed and executed;
5. data grouping and dynamic analyses method has been applied for the analyses of the statistical data;
6. evaluation of computer programmes to select the most appropriate for reaching the target set.

Monopolies, providers of public utilities and the need for regulation

Feasible institutional solutions for the regulation of monopolies and other public utilities has been an urgent and widely discussed issue in the academic media. One of the ways of promoting the development of national economy is liberalisation of goods and services. Though due to economically grounded reasons, competition does not exist in some branches because companies operate there in the condition of a natural monopoly. Due to the notable investments and complicated infrastructure, only one big enterprise is able to render services to a wide range of consumers.

Various investigators in scientific publications (in chronological order) have disclosed the regulation of public utilities and the problems related, *K.Bakker*, *R.Bluffstone*,

B.Fuhr, *P. Josep* (1989), *M.A.Crew* (1994), *H.Kanitz* (1995), *R.Kraemer* (1999), *P.R.Kleindorfer* (1996, 2004), *R.M.Harstad* (2004), *C.K.Rowley* (2004), *I.Vogelsang* (2004), *C.S.Fernando* (2005), *C.Liston* (2005), *D.L.Weisman* (2005), *J.Wackerbauer* (2006) etc.

The PUC in Latvia is independent (both politically and economically). Similar to Latvia, regulation is being performed by a centralised institution also in Lithuania and Estonia. In Lithuania it is the National Control Commission for Price and Energy (NCCP) and the Estonian Competition Authority in Estonia.

In Latvia the PUC performs the following functions:

- licenses the provision of public utilities;
- defines methodologies for tariff calculation;
- determines tariffs;
- promotes competition in regulated sectors;
- protects the interests of consumers;
- performs preliminary out-of-court examinations of disputes.

Hereinafter the Author shall highlight one of the functions, that is the setting of tariffs. The European Union (EU) applies specific principles for the regulations of public utilities:

- tariffs have only been regulated in case of lack of competition in the market,
- each country is free to select a tariff regulatory mechanism,
- regulation of tariffs varies from ex-ante to ex-post regulation. (Gabrāne, 2006)

EU policy does not determine what tariffs should look like, although economical principles justified by member states notify that in the case of regulatory tariffs (prices) it is significant for the tariffs of each product to comply with the costs. The development policy aims of relevant fields declared in Latvia correspond to the principle trends of the EU and at the international level.

Alongside those mentioned, the following principles have been observed in Latvia:

- the need for regulation to determine historically formed monopoly companies in Latvia,
- the ex-ante approach is used in setting tariffs, where tariffs are approved prior the accounting period.

When choosing the principles for tariff regulation, the different political and economical status of each country should be considered.

The following data is available on water companies regulated in 2012:

- The Public Utilities Commission (Latvia) regulated 170 water management companies,
- Under the Estonian Competition Authority regulation is 70 water companies,
- In Lithuania the NCCP regulates around 98 companies.

The companies that are not registered with the Enterprise Register as merchants are not subject to regulation. Therefore, several local governments tend to form agencies to render services in order to stay outside supervision of the Commission. The Author's experience shows that this could be risky since insufficient investments have often been made in the growth of these companies, maintenance and improvement of the environmental status. The social and economic situation of the current period is considered instead of the economic

cost principle when setting tariffs. Many local governments subsidize such companies so that they do not alter tariffs. It causes a situation where all the service consumers have been subsidized, even those who could have paid for the service. Even more, taxes paid by the residents have not been used for all the residents of the local government but only for those receiving the services.

Specific criteria make a basis for setting the tariffs (proportion of volumes of water produced and sold, profitability etc.). This has been done for the tariffs to be economically grounded. The setting of tariffs should be rated as a subjective process where diversiform interests of parties are balanced. The enterprise (service provider) with its aim of gaining profit stands on one side and the consumer is on the other side who wants to receive cheap and good quality service.

Analyses and comparison of the situation in Latvia and Lithuania

The Author has carried out a study of the principal components of water supply tariffs. Pictures No.1 and No.2 show the results.

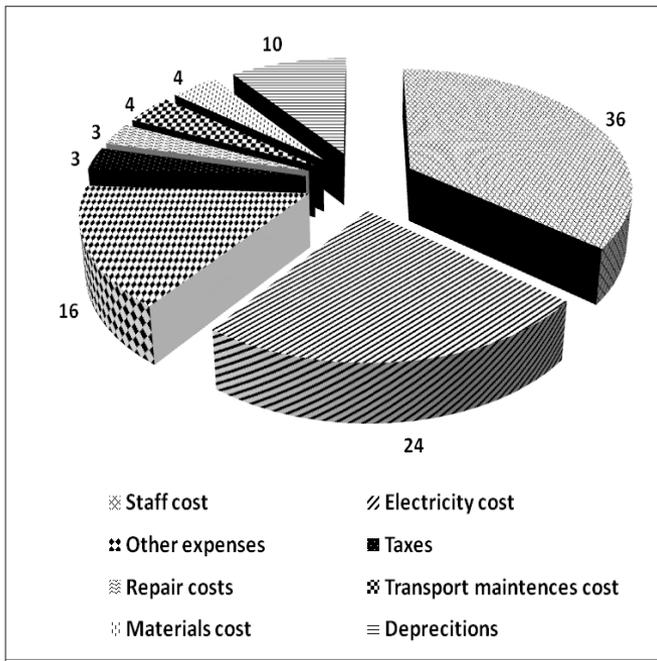


Figure 1. Cost structure of water supply and waste water treatment PUC Latvia (PUC, 2012)

Source: PUC, 2012

In Latvia wages (36%) and energy costs (24%) make the most of the water tariff. A tiny part is covered by costs for taxes (3%), system renovation (3%), materials (4%) and transport maintenance (4%). The situation in Lithuania is a bit different (see fig.1).

In figure 2, one can see that wages (41%) and depreciation of fixed assets (23%) take most of the tariff. Energy makes 14% of water tariff costs. Depreciation in the Lithuanian water tariff takes a bigger part than in Latvia (16%), materials are 6% in Lithuania and 4% in Latvia.

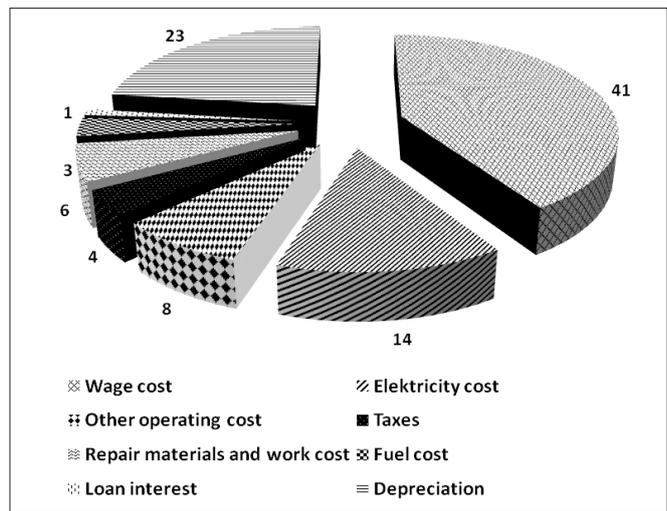


Figure 2. Cost structure of water supply and waste water treatment NCCPE Lithuania (NCCPE, 2012)

Source: NCCPE, 2012

During this research the Author deduced that several water utilities perform their duties with low profitability or even without any profitability (see table 1). It allows for the conclusion that no funding has been accrued for further development and new investments, which exposes threats for the occasions of breakages or expensive repair works.

Table 1. Water utilities tariffs in Latvia (year 2011/2012, LVL/m3) (%)

Region	Territory	Tariffs		Profitability	
		Water	Waste water	Water	Waste water
		LVL/m ³	LVL/m ³	%	%
Rīgas	Pļaviņas	0,65	1,01	1,0	1,0
	Jūrmala	0,63	1,20	7,0	7,0
	Gārsene	0,50	0,84	0,0	0,0
	Lielvārde	0,65	0,77	7,0	7,0
	Vecumnieki	0,45	0,73	7,0	7,0
Kurzemes	Priekule	0,49	0,83	3,0	3,0
	Kandava	0,56	0,77	0,0	0,0
	Dobele	0,61	0,92	7,0	7,0
	Grobiņa	0,58	0,30	7,0	7,0
	Skrunda	0,53	0,66	5,0	5,0
Latgales	Dagda	0,57	1,04	6,9	6,9
	Zilupe	0,20	0,51	5,0	5,0
	Viļaka	0,58	0,71	0,0	0,0
	Viļāni	0,44	0,92	1,5	1,5
Vidzemes	Eglaine	0,32	0,68	6,5	6,5
	Rūjiena	0,57	1,03	0,0	0,0
	Ērgļi	0,72	1,12	7,0	7,0
	Gulbene	0,73	0,91	7,0	7,0
	Limbažu novads	0,71	0,97	2,0	2,0
	Madona	0,84	1,04	6,2	2,2

Source: by the Author following PUR data, 2013

Basic methodological principles of tariff-setting encompass precise and objective economic calculations, methods, and principles.

The tariffs setting process

The task of the regulatory company is separating regulatory activities within accountancy, i.e. isolation of costs. Restructuring of the accountancy is a very labour-consuming process and the enterprise is not very willing to do it since this requires knowledge, time, and extra costs. Nevertheless it makes operation of the company transparent and easily controllable. The company works out and submits to the commission the tariff project based on the cost extension principles and following the tariff-setting methodology elaborated by the commission. If the project has been worked out in line with methodology, the regulator evaluates it in its terms.

The process of tariff setting and approval is rather long (see fig.3) and depends on several factors. Specific criteria serve as a basis for setting the tariffs (ratio of produced and sold volumes, profitability etc.). This is done for setting economically justified tariffs. Setting of tariffs should be estimated as a subjective process where the diverse interests of different parties are balanced. The enterprise (provider of a public services) is on one side with its interest to gain profit and the consumer is on the other side and wants to receive cheap and qualitative service.

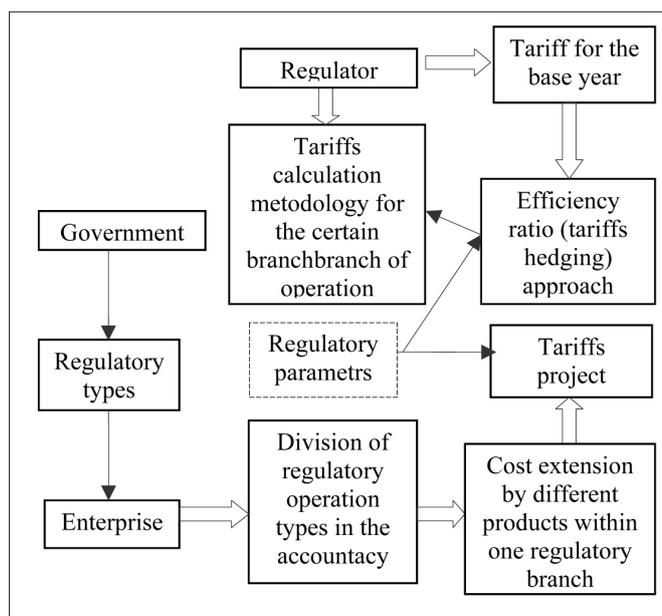


Figure 3. Tariffs setting process

(Source: Šteinbuka, 2003)

Tariffs for these utilities are set separately for each of them. Tariffs have been calculated considering average annual volume of water delivered and volume of waste water in cubic metres. The said amount is defined based on the volume of water actually delivered in last calendar year, the volume of waste water discharged, the projected volume of water to be delivered in the current year, and the projected volume of waste water to be discharged in cubic metres.

Problems identified in the regulation of water utilities

The Author holds the view that the available EU funding causes problems in the process of setting the tariffs. Water tariffs started to rise significantly due to the financing part

(30% of project cost) needed for a large investment project funded by the EU.

In the field of public utilities there is a constant need for significant investments for the formation and further development of infrastructure. EU funding has been used for the improvement of water systems also in Latvia. For the development of water management infrastructure in populated areas with a population under 2000 within the national programme for years 2004-2006 there has been invested in total (allocated for implementation) 31.5 million EUR, inter alia 23.6 million EUR from ERDF, and 7.9 million EUR from state and local governments budgets. Feasible ERDF funding in Latvia in the period 2007 to 2013 in populated areas under 2000 inhabitants is planned to equal 143.49 million EUR, hence Cohesion funding in water management projects in agglomerations above 2000 inhabitants equals 419.5 million EUR (I.Jurgelāne, 2011).

Table 2 shows data by the Ministry of Regional Development and Environmental Protection of the Republic of Latvia on the available funding for the planning regions for the period from 2007 to 2013. It can be concluded that the bulk of the funding will be forwarded to the Latgale planning region (34.43 million EUR), hence the least will be allocated to the Kurzeme planning region (22.96 million EUR). Though for the data to be objective they have to be adjusted with regards to the number of populated areas in each planning region and their specific weight in the entire territory of Latvia. (Environmental Investment Fund of Latvia, 2009).

Table 2. ERAF funding for water projects in Latvia (millions EUR) in the period from 2007–2013

Planning region	Phase I			Phase II		Phase III	
	2007	2008	2009	2010	2011	2012	2013
Rīga	3.0	3.2	3.4	3.7	3.92	4.1	4.3
Vidzeme	3.1	3.41	3.6	3.9	4.13	4.4	4.6
Kurzeme	2.6	2.87	3.0	3.3	3.48	3.7	3.9
Zemgale	3.8	4.13	4.4	4.7	5.00	5.3	5.6
Latgale	4.0	4.31	4.6	4.9	5.22	5.5	5.8

Source: data by the Ministry of Regional Development and Environmental Protection of the Republic of Latvia.

Since Latgale planning region has the highest number of populated areas (see table 3.) (140 or 24%), therefore this region has a grounded right to receive the biggest part of funds or quota. There are only 95 populated areas (16%) in the Kurzeme planning region and therefore it has received the lowest quota (33 million EUR).

The Author concludes that the problem related to the economical standing of many states is finding the mid way and the best solution to meet the needs of all parties, for water management companies to obey environmental protection requirements (since these are remarkable costs), paying capacity of people (it is low in Latvia), guarantee investments and development for the service provider (these costs will be included in the tariff) and the cost for the services (tariff). Nevertheless the Author holds a view that tempo of comparison

of data collected, data processing and analyses is one more problem faced by public utilities regulatory institutions.

Table 3. Comparison of volume of quota of water projects and number of populated areas and specific weight in the planning regions of Latvia. (2007–2013)

Planning region	Number of populated areas*	Specific weight of populated areas *, %	Quota, EUR
Rīga	105	18	25 828 881
Vidzeme	114	19	27 263 818
Kurzeme	95	16	22 959 005
Zemgale	134	23	33 003 570
Latgale	140	24	34 438 507
Total	588	100	143 493 781

* – with population 200–2000.

Source: data by the Ministry of Regional Development and Environmental Protection of the Republic of Latvia

Since the information on water management companies has been stored in different forms of MS EXCEL tables, it is not accessible and makes it difficult to compare it.

To improve the situation the Author suggests the introduction of a geoinformation system enabling us to visualise the current water management status. The data would be divided, grouped, and visualised so that the staff could easily acquire the information necessary, compare it and request additional information from companies if needed. The introduction of the visualisation system would make it easier and faster for the decision making process.

Steps (or stages) needed for the introduction of a geoinformation system:

- Elaboration (downloading) of the map of Latvia with necessary options for data input;
- Highlighting the map with colours for the locations of Latgale, Kurzeme, Rīga and Vidzeme regional territories of the Public Utilities Regulator (address, telephone numbers of persons responsible);
- Input of water management companies data.

The following information on each water company should be inputted in order for the data be comparable and usable in water tariffs regulation process:

- Number of customers;
- Water and waste water tariff;
- Volume of water delivered in m³;
- Collected and treated volume of waste water in m³;
- Water lost in m³;
- Annual turnover in LVL;
- Profit or loss in LVL;
- Number of employees;
- Length of network in km (map attached);
- Amount of water towers, treatment plants,
- Population in the certain populated area.

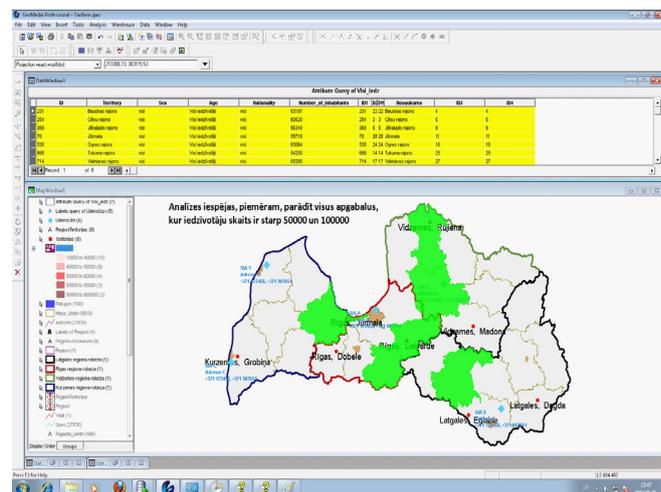


Figure 4. Visualisation picture by geographic information system (made by the Author)

The Author thinks that application of visualisation programmes shall enable regulatory institutions of different states to compare data and make decisions in a much shorter period.

The author's research on this topic will continue in the future.

Conclusions

1. Since the providers of water utilities are monopolies these services have to be regulated by a specifically formed institution. In Latvia it is the Public Utilities Commission, in Lithuania it is the National Control Commission for Price and Energy (NCCP), and the Estonian Competition Authority in Estonia.
2. The Author concludes that the problem related to the economical standing of many states is finding the mid way and the best solution to meet the needs of all parties, for water management companies to obey environmental protection requirements (since these are remarkable costs), paying capacity of people (it is low in Latvia), guarantee investments and development for the service provider (these costs will be included in the tariff) and the cost for the services (tariff).
3. The tariff structure of water management in Latvia and Lithuania is quite similar and its biggest part is comprised of labour payment, however, the second biggest tariff heading is electricity expenses in Latvia, but in Lithuania – expenses of capital assets depreciation.
4. The profitability of 0-7% is included in tariffs. If profitability is 0%, the enterprise has no possibility to invest in its development and improvement of quality of utilities.
5. EU projects are being implemented in water management sector in Latvia and this impacts tariff structure. Research will be continued in this field.
6. Since the information on water management companies has been stored in different forms of MS EXCEL tables, it is not accessible and makes it difficult to compare it.
7. To improve the situation the Author suggests the introduction of a geoinformation system enabling us to visualise the current water management status. The

data would be divided, grouped and visualised so that the staff could easily acquire the information necessary, compare it, and request additional information from companies if needed. The introduction of the visualisation system would make it easier and fasten the decision making process.

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