



TAKING EVERY DROP INTO ACCOUNT

Testing Tariff Setting Methodology for
Water and Wastewater Services
in Bosnia and Herzegovina








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2 July 2020

A large, artistic photograph of a water splash is at the bottom of the page. The water is clear and blue, with many small bubbles and ripples, creating a dynamic and fresh visual effect.



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The UNDP GoAL-WaterS (Governance, Accountability and Learning for Water Sustainability) programme supports equitable, efficient and environmentally sustainable use and protection of freshwater and marine resources. GoAL-WaterS builds on United Nations Development Programme (UNDP) close working relationships with country governments and partners. The support is delivered through UNDP Country Offices and partners, with strategic management and technical support provided through the UNDP-SIWI Water Governance Facility (WGF) and UNDP's Water and Ocean advisors.

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EXECUTIVE SUMMARY

System of water supply and wastewater management services provision in Bosnia and Herzegovina (BiH) is highly decentralised. Normative framework designates local governments as principally responsible for delivering these services. In practice, water supply and wastewater management services in local communities are provided by local publicly owned companies. These companies are facing common issues dealt by majority of state owned enterprises in BiH such as: weak corporate governance, loose regulation, political control, ineffective monitoring over public utility companies' operational and financial performance, etc.

Water utility service provision in BiH faces additional challenges. Central among those pertains to the defective systems of tariff setting. Due to political considerations, tariffs are determined without observing principles that would enable coverage of all costs related to service provision. For this reason many service providers may suffer financial losses and have to deal with underinvestment in maintenance and development of the distributive network.

In 2015 United Nations Development Programme (UNDP) developed the 'Tariff Setting Methodology for Water Supply and Sewerage Services in Bosnia and Herzegovina' which offers viable solution to a defective normative framework and to a number of challenges related to practical operation of Water utility companies.

In 2016 and 2017 four municipalities, two in Federation of BiH and two in Republika Srpska, were selected for a pilot testing of the Tariff Setting Methodology. The primary goal of the exercise was to evaluate performance of utility companies in respective municipalities based on the application of the Methodology and to estimate a 'real' tariff that would take into account all real service-associated costs and investment plans. Secondary goal was to evaluate the level of political support such policy may receive from local authorities as well as arguments in favour or against a number of policy options and general features of the Methodology.

The exercise identified a number of issues that need to be tackled if the Methodology is to be applied in a sound and consistent manner. At the moment, not all companies have sufficient human and technical capacities for swift introduction of the Methodology and this needs to be addressed in any future advocacy efforts toward its inclusion into regulatory framework.

Improvements are needed in accounting practices – changing the way costs are recorded and monitored and how depreciation is performed and calculated. Improvements are also needed in terms of optimising labour force. This further affects investments in maintenance and development which is one of the major issues water service companies are faced with.

Certain level of political support for introducing the Methodology seems to exist. On the other hand, long standing 'populist' approach to tariff setting is not likely to change overnight. Still, without full-fledged backing on behalf of local authorities for introducing new principle based methods, no far reaching effects may be expected.

The exercise also showed that the application of Tariff Setting Methodology and its principles would require changes in current tariff levels in all municipalities. However, The required change varies significantly. In some cases required changes would be minimal while in others adjustments would need to be significant. These findings further underline the fact that present models of tariff setting in many cases clearly leads to unsustainable operations. Without subsidy from income from other service water service provision would cause loses across the board.

If there are no changes in the way companies are governed there is a serious threat for a long term sustainability of companies and services and a great risk for local populations dependent on these services.

List of abbreviations

BAM	Bosnia and Herzegovina Convertible Mark
BiH	Bosnia and Herzegovina
CAPEX	Capital expenditure (investment)
EC	European Commission
FBiH	Federation of Bosnia and Herzegovina
IAS	International Accounting Standards
IFI	International Financial Institution
IFRS	International Financial Reporting Standards
LG	Local government
NRW	Non-revenue water
PPP	Polluter pays principle
RS	Republika Srpska
SOE	State-owned enterprise
UNDP	United Nations Development Programme
US DoS	United States Department of States
WB	World Bank
WUC	Water utility company
WWTP	Wastewater treatment plant

INTRODUCTION



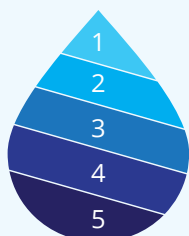
0. Introduction

In 2013 a team of experts assembled by United Nations Development Programme (UNDP) in Bosnia and Herzegovina, lead by dr Branko Vučijak, developed a Tariff Setting Methodology (hereinafter: Tariff Methodology) – a method for evaluation of tariffs for water and waste water service provision in Bosnia and Herzegovina.

In the absence of unique regulatory framework and tariff setting procedures, the proposed method seeks to provide a model for service pricing that would enable full recovery of the cost so that the service is not subsidized through other services provided by the particular company, as it is now often the case. The objective of the Tariff Methodology is to provide single referent framework and an easy to use tool based on which local Water Utility Companies (WUC) can evaluate their present tariffing systems and deficiencies in establishing tariffs for the services they provide. Long term goal is to enable investments in maintenance and development so that it contributes to sustainable management of water systems and resources.

In 2016 and 2017 the Tariff Methodology was tested in WUCs in four municipalities in Bosnia and Herzegovina, two in Federation of Bosnia and Herzegovina (FBiH) and two in Republika Srpska (RS). Respective companies are referenced further in the text as WUC-FBiH1, WUC-RS1, WUC-FBiH2 and WUC-RS2.

Two experts were tasked to evaluate current operations of WUCs against the framework established by the Tariff Methodology. The experts looked at the following elements:



1. Corporate structure,
2. Methods of accounting costs,
3. Methods of pricing services,
4. Development capacities, and
5. Investment capacities.

The practical goal was to evaluate 'real tariff' – the tariff defined after applying principles of the Methodology – against the current tariff. The exercises were executed for water supply and wastewater management services (where they exist).

This report presents findings from the testing exercises. It also brings views and opinions of local stakeholders regarding the Methodology itself and the results of the exercise. In conclusion, it points to important impediments in possible application and presents several recommendations based on which WUCs can improve their tariff setting systems and make their overall operations more sustainable in the long run.

First section describes a set of challenges against which the Methodology was developed, discusses normative set-up and current policies. Section two goes into details of the exercise. It discusses principles of the Tariff Methodology, shortly describes observed WUCs and the process of testing. Third section presents main findings of the exercise and discusses cases separately by drawing attention to identified strengths and weaknesses. Fourth section presents opinions of different stakeholders on political and technical feasibility of the potential implementation of the Methodology. Final section presents general conclusions of the exercise, specific recommendations on improving investment capacities and points to some broader concerns that have to be taken into account.

WATER UTILITY SERVICE PROVISION IN BOSNIA AND HERZEGOVINA



1. Water utility service provision in Bosnia and Herzegovina

Utility services in Bosnia and Herzegovina (BiH) are **highly decentralised** in both norm and in practice. This affects effective governance of key resources including drinking water and causes many problems in providing drinking water, connection to sewers and wastewater collection and treatment.

In both BiH entities crucial laws mandate municipal governments to provide communal water services. The only exception is Canton Sarajevo in Federation of Bosnia and Herzegovina (FBiH) where majority of the population is covered by services provided by Cantonal public company.

When it comes to governing water resources, different legal norms establish very similar general principles. **Water is to be treated as non-commercial good** and as a 'heritage that is to be protected and preserved.' water is to be managed responsibly and rationally in a holistic manner and under equality and equity in access. Final use is set to be defined in such a way to ensure that costs related with the service provision are appropriately recovered. This is implicit in the FBiH norm and explicit as a principle 'user pays' in Republika Srpska (RS). Any damage to the water resources in the form of pollution is supposed to be covered by the subject responsible for the pollution under the '*polluter pays*' principle.

While norms set reasonably good standards, in practice, water supply and wastewater systems have many neuralgic spots. These include: **weak corporate governance, loose regulation, ineffective monitoring over public utility companies' operational and financial performance**, etc.

Another core problem for water service provision stems from a more general problem related to **operations of State owned enterprises** (SOE). According to some sources majority of SOEs are controlled by "various alliances of political parties, increasing the possibilities for corruption and inefficient company management" and many companies are "bankrupted or on the verge of insolvency, representing a growing liability to the government."¹ As UNDP assessment of the water supply sector² from 2011 suggests as well as more

recent assessment of the sector done by the World Bank, WUCs, as a rule, work under **strong political constraints**. They are in effective control of Local governments (LGs) and operations are often set up in a way that works against the sustainability of the company itself. Since they are governed primarily by political interests, whose major goal is to keep the people supportive of those who rule, political rationality trumps calculation.

General Managers are agreed among ruling political parties, while skills, knowledge and experience of candidates come only second, even third. The tariffs for water supply and waste water related services are set by LGs. Adjustments of the tariff that companies are occasionally requesting are usually rejected due to political calculations.

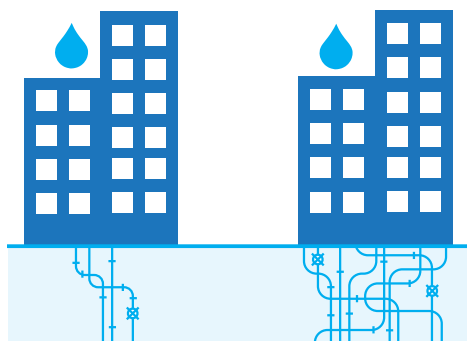
Organizational and administrative functions of majority of WUCs are **underdeveloped**. They suffer from **poor organizational structures** within and across departments, distribution of obligations and responsibilities among departments and employees is unclear, reporting systems underdeveloped. Besides, in many cases there is serious lack of appropriate office facilities and supplies.

Further problems stem from insufficient accounting data collection and processing. While International Standards on Financial Reporting (IFRS) are adopted and applied in entire country, these are applied primarily for external (financial) reporting. The financial reports have been not assessed by UNDP. However, significant deficiencies concerning internal reporting have been detected. These primarily relate to the cost separation practice.

Revenues and expenditures from water supply and waste water services are not recorded separately, but together with other utility services depending on the range of services the WUC provides. Current water tariffs are thus structured artificially, not respecting full cost recovery principle. Some providers have alternatives to basic tariff model based on volumetric measurement and if water meter replacement program was implemented, the tariffs would have two components: flat rate part per customer or water meter; and consumption rate per the amount of consumed water.

Finally, **customers are differently billed, depending on whether they are natural or legal persons**. The majority of companies bill their customers based on volumes, where one tariff is applied to each consumed m³. None of the water utility providers implements decreasing tariffs for certain customer structures. As it is the case with many SOEs, a lot of **WUCs are over-staffed**. Number of staff ranges from 2.3 to 26 employed per one thousand connections.³

Average in upper middle-income countries is a little over 3 per 1000 connections. In low income countries the average is around 11 persons per 1000 connections. Variations are in part due to the fact that many buildings in for example Easter Europe and Central Asia are fitted to single connection.⁴



Municipalities are principal investors in new services infrastructure assets. The majority of assets are neither registered as property of companies nor as property of local governments. Investment is financed primarily from debt and since performance is valued also through politically lenses there are perverse incentives to avoid donations in fixed assets so as to register higher profits.

Consequently, depreciation disclosed in WOCs financial statements fails to capture real costs. Thus, the current tariff policy for water supply and sewerage omits to integrate maintenance of the system as well as funds for capital expenditures (CAPEX) for acquisitions, maintenance, repair and investments.⁵

Further crucial problems relate to the **network losses** (non-revenue water – NRW), tariff rates, ratio of collection of receivables as well as staff expertise.⁶ All of this endangers financial sustainability of water utility companies by reducing their capacities to rationally manage finances.

Against such state of affairs, recent reputable recommendations from the World Bank⁷ call for securing upfront sustainability of investments and a commitment to this goal from authorities at all levels in government. The argument is that only such commitment and continual and well placed investments can secure long term operational viability of companies in this sector.

**METHODOLOGY
PUT TO TEST**

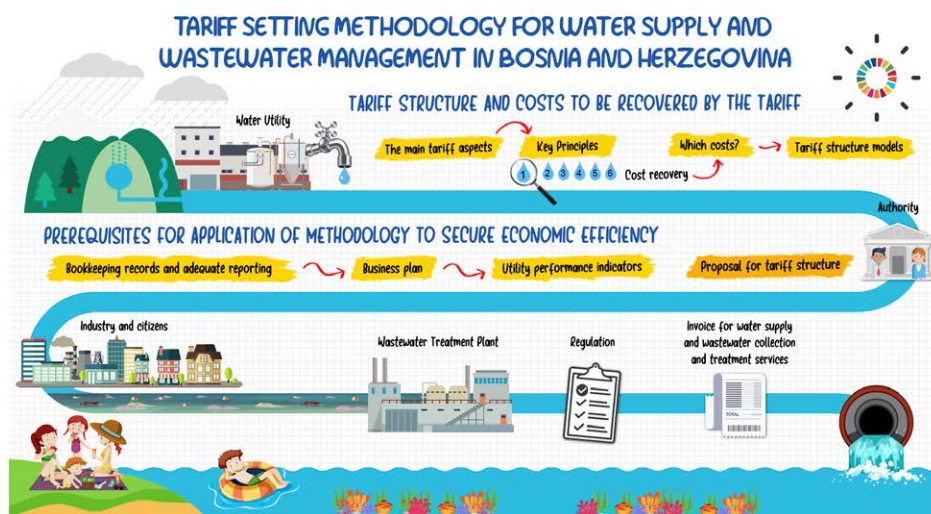


2. Methodology put to test

Tariff Methodology (illustrated in the picture below) was developed and proposed as a method by which several dimensions of the problem sketched above can be tackled at once. With clear and principle-based approach to pricing and accounting organization, the effects of political strife can be minimized, companies turned sustainable and long-term sustainability of resources secured.

Tariff Methodology sets the rules that consider:

- recovery of all costs, including operational and investment maintenance costs, and
- capital investments costs and their inclusion into the final tariff.



2.1. Tariff Methodology principles

The Methodology is based on several core principles, mostly common to tariff structures for public services.⁸

- **Principle consumer pays.** This principle asserts that the cost incurred by a service delivery to a consumer or a group of consumers should be borne by this consumer or a group of consumers. This also means that all costs associated with the delivery of the service should be reflected in the tariff.

In BiH, the principle is not consistently observed although it is stipulated in basic laws. Local providers commonly charge higher water tariff rate for legal than for natural persons. This approach, in fact, cross-subsidises one category of consumers (natural persons) on the account of another category (legal entities). Strict observation of the principle would mean that there is no such artificial classification of consumers (which incur the same costs) and that the only criteria is the total consumption and the related cost of delivery.

- **Principle of equity and equality.** This principle is confirmed by United Nations who in the *Resolution on the human right to water* 64/292 recognized everyone's right to sufficient, safe, acceptable and physically accessible and affordable water for personal or domestic uses. The principle implies a responsibility of the local community to assure water under equal conditions for its entire population.

This is currently not the case in many parts of BiH. Equality of access is assured only in central urban area through the so called central water supply system. Suburban and rural areas are usually not part of the general system for service provision. This principle also affects the application of the consumer pays principle since prioritises universal provision over tariff coverage.

- **Principle of affordability.** Affordability is directly related to principle of equity and equality in access. Indeed, only when considered together, goals set in the said UN *Resolution* may be achieved. In practical terms it represents the highest possible tariff that an average family can pay from its monthly income and for the average consumption per person.

In BiH the ceiling for the water and sewerage bill is (as of recently) established at 4% of the total monthly income of the referent household. Ceiling is established so that the total expenditure for these services allows for other key life support costs to be paid from the income including food, education, medical insurance and similar. Globally accepted affordability threshold is usually set at 3-5% of one's household income.

The application of this criteria is problematic due to the fact that there are no reliable information on the overall income which includes wages but also income from agriculture, tourism, small services etc.

- **Principle of conservation of natural resources.** This principle, also known as the Principle of environmental efficiency, stipulates responsible and sustainable approach to resource use and exploitation. In practice the principle is usually takes the form of water charges (on use of ground and surface waters, water conservation, abstraction from watercourses, etc.), but can be applied through additional charges aimed at decrease consumption and thus the water intake from the environment. It can also be put into practice through charges aimed at neutralising adverse environmental effects that may occur during any phase of resource use.

It is already in use in practice locally through special charges on use, protection and extraction.

- **Full cost recovery.** The principle stipulates that all costs associated with the service should be recovered through service delivery. Its intention is to secure long-term sustainability of the provider by balancing revenues and expenditures. Crucial input for its consistent application is full understanding of all service related costs.

In local practice the principle is observed only partially most notably because of poor record of fixed assets. This is why accounting includes only one part of real depreciation costs and why maintenance and capital investments are neglected. All this this seriously limits service improvements.

This principle should be considered jointly with the affordability and equity principles, what stipulates provision of services to all which are still affordable and related costs are within the defined affordability boundaries.

- **Principle of economic efficiency.** This principle includes optimisation of the use of pumps in the network, chemicals for disinfection, optimal fixed assets management and minimizing the network losses, staff for implementation of all operational activities, and other optimising activities. It relates both to the overall sector performance but also to the particular providers.

It is important for local sector, but also critical for achieving the strategic objectives of the Tariff Methodology

2.2. Goals and guiding questions derived from set principles

These principles were used as a broad framework for evaluating testing outcomes.

Some preliminary remarks are in order. Majority of WUCs provide services in areas other than water and wastewater management. Some are (co-) financed through invoicing to end-customers (legal or natural persons) other charged against local budgets. This affects both **full cost recovery principle and consumer pays principle** since costs for the water service provision are hidden through other services and end consumers do not necessarily cover the actual real expenses. There is an inherited practice that business and public sector bear substantial burden of financing WUC through the policy of diversified tariffs.

All this prevents effective convergence to equal treatment of end consumers and proper observance of **equity and equality and affordability principles**.

Economic efficiency is not considered of highest priority, because of previously mentioned political considerations and underdeveloped corporate governance culture, For this reason, WUCs usually have over-proportionate share of employees with fixed-term contracts and this prevents any serious cost cuts through labour force rationalization.

Environmental efficiency principle was used as a pre-set indicator to analyse how environmental consideration may affect financial performance of WUC and respectively expected tariffs for drinking water supply, sewerage and waste water treatment.

With these principles as guides, the main goals of the exercise were to evaluate the effect that the methodology would have on the:

- Model that includes Waste Water Treatment Plant (WWTP) where existing;
- Structure of employed labour force;
- Affordability of services provided – especially to poor and vulnerable households;
- Companies accounting system.

The testing exercise was concerned with the impact of the possible application of Tariff Methodology on WUCs sustainability and on local community. Several general questions were explored:

- Does Tariff setting methodology (when translated into rules and procedures) responds to current needs of WUCs in terms of operational and financial performance?
- Can its application improve corporate governance on local level (tariff-setting, infrastructure maintenance, affordability and accessibility of water supply and sewerage services to wider population)?
- Can it contribute to the environmental protection in particularly relating to the disposal of wastewaters and treatment of mud?

Evaluation also compared the Tariff Methodology against best already available practice taking into account that observed WUCs do not have same capacities, knowledge and awareness over tariff-setting process.

2.3. Description of testing exercise

In 2016 and 2017, UNDP project team established an agreement with four municipalities, two in FBiH, and two in RS with a goal to test how local WUCs would come out when evaluated against the previously developed Tariff Methodology.

Two experts were hired to perform the exercise. It involved review of the relevant documents including the Tariff methodology itself, laws and strategic documents and other relevant reports. The document review was used to

establish basic context. On this ground, experts undertook a detailed review of technical capacities and financial reports of four participating WUCs. Then they did a core part of the exercise – that is, they applied the Tariff methodology¹⁰ to the data on the current state of operation of selected WUCs. The application involved a sequence of steps:

- Accounting separation by cost centres separately for the months one to three and for the months four to six;
- Evaluation of presently needed tariff;
- Integration of findings from technical expert concerning labour force and NRW measures and the evaluation of their impact on financial performance;
- Evaluation of future optimized tariff, comparison of transition period and transition tariffs.

Once this central evaluation was completed, 13 representatives from all LGs, entity ministries and regulators as well as representatives of expert and professional organizations working in the water supply sector were interviewed.

The goal of this qualitative exercise was to provisionally establish the level of support for measures proposed by the Tariff Methodology, examine views on particular policy options as well as obstacles that may exist for practical use of the methodology in respective local communities and WUCs.

2.4. Short description of pilot cases

All four observed WUCs are registered as public communal enterprises under 100% local government ownership. All WUCs provide water supply service, three are also engaged in wastewater management service provision, while two WUCs also deal with wastewater treatment services. WUCs are also engaged in other services provision which have nothing to do with water distribution and treatment. Some are engaged also in landscaping, maintenance of public spaces and cemeteries, natural reserve management, winter service provision as well as in maintenance of public lighting system in local community (Table 1).

Table 1. Overview of services provided by observed companies

Pilot/services	WUC-FBIH1	WUC-FBIH2	WUC-RS1	WUC-RS2
Water supply	X	X	X	X
Sewerage	X	X		X
Solid waste management	X			
Winter service	X			
Landscaping	X			
Public parks and cemetery maintenance		X		
Public lightning		X		
Natural reserve management		X		
Wastewater service			X	X

WUC-FBIH1 operates in five segments: water supply, sewerage, solid waste management, winter service and landscaping. While water supply, sewerage and solid waste are invoiced to households and legal entities, winter service and landscaping invoicing is based on the contract with local government.

WUC-FBIH2 is assigned to operate in: water supply, sewerage, public parks and cemetery maintenance, public lightning and natural reserve management. The revenue is therefore collected through three separate sources of income: from citizens and legal entities for communal services, from the City for public lightning and maintenance of parks and from commercial services related to tourism in natural reserves localities.

WUC-RS1 operates in water supply and wastewater service provision. It has recently entered construction business, mainly providing services to the local government on competitive basis. Consequently, management uses existing resources in the company, but also employs on temporary basis seasonal workers to engage in construction operations.

WUC-RS2 is registered as water utility company, providing water supply, sewerage and wastewater treatment. Management has significant experience in international cooperation projects and a great oversight over operational and financial performance of the company.

**WHAT COULD BE
LEARNED FROM THE
TESTING EXERCISE?**



3. What could be learned from the testing exercise?

In this section main findings from the testing exercise are presented, including findings regarding accounting procedures, current tariff and the evaluation of the needed tariff when all Tariff Methodology principles are observed.

3.1. Accounting costs and revenues recording separation

One major prerequisite for meaningful application of the Tariff methodology is detailed insight into the costs structure connected with the service provision. Unless there is a clear overview of all costs involved, the *full cost recovery* principle cannot be properly observed.

Laws in both entities stipulate that legal entities should present their financial performance for one year period with profit or loss and other comprehensive income recorded and presented in single combined statement. The statement presents the total cost from operating activity, disaggregated by the type of cost (costs of material and energy, salaries and salary related costs, direct third-party services, depreciation, and costs for provisions and intangible costs). Total cost for the period is adjusted for the cost differed in inventories. However, actual accounting practice differs significantly among observed WUCs and there are cases where no separation is done, or it is done at the rudimentary level.

In order to fix this problem the Tariff Methodology proposes a hierarchical system of cost centres (illustration 1) and a set of rules for cost separation by centres.⁹ This system was used to perform the separation of costs incurred by observed WUCs. Separation was done at least at the level of the service provision, for two subsequent quarters of the year, in order to account for differences in total water consumption over different periods of the year. Accounting separation was conducted on all incurred costs, including the depreciation costs.

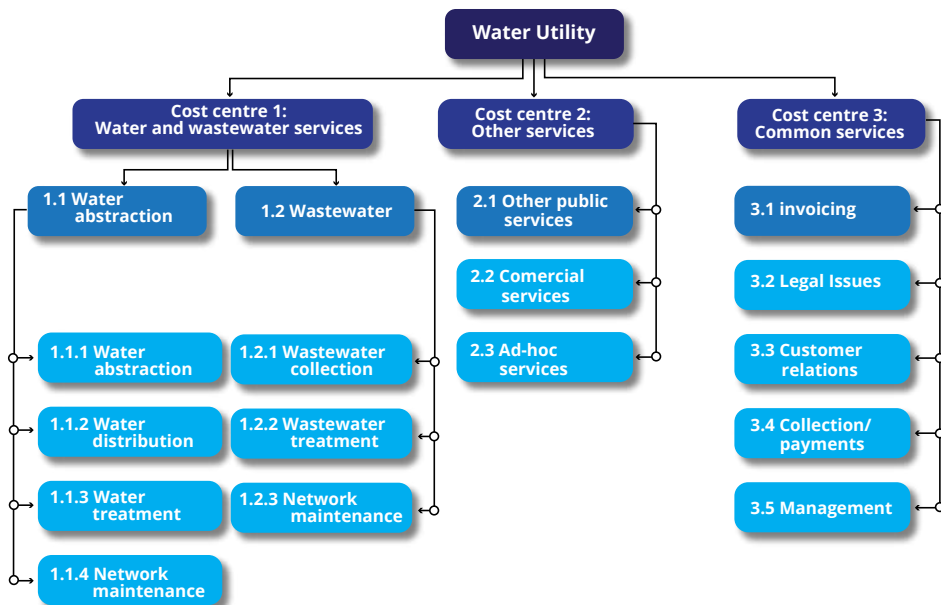


Illustration 1. Structure of cost centres

Wherever possible, costs were recorded at the lowest level within the cost centre hierarchy i.e. the relevant process level appropriate to the type of cost and business value stream. Particular costs which do not specifically connect to the particular process were recorded at a higher level in the cost centre hierarchy. Costs shared by water supply and sewage services which could not be separated by services, were recorded at shared costs centre.

3.1.1. Findings on cost separation relevant across all WUCs

Several findings regarding cost separation practices pertains to all observed WUCs.

- The **cost of material and energy** can generally be allocated to the service provision, based on invoicing (i.e. variable to cost centres 1.1.2, 1.1.3, 1.2.2; fixed to the cost centre 1.1.4). The material and energy consumption in administrative departments may be allocated by introducing a separation key or proportionally to the direct cost.

- The **cost of personnel** involves salaries and salary related costs. They are based on work contracts and internal rulebooks that define the systematization of working places and a factor for payroll accounting based on complexity and responsibility of the particular position. The cost of personnel is a fixed cost, calculated based on time-sheets and actual working hours spent per each of the services provided. WUCs do not disaggregate total hours by cost centres. Legal provisions that regulate employment do not allow for output-based costing. Therefore, personnel cost for those employees is allocated on cost centres, using time spent as basis for allocation.

At present WUCs have very little flexibility in applying any Human resources management related measures.

While bargaining power of work force differs among WUCs, depending on the existence of collective agreements, vast majority of employees have permanent contracts which is why, as stipulated by Labour laws, lay-off measures are significantly limited. Further, current systematizations foresee greater number of employees than currently employed. Because of this, management and supervisory boards, may opt to increase total number of workers for political objectives.

- Another important part of cost calculation relates to the way **depreciation and amortization are recorded and accounted**. They are recorded on the annual basis, based on the respective accounting policy, obeying maximum non-taxable rates. The cost of depreciation is fixed and can be easily accounted to relevant cost centre. There are however many deficiencies in how WUCs record and calculate depreciation and amortization costs. At the moment depreciation embraces those assets recorded as property and equipment. At the same time none of WUCs reports investment property as it is prescribed by IAS (International Accounting Standard). For this reason WUCs fail to perform revaluation of assets. Instead, the depreciation is calculated based on 'at cost' values.

The evidence of assets are not reliable. The underground infrastructure is only partially recorded in general ledgers. The depreciation rates do not follow valuation on cost approach. The crucial deficiency in the accounting systems of all four WUCs pertains to the insufficient use of one particular accounting standard (IAS 37 – Provisions, Contingent

Liabilities and Contingent Assets). For this reason, none of them can ensure sufficient CAPEX funds that would enable regular maintenance and replacement of deteriorating assets or investments.

3.1.2. Individual observations on cost separation

At the study development WUC-FBiH1 shows significant capacity to apply tariff-setting methodology in the near future. It applies separate coding system for manual separation of costs on cost centres and plans to integrate automatic processing in the near future. Major impediment for fully reliable accounting separation was in the ill-defined procedure for assigning current employees and equipment among sectors, because of which it was yet impossible to track time spent in each sector per employee. Also, separation of duties and utilization of resources for each separate service is not yet fully in place. Feasible option for WUC may be in stricter regulation of departments and resources dedicated to each department in order to avoid subventions among services.

WUC-FBiH2 did not yet apply any accounting separation procedure and records were not sufficiently reliable to allow for persistent application of tariff-setting methodology. The company works in water supply and sewage, but also in public parks and cemetery maintenance, public lightning and natural reserve management. For these reasons large portions of its operations in water supply and wastewater services are heavily cross-subsidized by income from other services, what makes the full costs separation harder to achieve. Only 1/3 of households in water supply system is connected to sewerage which is a very small base for charging service against households, what threatens affordability for that particular service, if the related costs are fully separated. Another serious problem is in illegal connections and consequently increased non-revenue water as administrative losses, making wrong basis for the actual costs' separation and consequent tariff evaluation, and management has already introduced inspections to detect and prevent those in the future.

Current set-up of WUC-RS1 would allow relatively smooth adoption of cost separation and reliable tariff-setting procedure. At the moment of observation, the Company did not have effective system for accounting separation on cost centres in place (it was introduced later). However, organizational design of the company, solid competences of the management as well as recent changes in operations and tariff makes it reasonably ready for Tariff methodology adoption. Company has recently entered

construction business, mainly providing services to the local government on competitive basis. Consequently, management uses existing resources in the company, but also employs on number of seasonal workers to engage in the construction operations.

WUC-RS2 already has a very developed system so Tariff methodology can be applied within existing capacities and within short period of time.

The company is registered as water utility company, providing water supply, sewerage and wastewater treatment. It management is highly experienced and has a great oversight over operational and financial performance of the company. WUC has developed sophisticated model for cost accounting that includes the costs separation and uses it for internal reporting and decision making purposes. Management also uses internal reports and analysis to negotiate tariffs with policy makers.

3.2. Present tariffs evaluation

Based on the accounting separation of costs in two subsequent quarterly periods in 2016 and 2017 respectively, current tariffs were evaluated against the ability of the company to provide water services in financially viable way, with no profits. **The analysis shows that current tariffs enable fully viable operation only in WUC-RS1.** Current tariff ensures profitable operations for connections in the urban area. The mean tariff (legal persons and households based on current consumption) for water supply is 3.6% margin, while sewerage margin is 11.3%. However, management considers extending the network to sub-urban area, mainly settled on hills and sparsely inhabited. This may significantly increase the cost, especially in total energy consumption, while the new consumers will not proportionally follow this increase. Consequently, it is expected that needed tariff in the future will increase.

In three other companies tariffs are set below economic tariffs – so with disregard of economic efficiency principle. Indeed, in these cases LGs subsidy WUCs operational costs by:

- a. Financing from so called collective communal services (maintenance of public spaces, winter service etc.);
- b. Providing concessionary rights over particular location and/or sector; or
- c. Providing company-level direct subventions.

In the case of **WUC-FBiH1** the present tariff allows for subsidies in solid waste management tariff against water supply tariff. Present water supply tariff lays 11% below cost recovery threshold, opposite to sewerage tariff that ensures 40% positive margin.

In **WUC-RS2** water supply is subsidized from the sewerage tariff. Present tariff calculated in testing exercise for three core services: water supply, sewerage and wastewater treatment differs in ranges 10 – 15% to those calculations produced by WUC.

WUC-FBiH2 heavily subsidises tariffs for sewerage through commercial income generated from tourism related income. In WUC-FBiH1 sewerage tariff subsidises tariff of the water supply, which is to some extent the case in WUC-RS1 as well.

Current set-up exposes observed WUCs to different risks. Regulatory framework on concessions and public procurement allows for outsourcing to third parties. For this reason, LGs have the discretionary power to grant contract to any other legal person in the future. Expenditure side of WUCs financial operations is, on the other hand, very rigidly bound to legal provisions, especially in term of employment contracts. This leaves little flexibility to optimize labour force against any changes in total expenditures. Consequently, withdrawal of subsidy over current cost of water supply and sewerage through contracting another parties would cause serious financial distress for the respective company.

WUC-FBiH2 is particularly exposed. Different sources of revenue are volatile, while majority of cost is fixed and cannot be easily substantially managed. If the profiting service provision (natural reserve management) is granted to any other legal entity the company may face serious financial distress in mid-term period.

3.3. Technical findings

Technical evaluation, aimed at enabling the conditions for costs optimization, resulted in three main recommendations to WUCs (full summary is in the Illustration 2 - below). In order to be able to properly implement the requirements of the Tariff Methodology each WUC should:

- a. Perform revaluation of assets and depreciation cost to enable funds for replacements,
- b. Introduce measures in human resources management and the size of work force,
- c. Introduce mid-term NRW measures aimed at reducing NRW level

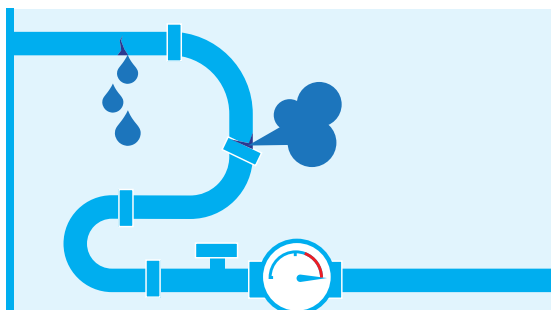
If depreciation would be performed on revalued assets, technical expertise suggests, NRW measures can be financed in sustainable way. The increase in depreciation would range between 210 and 697 thousand BAM, while annual investment into NRW measures from 100 to 217 thousand BAM.



Still, these measures would differently affect different companies. Depreciation of assets of WUC would considerably negatively impact the business operations in WUC-FBIH2. On the other hand, it may be considered as a measure by which future investments into needed network maintenance (longest network per connectivity) could be financed.

If moratorium to new employment is introduced, with the natural outflow of current workforce (pension), two WUC may in mid-term reach the target of 1.2 employees per 1,000 customers.

Estimate of the reduction in energy consumption due to reduced leakages and needs in pumping water ranges between 7 and 69 thousand BAM, except in the case of WUC-RS1, where it is estimated that the total cost of energy consumption may increase by 54 thousand BAM.



Expert assessment further points that investment into NRW measures may be considered beneficial solely from the environmental point of view. In financial terms they would likely put additional pressure on operations of all four WUCs. Estimated return on investment into NRW measures, calculated through savings in energy consumption ranges between 3.9 and 69% on 1 to 25 years payback period.

WUC	WUC _{FBiH1}	WUC _{FBiH2}	WUC _{RS1}	WUC _{RS2}
Depreciation (current)	330	73	124	453
Depreciation (needed)	547	770	334	703
Net change	217	697	210	250
Annual cost od NRW measure	(178)	(217)	(187)	(100)
Energy consumption (current)	226	288	115	413
Energy consumption (expected)	219	264	169	344
Annual saving (increase)	7	24	(54)	69
ROI	3.9%	11.1%	(28.9%)	69.0%
<i>In years</i>	25	9	-	1

**Illustration 2. Technical expertise outcomes – summarized
(in BAM thousands)**

3.4. Determining needed tariffs

After applying three core measures suggested by the technical expert to current tariffs – as an operational and financial framework that would secure mid to long-term sustainability – the projections of the future needed tariff for forecasting period from 7 to 10 years were calculated. In summary, new tariffs would have to be:

- Slightly increased for water and decreased for sewerage in WUC-FBiH1;
- Substantially increased for water and 9-times increased for sewerage in WUC-FBiH2;
- Slightly increased for water in WUC-RS1; and
- Moderately increased for water and significantly for sewerage (incl. treatment) in WUC-RS2

WUC	FBiH 1		FBiH 2		RS 1		RS 2	
	Water	Sewerage	Water	Sewerage	Water	Sewerage	Water	Sewerage
Expenditure per m ³	1,4193	0,4204	2,3200	2,0400	1,0729	0,2801	1,2839	0,6740
Current price per m ³	1,2587	0,5899	1,2600	0,2564	1,1115	0,3118	0,9321	0,4597
Margin	(11.3%)	40.3%	(45.7%)	(87.4%)	3.6%	11.3%	(27.4%)	(31.7%)
Future tariff	1,5608	0,4542	2,9270	2,1317	1,3293	0,3118	1,1950	0,7079
% increase/decrease	24%	-23%	132%	731%	19,60%	0%	28,20%	54,20%

Illustration 3. Current and needed tariffs (in BAM)

When estimated against the affordability principle projected future tariffs are within affordability range evaluated based on the income per household in each location. The only exception is WUC-FBIH2 where significant increase in tariffs that is deemed necessary by the testing exercise would also place the service outside of this range.

Nevertheless, even if the tariff remains within the affordability threshold, there will always be households in need to be supported to pay for such a water bill. Subsidy system is not the part of the tariff methodology and thus was not considered in detail. Two LGs are indeed developing such subsidy system for the population in need. It should be also stressed that such subsidies provided are not the responsibility of the WUC, but of the LG.

WHAT DO STAKEHOLDERS THINK OF THE METHODOLOGY?



4. What do stakeholders think of the Methodology?

This section reviews different opinions and views collected through interviews with stakeholders.



Crucial for any viable application of the Tariff methodology in the current institutional and normative set-up, in the absence of unique regulatory framework which would make its application (or application of any other method) obligatory, is the level of support it may receive from local political authorities.

To evaluate whether such support may be expected, local government representatives were interviewed (except for the LG representative from one FBiH municipality). Still, views of three informants provide insights into the set of reactions one might expect in some further phases of the implementation of the Methodology.

4.1. Local government views

Any practical implementation of the Methodology depends on the support of local governments. It is likely that in many cases application of the Methodology would lead to relative increases in the tariff level, but in fewer cases also to decreases in the tariff level. This only testifies to the effects of the current approach to tariff setting across municipalities.

Findings on 'needed tariff' show that Methodology is not about simply raising tariffs. Instead, its goal is to find optimal tariff levels which would enable not only maintenance of present operational capacity but also long-term sustainability of the company, and even more importantly, of the service itself.

Although things seem straightforward not all LG representatives express support for all of its implications. Below we discuss some of the points raised by LG representatives.

Representatives of local governments were asked if they would support introduction of **Tariff Methodology principles** in their Local community.

- While representatives from LG RS1 and LG-FBIH1 expressed readiness to fully observe principle of full cost recovery and particular requirements including accounting separation of all costs, defining measures for improvement in effectiveness, determining tariffs that will ensure full cost recovery for water supply and sewerage, measures on labour force optimization and on targeted investment in NRW, the LG-RS2 representative did not show support for measures needed to properly observe and practically implement said principle.
- Similarly, LG representatives from RS1 and FBIH1 clearly understood that needed tariffs may influence affordability of WUC services, only the RS2 LG representative again disagreed.

Another crucial element of involvement of LGs relates to **interventions aimed at improving current infrastructure maintenance process**. LG representatives were asked to provide their assessment:

- There is a general agreement among LG representatives on the need to establish effective system through which maintenance of water supply and sewerage infrastructure would be financed.
- All LG representatives hold that WUCs need to disclose their revenue clearly disaggregated by occurrence in order to enable clear overview of their income generation capacities.
- They all agree that there is an urgent need to manage supply of service in sustainable way. To this end, as three LG representatives claim, improvements on asset registration are either already initiated or in the process of being made.
- They also agreed that allocation of some part of the tariff should also include inputs for maintenance funds.

- To preserve affordability to all end user, LGs would not be reluctant to consider subventions to vulnerable population in more systemic way. True, as underlined by one LG representative “this population is not directly under any sort of LG’s jurisdiction” so any measure in this direction “needs merely recognition and approval of the current politics, as it impacts municipal budget”.

LG representatives were also asked to evaluate the current **capacities concerning mid-term planning** and to give their opinions on the ways in which tariff-setting procedure should be improved or amended. All respondents:

- Recognize that mid-term planning is insufficiently developed and in need of improvements.
- Agree that planning should be better steered and monitored at all levels of governance and should involve both mayors and assemblies but also supervisory boards.
- Report readiness of the LG to improve strategic planning procedures.

When it comes to **tariff setting process**,

- Respondents mostly agree that the process should be taken into account when the network is being extended or if the new source is connected to the network.
- LG representatives recognize that both wastewater treatment and mud treatment must be considered when determining tariff-setting procedures for the wastewater treatment specifically.
- They also recognize the need to consider various dynamic parameters such as depopulation through migration in establishing tariff-setting procedures, however they do not attribute particular weight to this consideration.

4.2. Views of policy makers and experts

Public services should serve general public interest. In practice, instead, articulated interests mostly reflect current political environment and alignments. This is why, as already noted, SOEs are often used as instruments to achieve particular political goals.

The same can be roughly said to apply to majority of WUCs. As highlighted by **an independent expert** “WUCs interest is directly linked to and influenced by political interest in their municipality/city.” With this in mind, key informants were asked to evaluate WUCs interest and capacities to apply the Tariff Methodology. They were also requested to provide their assessment of anticipated municipal/city councils support or opposition to the introduction of the Tariff Methodology.

All expert informants as well as policy makers maintain that WUCs have clear interest in applying the Tariff Methodology. The Methodology, in their view, provides a solid framework for WUCs to make their business operations more viable. They hold that it should be integrated into relevant regulatory frameworks as a mandatory procedure that is to be followed by all public water utility companies, local governments and oversight institutions.

When it comes to capacities for its practical implementation different WUCs are judged differently. According to the informant from **FBIH Ministry of Agriculture, Water Management and Forestry**, “some WUCs do not have human capacity and awareness of the effects that can be achieved in the cases where Methodology would be applied.” The testing exercised also clearly showed that there are significant differences in capacities.

Some WUCs have much stronger capacities for implementing any new technical or operational solutions. This is mostly due to their experience with water management programs and preparatory work for arrangements with International financial institution (IFI) in previous years.

Regarding instruments necessary to enable improved corporate governance the informants were asked to assess several options. They almost fully agree **that improvement in this domain should involve stricter division of responsibilities among stakeholders as well as individualized responsibilities** for tariff setting. They also almost unanimously support creation of independent bodies such as ad-hoc expert commissions for validating tariff proposals as well as a regulatory body with strong oversight role. They also contend that specialized guidance for assessing compliance with the Tariff Methodology through should be installed.

Informants were also asked to present their views against pre-determined set of policy options. One expert suggests that “regulatory problem concerning Federation BiH relates to shared responsibilities between local and cantonal jurisdiction”. As further noted, “when determining tariff-setting Methodology regulation, considerable authority relates to management and/or preservation of water resources and these question relate to the integrated water management”. Since this is shared responsibility of the FBiH and cantons, it “should be regulated on entity level and further explored on cantonal level.”

Majority of respondents believe that currently anticipated approach, which envisions a by-law at the entity level, would be the most appropriate and most feasible way to integrate Methodology into regulatory framework in FBiH. Some respondents also support other options that may be equally effective, but less politically feasible: through amendments to the Law on local self-governance. To do this, one expert suggests, one should give responsibility for tariff-setting to mayors, align cantonal laws with FBiH by-law and then prescribe inspection and penalties in the cases where tariff is not adopted.

In general, informants agree that it is not particularly important if the Methodology is introduced through laws, as by-laws or via special decisions. **The important thing is to have clearly established responsibility of majors for its implementation** as well as appropriate penalties for mayors who fail to observe tariff-setting procedure. If established in such manner, one expert respondent contends, “Municipal councils should not have power to vote for tariffs as long as mayors act in accordance with the Methodology” and as long he or she can clearly show “that core principles are respected.” Against such view, one respondent claims that “The Methodology will not be enforced as long as there is no operating Regulatory body on the level of FBiH.” So, the view is, “the only option is thereby in adopting FBiH Framework law for communal services and establishing Regulatory body”.

The administrative set-up and the separation of powers in RS allow for somewhat easier process of regulating mandatory use of the Methodology. Respondents agree that the regulation needs to be on entity level but express different opinions of competing policy options. Thus one respondent claims that the simplest way would be to introduce it through a special Decision, “as it is much more feasible option then adopting it through the law, although”, as he further underlines, “law would offer sustainable solution in long run.”

When asked to assess Tariff methodology in general and its policy relevance within local context, all informants shared a view that the Methodology

would be significant improvement in the current regulatory framework. Representative from the *Association of Waterworks of Republika Srpska* expressed support to the application of Methodology. However, as she rightly notices, in the current regulatory conditions, any general application would “depend on each separate enterprise and local community”.

At the moment, the only thing they can do is to “recommend its application until the day it becomes legal requirement.” Informant from the Ministry underlined that before any serious application of the Methodology “much needs to be done as preparatory work”. In order to be implementable, he notices, the Methodology “needs to be further explained and developed.”

CONCLUSIONS AND RECOMMENDATIONS



5. Conclusions and recommendations

Organized water supply and wastewater management services provision is one of the most fundamental elements of any decent system of public service provision. It is however dependent on different factors. Both political choices and social demands influence how water is distributed, but these choices and demands might not take into account that there exists a generational duty to maintain the resource and the infrastructure for coming generations.

We revisit in this study some of these factors, which influence and are influenced by the process of tariff setting. We present a tariff methodology and apply it in four pilot WUC's to discuss feasibility for effective replication in other water utilities. Based on findings from the application of the proposed methodology, we point at some limitations and concerns that constraint effective management and operation of water services by WUCs, and then discuss possible measures which may address these limitations and enable more sustainable delivery of water. This concluding section is therefore organized in three separate sections.

5.1. The methodology of tariff setting: strengths and weaknesses

To start with, it is stressed that the tariff methodology itself could actually be applied autonomously by the water utility companies and proposed to LGs for adoption. In some cases, however, besides the WUC and LG commitment and political will for its application, which is the primary precondition, it would be necessary to have or to build capacities to implement formerly mentioned activities like the accounting costs separation, revaluation of assets and depreciation cost, introduce measures in human resources management and staff number optimization, or implement enhanced NRW measures. This would likely require specific and tailored training for WUC's staff in order to achieve long-term and sustainable improved utility management and tariff evaluation based on efficient costs management.

One key **strength** of the methodology application relates to an improvement

of the overall management of the utilities. Its principles as well as steps of practical application are highly useful for identifying deficiencies and can serve as a solid ground for mounting efforts into their elimination or at least mitigation. Methodology's insistence on strict costs separation by defined cost centres enables the evaluation of the service tariff based only on directly related costs which is now not the case in almost all local WUCs. It further helps demonstrate the need for optimized staff capacities both in terms of number of employees and in terms of staff competencies. In this way, long standing practice of uncontrolled employment for the political reasons would be stopped. The methodology is also useful to show when there is a need for serious improvement in the management of non-revenue water, as well as in the regular investment maintenance. The case studies show that these two are among major issues in almost all WUCs and a reason why many operate with obsolete and leaking networks, and without funds for its repairs and replacements. The methodology also sets the operational standards and introduces the performance based management as well as basis for comprehensive metering programme within the whole network, allowing for strongly improved maintenance. As a rule, these two elements are missing. Finally, once the accounting practices are aligned with the proposed costs recording by cost centres / services provided, the proposed methodology allows for very simple tariff evaluation, even if the collection rate is expected to be lower than 100%.

In terms of weaknesses, it must be underlined that the methodology cannot be applied without accounting software that allows systematic costs separation and financial reporting separated by the costs centres. This might not be a serious limitation since the majority of the water utilities in BiH already do have appropriate software, although for one reason or another they are rarely using it for this purpose. Experience from the Municipal Environmental and Economic Governance Project (MEG) supported and financed by the Government of Switzerland, and implemented by UNDP BiH shows that the utility companies are quickly getting used to such a change in accounting practices.

The key **threat**, and thus also the major challenge to wider application of the methodology, is achieving political support, since it directly conflicts with the two political commonplaces in public communal services provision companies: 1) keeping the tariffs low and not observing the cost recovery principle (politically advertised as "care for the people"), and 2) the political support or even pressure to increased employability with unnecessary employments in public institutions, quite often inclusively practiced for members of leading

political parties. At present, these practices are considered normal but the methodology also aims to change such mindset. This is needed for the majority of public sector and not only for water services provision.

In sum, test application of the methodology in the four municipalities have clearly proved its effectiveness and applicability, provided that there is a committed utility company as well as political will from the local government. If the methodology would become a part of formal legal regulation which would directly enforce its implementation, the risk of political avoidance and the preference to keeping the status quo, with highly influenced employment process and low and populist tariffs, would be minimized. Since the tariff methodology is intended not only to provide the mathematical basis for tariff evaluation, but also to set the basis for the enhanced management of the WUCs and clear recognition and optimization of the costs related to each of the serviced provided individually, the next section outlines main concerns related to the sector.

5.2. Some concerns

Ineffective system of investments into replacement of deteriorating assets and maintenance of the network represents continuous liability and may lead to future losses. Undervalued assets and assets not disclosed in balance sheets or out-to-balance evidence lead to underestimated depreciation and amortization costs and overestimated current profits and retained earnings. Implicitly, shareholders equity is overstated. This leaves no space for early signals in financial reporting that could be used to forecast any financial distress in the future.

Further, relatively low level of investments and debt contracting allows for acceptable net working capital to maintain liquidity and avoid financial problems. Local governments as owners of public utility companies are not legally bound to aggregate accumulated losses and debt of SOEs. Consequently, it could be expected that those local governments with high indebtedness rates and poor income from taxes and non-tax income, may lose capacity to intervene into WUCs to overcome their potential financial distress.

Public WUCs are mandated by local governments to provide water supply and wastewater management services and have a responsibility to maintain the network in the long run. In effect all WUCs need sufficient financial resources to conduct regular maintenance and replacement of deteriorated network

parts but they differ in their capacity to govern the whole process, as well as in their views towards ensuring long-term sustainability of service provision. Strategic approach to the network maintenance is on average poor and is not linked to other measures which are supposed to ensure effective process.

5.3. Measures which can be taken

Properly evaluated depreciation of assets could help WUCs to accumulate financial resources needed for regular maintenance and replacement of water and sewerage networks. Depreciation used in the tariff setting for forecasting reasons should be based on cost approach – the amount that would be required currently to replace the service capacity of an asset (current replacement cost). By reasonable application of specific accounting standards WUCs could build solid baseline for CAPEX capacities in the future.

For a WUC wishing to achieve this it will need to:

- Reevaluate entire network (pipes and equipment) in accordance with the standards. This means estimating the tariff at which an orderly transaction to sell the asset would take place between market participants under current market conditions.
- Introduce and apply such accounting policy that ensures annual provisions for future investments and for replacements spread over estimated life of pipelines and other equipment (for instance 2% per year, for 50 years).
- Introduce and apply such accounting policy that ensures annual provisions for regular maintenance based on historical data on costs incurred in repairs.
- Introduce financial management policy regulating that adequate portion of charged services is regularly transferred on separate bank account (or analytical code). The policy needs to stipulate that funds are designated exclusively for either of the two provisions recorded.
- Produce mid-term investment plan which includes investments into replacements and NRW measures with a set of financial and non-financial indicators. Investment plan is then to be financed through specially designated fund that can be easily traceable by supervisory boards and/or assemblies.

Besides all mentioned, serious deficiency in current tariff-setting systems across all water utility companies also relates to the fact that the polluter pays principle (PPP) is not well transferred into pricing policy. Changes can be achieved only if both local governments and water utility companies mutually agree to integrate PPP into tariff-setting processes.

For a municipality and WUC who would do it, two initial measures are needed:

- Preparing the map of polluters on the territory, and
- Enabling choices for industrial polluters to either integrate their own waste water treatment facilities or be charged for the treatment through WUC tariff.

Neither WUCs nor LGs as owners seriously forecast how dynamic parameters may influence future WUC financial performance. Three main factors in combination may cumulatively affect future operations of any WUC:

- a. Recently pronounced emigration from the country is expected to significantly narrow down the customer base in longer run.
- b. Extension of their networks to more sub-urban areas, creates disproportionate relation between expected revenues and incremental costs. Furthermore, population in sub-urban areas tend to use own septic tanks and are less likely to be included in wastewater treatment service.
- c. Future WTPs and mud treatment will undoubtedly impact needed tariffs and exercise particular pressure on the affordability of tariffs.

Local governments do not seem to be aware of the fact that interventions into environmental protection, accompanied with negative effects of other two factors, seriously affects affordability of water services for socially vulnerable. Consequently, this pressure may impact stability of public finance.

In the broad sense, long term sustainability of the service can be achieved only by rationing the social need and the actual cost of delivering the service. While it needs to be protected as a most basic right, it also has to be available for future and this task cannot be completed without serious investments.

Endnotes

- 1 2018 Investment Climate Statements: Bosnia and Herzegovina, available at: <https://www.state.gov/reports/2018-investment-climate-statements/bosnia-and-herzegovina/>
- 2 Report available at: www.ba.undp.org
- 3 Further reading can be found in Vucijak (2013) report, available at: <http://www.mdpinicijative.ba/images/dokumenti/Analiza-pravnog-i-institucionalnog-okvira-za-rad-vodovoda-u-lokalnim-zajednicama.pdf>
- 4 Vucijak, Branko (2015) Tariff Setting Methodology for Water Supply And Sewerage Services in Bosnia And Herzegovina, UNDP Bosnia and Herzegovina.
- 5 Funds generated by company and utilized for buy, maintenance, or improvement of its fixed assets, such as buildings, vehicles, equipment, or land.
- 6 Views available at: <http://www.watergovernance.org/programmes/goal-wash/bosnia/>
- 7 Further reading: <http://documents.worldbank.org/curated/en/848191530818491433/Bosnia-and-Herzegovina-Water-Quality-Protection-Project>
- 8 The following is based on Vucijak, Branko (2015) Tariff Setting Methodology for Water Supply And Sewerage Services in Bosnia And Herzegovina, UNDP Bosnia and Herzegovina.
- 9 Vucijak, Branko (2015) Tariff Setting Methodology for Water Supply And Sewerage Services in Bosnia And Herzegovina, UNDP Bosnia and Herzegovina.







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