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FINANCIAL ANALYSIS OF WATER SECTOR IN ALBANIA

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Abstract

58 utilities that provide water supply and sewerage service are currently operating in Albania (DPUK, 2014). Each of them reports every three months to the General Directorate of Water Supply and Sewerage System (DPUK) the aggregated data related to financial, operational and organizational indicators. On the basis of the ongoing performance of these parameters, Water Supply JSC benefit subventions from the state budget, mostly to cover the high energy bills or depreciation cost. Also, high operational costs as a main determinant in the ability of the utilities to get a bank loan and the numerous uncollected water bills make it difficult for them to overcome financial problems.

This paper is using the annual aggregated data of 2013 and the first half of 2014, for the 58 utilities that operate in the water sector, to make an analysis of the performance indicators and to identify the cost structure. As a result, they have had financial losses at the end of the fiscal year, which have led to lack of competitiveness in the market, providing unlimited service drinking water and sanitation for all population.

Keywords: water supply, cost analysis, optimal funds, uncollected water bills, operational costs

Topic Groups: Business strategy, Microeconomics, Organizations and financing.

1. INTRODUCTION

As an important resource, drinking water has become a significant debate being one of the EU directives, which considers it a human right. Also, climate change and demographic trends have reduced these resources. We are facing with the situation that some regions in the world are affected by a lack of safe access to clean water, while others are wasting it in the name of development and industrialization.

Albania, as one of the countries of Eastern Europe, is known for large quantity of natural resources of drinking water, enough to meet the growing needs of the population. However, current high rates of population growth and migration from rural to urban areas have brought the need for better management of water resources. Currently are operating 58 utilities that provide drinking water and sanitation services, trying to meet the needs of the population in their service area, but their inadequate financial parameters have been far from optimal. What

unite these utilities are the common challenges that they are facing. According to the reports, it appears that the most obvious problem is the mismanagement. The overall level of losses in the network goes to the extent of 67% (DPUK, 2013). With regard to the investments factor in this sector, investments made in water sector are recently 3 billion ALL, while in sewerage around 2.5 billion ALL and in implants 611 million ALL. Development Fund, during 2012-2013, has provided 9 million Euros for general investments and 6 new water connections in the network.

From all the water resources (about 316 natural resources), only 93 have a gravity system. The rest of them need a mechanical lifting that consumes a lot of energy, which increases the costs of the utilities. Referred to the second way of obtaining drinking water, are produced about 160 million m^3 per year. If we calculate water demand for the entire population, it will not be more than 217 million m^3. Current production is higher than the amount of drinking water required by the population and only 33% of produced water is used efficiently. So, from the total water production of 270 million m^3 per year, it turns out that the non-revenue water is 181 million m^3.

Non-revenue water (network losses) is due to the depreciation of the network, technical reasons (power pumps), the lack of production and consumption of water, uncollected bills, etc. The collection rate is only 82%, still a problem because of the low rate of payment. Another issue is related to rural areas, where about 97% of wastewater is not being treated properly. Subventions mostly cover losses from water mismanagement. Also, in terms of providing continually drinking water service, the average water supply hours is 10.8 hours per day, knowing that the standard in Western Europe must be 24 hours per day. The service area of these utilities has less than 50,000 inhabitants (World Bank Report, 2010), so under these circumstances economies of scale don't exist (Padeco, 2009).

Regards to the population covered by water supply, the total figure is 80.6% (DPUK, 2013), in urban areas 88%, and in rural areas 63%. The most alarming figure is recorded for sewerage service; coverage ratio is 63.5 % (83.1% in urban areas and 4.8% in rural areas). Indicators for the sewerage service show that the investments are done more in the water sector than in sanitation services. Although, in the last 2-3 years, these percentages have started to change, by providing more investment opportunities in sewage and wastewater treatment plants. The cost structure of WSSU is as following: the total operational cost is composed by labor cost (around 31%), followed by energy cost (22%), depreciation cost (17%) and materials cost (12%). These elements enlarge the cost structure; put pressure on the state budget to allocate subventions to cover losses (8% of Total Operational Cost for 2012).

2. LITERATURE REVIEW

The table below summarizes papers and works used as a reference point for this article.

Table 1: Used Literature

Authors	Topics	Conclusions
Mergos, 2005	Competition in water supply sector	"…there is a difficulty to introduce competition in water supply sector…this sector has different characteristics that lead in a natural monopoly form of organization".
Garcia and Thomas,2001	Economies of scale in water sector	Aggregation of WSC and regionalization it's an option for achieving economies of scale, in developing countries.
Tynanand & Kingdom,2005		
McFarlane,2003		
Urio P., 2010	"Public Private Partnerships: Success and Failure Factors For In-Transitional Countries"	Public Private Partnerships is a contractual deal between private sector and public sector in order to ameliorate basic activities such as: projection, construction, financing and operating.
Kingdom, 2005	Regionalization	"…the main reason for regionalization is to achieve economies of scale by serving a large number of people and the ability to access private sector financing or funds from international institutions that are encouraged to finance based on benefits coming from economies of scale".

Source: The author

The water supply and sanitation sector differs from other sectors, such as telecommunication and electricity. The literature states the lack of possibilities under which this sector operates as competition market due to one characteristic: the total cost of private connections is part of total cost of water production, leading to the form of natural monopoly (Mergos, 2005).

Urio (2010) affirmed that the competition isn't possible in the water sector; different entities don't build water plants or sewerage connections in the same city or area. Quiggin (2011) affirmed that the most common form of organization of WSSU is public ownership.

Economies of scale are another problem of the sector, debated in the literature. Kim and Clark (1998) in USA and Garcia and Thomas (2001) in France have conducted studies on this sector. Their studies are econometrical studies, where linkages between company size, water

produced volume and economies of scale are identified. As optimal measure of company size was identified the number of connection in water and/or sewer.

Studies about the Water and Sanitation sector in Albania are very poor. Many reforms are made recently, bringing the necessity to compare the performance indicators known as "Benchmarking". This kind of study serves as a helpful manual for drafting policies, in order to improve all financial and organizational indicators of the sector.

3. THEORETICAL MODELS

In Albania, WSSU have registered financial losses each year, while large operational costs put pressure on state budget in terms of the subventions that they need periodically to cover these costs. So, the cost structure of WSSU isn't optimal at all. This affects their decentralization process, their financial autonomy and consequently their competitiveness in the sector of water and sanitation services.

According to the National Strategy of Water and Sanitation Services (2011-2017), in order to achieve their financial autonomy and sustainability, they should cover totally the operational costs and then the total activity costs.

Assuming that various exogenous factors affect Operational Cost, we can state the following statistical models:

Model I $$TOC_i = \beta_0 + \beta_1 WMV_i + \beta_2 WPV_i + \varepsilon$$ (+) (+)

Model II $$TOC_i = \beta_0 + \beta_1 TPWS_i + \beta_2 EPSC_i + \varepsilon$$ (+) (+)

Model III $$TOC_i = \beta_0 + \beta_1 TLC_i + \beta_2 TEC_i + \beta_3 TD_i + \beta_4 TMC_i + \varepsilon$$ (+) (+) (+) (+)

Table 2: Variables

Regression Models	Dependent Variables	Independent Variables	Description of independent Variables
I	OC_i Operational Cost (‘000 ALL)	WPV_i	Water produced volume (‘000 m3)
		WMV_i	Wastewater metered volume (‘000 m3)
II		$TPWS_i$	Total number of people served with water supply services (‘000)
		$EPSC_i$	Estimated total number of people with sewerage connection (‘000)
III	TC_i Total Cost (‘000 ALL)	TLC_i	Total Labor Cost (water + sewer, ‘000 ALL)
		TEC_i	Total Energy Cost (water + sewer, ‘000 ALL)
		TD_i	Total Depreciation Cost (water + sewer, ‘000 ALL)
		TMC_i	Total Material Cost (water + sewer, ‘000 ALL)

Source: Author

4. METHODOLOGY AND EMPIRICAL RESULTS

4.1 Purpose of the study

Using three regression models, the paper aims to identify the determinants of operational cost of water utilities and their marginal effects in order to reduce the operational costs, and then the total costs. This would lead to real possibilities to reduce losses and obtain the financial autonomy from the subventions of state budget.

4.2 Methodology

Secondary data are used from DPUK (General Directorate of Water Supply and Sewerage System). The data consist in all indicators of 58 subjects that operate in the sector, for 2013 and the first half of 2014. Econometric approach for obtaining quantitative results is based on the analysis of variance and regression analysis of linear model using OLS technique.

4.3 Model and results

The article is based in the following formulated hypothesis and variables:
H_1: The reduction of water losses in the network will reduce the operational costs of WSSU (water supply and sanitation utilities).
H_2: Higher the size of served population with water and sanitation services, lower operational costs of WSSU.
H_3: Labor cost, energy cost, depreciation and material costs affect total costs of WSSU.

Table 3: Regression models

Regression Models	Dependent Variables	Independent Variables	β_i Coefficients	Model´s Significance	Adjusted R^2	F Value
1	OC_i	WPV_i	+.965*	.000	.930	355.479
		WMV_i	+.934*			
2	OC_i	$TPWS_i$	+.985*	.000	.970	862.975
		$EPSC_i$	+.959*			
3	TOC_i	TLC_i	+.450*	.000	.997	4457.20
		TEC_i	+.367*			
		TD_i	+2.435**			
		TMC_i	+.263*			

*Note: *Significant at .000*
***Significant at .0001*
Source: Author´s calculation

According to the results reached through regression model, the preliminary empirical results are as follows:

- Reduction of technical water losses from 67 % (the actual level) to 40 % (the target level) (Source: WRA Sector Performance Report, 2012) will reduce the volume of water produced by 42.4 % and operational costs is decreased by 40.916 % (Hypothesis I: VERIFIED)

- If population served with water and sanitation services increases with 1% (or 10%), the total operational costs increase with 0.985% (or 9.85%), less than the increase of population , (economies of scale) (Hypothesis II: VERIFIED)
- The coefficient of determination R^2 of the third model is high, which shows that 99.7% of operational cost variability is explained by the variables such as: labor cost, material cost, depreciation and energy cost. Reducing these elements of costs, will reduce the total operational cost of WSSU. (Hypothesis III: VERIFIED)

4.4 Limitations of the model

Econometric analysis is used in order to estimate expected results but without giving any other detail in methodological explanations of various tests performed for validation and specification of models. The number of independent variables taken under consideration is limited. The next purpose is to compare these results over time or to compare the situation with other countries of the region.

CONCLUSIONS

1. Wastewater treatment process is still far from the standards, (97% in rural areas);
2. Financial performances are poor, the utilities are reporting losses every year;
3. There are high levels of water losses, often justified by WSSU (67% of total volume produced);
4. The water production and water sales measurement is very low and not accurate (the figures are evaluated not measured, because there are illegal connections in the network, or identified customers);
5. Not everyone (population and businesses) pay for the services they receive;
6. The investments are made without performance-orientation;
7. There are also licensed companies that do not have professional skills, their managerial staff lacks of experience in the sector;
8. There are high labor and energy costs, often unjustified;
9. The organization and management of the sector is inefficient;

DISCUSSIONS

WSSU should reduce their operational costs in order to obtain financial autonomy from the state budged subventions due to the mismanagement of water resources since 67% are losses in network. Old pipes and implants should be considered to be replaced and it should be taken in consideration that there is a low collection rate; the water should be seen as a product with a price. Another fact of water cycle is the treatment of wastewater that is very low, (97% in rural areas). The main activity of WSSU should be obligatory in terms of the water treatment (wastewater), they have social responsibility to the environment and population. Finally WSSU should be competitive in the market, minimizing the phenomenon of bottled water usage from the population.

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