# Key principles of water tariff methodology

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**Abstract**: Regulatory framework for water supply services in different Balkan countries does not provide the necessary level of self-sustainability of these services, and they are searching for the needed improvements. Management of water supply service providers usually point out the tariff rates as critical to their operations, together with the level of non-revenue water, staff number and expertise and eventually collection of receivables. Even more, high non-revenue water is often justified with existing low tariff, claiming that it cannot cover all costs and the first activity that is usually left without financial resources is regular renewal and reconstruction of the network, causing real network losses grow year after year.
Since any needed costs recovery can be assured with sufficient rise of price and adequate collection rate, water supply managers often underline that the EU legislation requests for "cost recovery" as one of the key principles of tariff setting. Even more, wording is often extended to "full cost recovery", thus stressing that it is not only operational costs to be recovered. But at the same time limited observations are made to other key principles that would keep the tariff justified and affordable.
The paper discusses several additional principles to be observed, as well as their visibility within the legal environment of the selected Western Balkan countries.

**Keywords**: water tariff, tariff methodology, key principles, cost recovery, economic efficiency

# Ključna načela metodologije za određivanje cijena vode[1]

**Sažetak**: Regulatorni okvir za usluge vodoopskrbe u različitim zemljama Balkana ne osigurava potrebnu razinu samoodrživosti pružanja ovih usluga, pa te države traže potrebna poboljšanja. Uprave pružatelja usluga vodoopskrbe obično ukazuju na to da je visina cijene ključna za njihovo poslovanje, uz navođenje kao važne i razine neprihodovane vode, broja i stručnosti zaposlenih, eventualno i naplatu potraživanja. Štoviše, i visoke razine neprihodovane vode se često pravdaju postojećom niskom cijenom, za koju se tvrdi da ne može pokriti sve troškove, pa je prva aktivnost koja obično ostaje bez financijskih sredstava redovna obnova i rekonstrukcija mreže, što uzrokuje rast curenja u mreži godinu za godinom.
Budući da se svako potrebno pokrivanje troškova može osigurati dovoljnim porastom cijene i odgovarajućim stupnjem naplate, uprave vodoopskrbnih poduzeća često ističu da zakonodavstvo EU poziva na "pokrivanje troškova" kao jedno od ključnih načela za određivanje vodnih tarifa. Štoviše, formulacija se često proširuje na "pokrivanje svih troškova", naglašavajući tako da nisu samo operativni troškovi oni koje treba pokriti. No istodobno se vrlo ograničeno ukazuje na ostala ključna načela koja bi zadržala cijenu vode opravdanom i prihvatljivom.
U radu se raspravlja o nekoliko dodatnih načela koje treba poštovati, kao i njihovu vidljivost u pravnom okruženju odabranih zemalja zapadnog Balkana.

**Ključne riječi**: cijena vode, tarifna/cjenovna metodologija, ključna načela, pokrivanje troškova, ekonomska učinkovitost

[1] Rad napisan na engleskom jeziku. Prijevod na hrvatski: Goran Šamo

## 1. INTRODUCTION

United Nations General Assembly adopted its Resolution 64/292 on July 28 2010, which clearly recognized right to water and sanitation as one of the basic human rights. It also recognized that access to potable water is a prerequisite for realization of all human rights [1].

Two years later, UN Committee on Economic, Social and Cultural Rights adopted General Comment No. 15 on the right to water, which clarifies that the right to water means right of all people to available, accessible, affordable, acceptable, and safe water (and sanitation), for personal and for domestic uses [2].

Obviously some of these requests are partially conflicting and there is a need for their balance. Availability means that amount of water supplied per person should be sufficient for all his/her personal and domestic use, World Health Organization (WHO) defined that amount as 50 to 100 litres per person per day. Such water supply to be secured implies related costs, where the affordability restricts these costs to selected percentage of the average household income. Tariff setting procedure is the key instrument to secure achieving needed balance.

Water tariff setting procedure in Western Balkan countries ends in municipal/city assemblies or with mayor's agreement, where quite often political representatives have own representation of the affordability, claiming that the local population is poor and cannot afford the proposed tariff, supposed to cover all costs. Such attitude can be recognised in relatively frequent non-approval of tariffs proposed by water utilities. Insisting on lower tariff, if such is finally adopted, they start or contribute to the cycle of underfunding water supply and sanitation services, what consequently leads to avoidance of regular renewal and reconstruction of the network. Such aging network increasingly leaks and high level of non-revenue water hinders regular operations.

Another practical issue is that there is general acceptance of the cost recovery principle, but without clear understanding which costs should be taken into account, and even more which costs should be accepted as justified (and which not). This lack of understanding does not relate to inclusion of environmental and resources costs, as stipulated in the article 9 of the EU Water Framework Directive, but even to the comprehensive understanding of the financial costs of water services [3]. While operation costs are always included, maintenance costs and capital costs are only partially present in the tariff calculations.

Tariff setting procedures are even more complicated with applying different tariff rates for physical persons and legal entities, actually achieving cross-subsidising of household payments by legal entities. Ratio of these tariffs is arbitrarily derived, there is no operational basis for that. Another point is that in smaller municipalities water supply and sanitation services are often combined in the same utility with other communal services provided, where all costs are accounted at the level of the company and not separated by functions, what prevents defining level of costs to be covered by specific water tariff.

All of above mentioned clearly indicated need for defining water tariff methodology that will not present only mathematical response to evaluation of needed tariffs, but will also be instrumental to alleviation of different sector issues, as pointed out. Such need actually exists primarily in transition countries from a planned towards market economy, and Western Balkan countries are trying to find own localized responses. Some of the key principles to be observed with the methodology are presented below, with review of these principles within the tariff setting related documents of Western Balkan countries.

## 2. WATER TARIFF SETTING KEY PRINCIPLES

### 2.1 Costs recovery principle

There is consensus around the world that the cost recovery principle has to be followed in order to secure sustainability of the water services provision. For example, article 9 of EU Water Framework Directive is labelled as "*Recovery of costs for water services*" and it specifically requests that the Member States take account of the costs recovery of water services, including environmental and resource costs. Such recovery of costs should be based on economic analysis conducted and will also consider polluter pays principle [3].

Environmental costs are defined as "*the costs of damage that water uses impose on the environment and ecosystems and those who use the environment*", while the resource costs are defined as "*the costs of foregone opportunities which other uses suffer due to the depletion of the resource beyond its natural rate of recharge or recovery*" [4].

In practical implementation of this principle there are variety of approaches. Even within the EU countries inclusion of environmental and resource costs is disputed. Erik Gawel (2014) presents several arguments why environmental and resource costs should not be included, pointing that these costs cannot be practically calculated, it is hard to asses for which water status environmental cost as value losses should be evaluated, legal obligation to provide calculation method for these costs is not defined, such methods used in practice are often costly and time-consuming and other [5].

In Western Balkan countries even the directly related costs for water services are not commonly and identically understood. In principle they include staff costs, energy costs and other operational costs, as well as renewal and maintenance costs, depreciation, but also financing costs incurred for the long-term investment. Of course all of these costs should relate only to the related service provision, thus they should be recorded separately for water supply and for sanitation services, as well as from waste management, district heating or other services provided by complex utilities convenient for smaller communities.

And already at this point two major issues could be recognized in implementation of the costs recovery principle - one relates to convenient accounting procedures where all the utility costs are recorded at the highest level of the company (and thus individual costs only for water services remain unknown), and the other to inclusion of all components listed above, where often renewal and maintenance costs or financing costs drop out from that list. At the same time depreciation is mostly properly accounted, but quite often to very limited number of records of the fixed assets book, where the legal environment allowed many of the assets like pipelines or pumping stations to be unrecorded. Reason for reluctance to record these missing, yet known, assets is clear - their ownership is not completely clarified, and utilities consider their depreciation as additional cost that will not be covered by proportional tariff increase. Ownership in general is defined as "public" and mostly with the local self-government, but in practice many cases show that such assets were recorded as ownership of the local utility (as shareholders' company, with private shares too) [6].

Environmental and resource costs are not fully neglected in Western Balkan, as it could look like - actually they are usually observed through different fees, not being part of the tariff and collected but not considered as income of the water utilities. Such fees are labelled as water protection fee, water use fee, fee for protection from water, development fee. Nevertheless, level of these fees is rather politically agreed than evaluated based on above written definitions (which are anyway not followed with specific calculation method proposed).

Croatian Government in its Regulation on the lowest basic price of water services and the type of cost to be recovered with the water prices, adopted in 2010, in its article 4 defines that the costs recovery relates to material costs, cost of services, cost of concession fee, staff costs, financing costs, depreciation of long-term assets, costs of the value adjustments

of short-term assets, and defined water fees. This regulation does not address the two mentioned issues, of costs accounting separately for different services (by cost centres), or of the fixed assets books completeness and consequently adequacy of the calculated depreciation [7].

Serbian Association of Cities and Municipalities, within a project funded by Swiss Agency for Development and Cooperation - SDC, published in 2013 Unique communal services tariff setting methodology. This document leans on key tariff setting principles from the Serbian Law on Communal Services, which will be mentioned individually in the following [8].

It also stresses the costs recovery, even pointing that it is the most important of five selected principles, but also recognizes its imprecise and selective implementation. The document clearly requests separate recording of expenses for each of the services provided, even defining the need for key other costs allocation (where the document refers actually to non-communal services provided by specific utility, while it could be also related to common departments like management or accounting that work for all, and their related costs). This act also does not specifically address issue of fixed assets book completeness.

The Energy Regulatory Commission of the Former Yugoslav Republic of Macedonia (FYRoM) in 2017 adopted the Methodology for setting of water service tariffs. Article 5 of the documents lists the costs to be recovered as operating costs including maintenance costs, costs for capital investments, and taxes, charges and other fees. Article 17 clearly addresses need for separate accounting records in its calculations for each of the services provided separately, requesting both the consolidated balance sheets for all activities and balance sheets with overview of revenues, expenditures and operating results for each activity separately. Neither of these legal acts addresses the issue of fixed assets book completeness and consequently appropriateness of calculated depreciation and level of funds for network renewal [9].

## 2.2 Affordability principle

As said, the human right to water and sanitation presumes that these services must be affordable. That practically means that an average family can pay from its income the average consumption per person for the set tariff. This principle actually defines highest applicable tariff rate, linking the invoice for average consumption of a family to its income. Water and sanitation invoice is often considered as limited within the range of 3% to 5% of the total monthly household income. It is clear that there will always be a certain number of households who cannot afford to pay their water and sanitation invoice - but they should be registered and assisted in other way, for example with subsidies for limited consumption: Reducing the water tariff for all consumers is not appropriate and leads to lack of financial sustainability.

In BiH practice, relatively recent and mostly related to internationally funded projects, affordability is usually limited to 4% of the total monthly household income for the water and sanitation invoice (without clear indication on the related consumption). But evaluation of a total family's monthly income in local community is not an easy task, such information is not provided by any statistic offices, and is mostly estimated. Besides wages, for which records exist, it also includes family income (direct or opportunity) from agriculture, tourism, services, rentals, regular financial support from relatives etc. - quality data on these can hardly be obtained [6].

Hence, in terms of affordability, instead of the ratio of water invoice and family income another indicator is sometimes used - that is ratio of Total annual costs of user of water and sanitation services (individual user) and Gross National Income (GNI) per capita, given as a percentage. Affordability is than limited to 2% (including for wastewater treatment).

Serbian Unique communal services tariff setting methodology also recognized the problem of assessing real family monthly income, and recommends using net salary instead. Affordability is defined as maximum of 3% for average monthly invoice for water supply compared to average net salary, but additionally as maximum of 2% for average monthly invoice for sanitation compared to average net salary [8].

Croatian Regulation on the lowest basic price of water services and the type of cost to be recovered with the water prices does not specifically address affordability [7].

FYRoM Methodology for setting of water service tariffs in its article 4 sets that the total household water services have to be affordable, and that for this purpose local average household income should be taken into the account. Nevertheless, affordability threshold is not clearly set with this regulation, it is just mentioned.

With deciding on the tariff level the household affordability threshold in the local area should be taken into consideration [9].

This is very important principle to be observed when deciding on the water tariff, but it should not be misunderstood. Exceeding the affordability level threshold would jeopardize operations of the water utility, since the collection rate would probably decrease and gap in needed financial funds would appear. But this principle should be primarily taken into account when deciding on new investments into the water supply and sanitation system. New investments always are followed by increase of costs, if not being distributed to proportionally increased number of consumers that has to impact tariff level. And if new needed level is above the affordability threshold, such investment should be reconsidered (delayed, replaced with cheaper options, partially financed…).

## 2.3 Polluter pays and user pays principles

This principle aims allocation of costs related to pollution control, and it was introduced with the OECD Recommendation C(72)128 on Guiding Principles Concerning International Economic Aspects of Environmental Policies in 1972. Pollution prevention and control measures expenses should be borne by the polluter, aiming to maintaining the environment in an acceptable condition. Cost of such measures should be incorporated into the cost of goods and services causing pollution in production and/or consumption [10].

Article 9 of the EU Water Framework Directive (WFD) specifically writes that the recovery of costs for water services should be in accordance in particular with the polluter pays principle. The same article also stipulates that different water users, like households, industry or agriculture, should provide an adequate contribution to the costs recovery, what is a kind of extension of Polluter pays principle also to User pays principle [3].

Croatian Regulation on the lowest basic price of water services and the type of cost to be recovered with the water prices does not specifically address this principle, maybe considering it met with the cost recovery for collection and treatment of waste water. In its article 3 it also leaves the room for having different water tariffs for different users' categories, what is actually long-lasting practice in the most of the Balkans [7].

FYRoM Methodology for setting of water service tariffs in its article 4 requests for gradual application of the polluter pays and user pays principles (as well as cost recovery principle). Article 8 writes that the water supply tariff shall be set for the entire service area. Methodology also recognizes different categories of users, but in its article 19 requests that their (presently different) tariffs have to be gradually harmonised within the regulated period [9].

Serbian Unique communal services tariff setting methodology specifies polluter pays principle as one of the key ones to follow. It also clarifies that it actually means that implementation of this principle aims avoidance of wide distribution ("socialization") of pollution remediation costs and that it should be understood as internalization of negative external effects of the service provision. User pays principle is also stressed; since the document relates to all kinds of communal services, underlined is need for metering, where

applicable, in order to strictly apply this principle. Document underlines as additional principle of "Same tariff for same service". It requests ending the practice of lower tariffs for households than for businesses, even calling it a discrimination with hidden subsidizing.

Transition period of at least two years is proposed for implementation of equalizing these tariffs [8].

UNDP tariff methodology relates polluter pays principle to the costs of sanitation services, but also stresses its potential relation to possible environmental damages during the construction or operational use of the water supply system. The methodology also separately underlines the User pays principle, stressing that the costs incurred by a specific user or a group of users should be borne by this very group. BiH local self-governance and water utilities widely practice higher tariff rates for legal then the physical persons, thus actually cross subsidising one users' category (households) by another category (businesses or administrations) [6].

In general, interpretation of the polluter pays principle varies - the term 'polluter' as used in the WFD should be interpreted in the broad sense, since strictly speaking water supply does not cause any pollution (as sanitation does). But even though water supply service provision with high abstractions does invoke pressure to the environment and makes more difficult to reach WFD objectives, valuation of related costs is not clearly defined.

## 2.4 Equity and equality principle

This principle is widespread, but not always with this name or with the same understanding. It relates to securing water supply to all local population under equal or similar conditions. UN General Assembly adopted Resolution 64/292 in 2010 which recognizes the human right to water and sanitation. Clean potable water and sanitation are stated to be essential for the realisation of all human rights. Right to water is defined as the right of any person to sufficient, safe, acceptable and physically accessible and affordable water for both personal and domestic uses. This is the interpretation of the principle within the UNDP tariff methodology [6].

Croatian Regulation on the lowest basic price, as well as Serbian Unique communal services tariff setting methodology, do not specifically address this principle [7], while the FYRoM Methodology for setting of water service tariffs in its article 4 requests for gradual application also of the principle of equity. Article 19 mentions again this principle, but within a context of gradual harmonisation of tariffs for different categories of users within the regulated period [9].

This principle is actually more related to provision of water supply and sanitation services, than to tariff setting, so it is not a surprise that is not mentioned in many tariff related documents.

## 2.5 Environmental efficiency principle

EU WFD requests "prudent and rational utilisation of natural resources", what in terms of provision of water supply services means optimizing water abstraction and distribution, minimizing water losses and promoting rational water use. UNDP tariff methodology mentions water charges on use of ground and surface waters, water conservation, abstraction from watercourses, charges which would neutralise possible adverse environmental effects that occurred during the construction or exploitation of the water supply system, and similar as possible tools for implementation of this principle. Another option could be increasing block tariffs for different consumption levels, with primary aim to stimulate users to rational water use, avoiding thus threatening the existing capacities with inordinate water consumption [6].

This principle is in line with the request of EU WFD for cost recovery for resource and environmental costs, where the focus is not anymore only to recovery of induced costs, but more to minimizing such costs, still without any major decrease of water services quality. Croatian Regulation on the lowest basic price only mentions fees on water use [7], Serbian Unique communal services tariff setting methodology also does not specifically address this principle [8]. FYRoM Methodology for setting of water service tariffs in its article 4 defines that the aim of the methodology is also to secure environment protection and development, but does not go further into details how to achieve that [9].

And this principle is actually good introduction into the following one, which could be the key for achieving long-term financial and operation sustainability of the water utilities.

## 2.6 Economic efficiency principle

This should be a generic principle to be applied for any kind of goods production or services provision, so universal that it is rarely mentioned for that reason. Even though it is considered as implying, in the Balkan water services provision practise it is not commonly applied. UNDP Tariff methodology states that this principle includes, for example, proper assets management and minimization of real losses, but also minimized staff number that are still able to implement all needed operational activities. But the present state of the art in this sector in BiH, but also in other Balkan countries, is such that many water utilities operate with quite high non-revenue water, both administrative and real losses, what hampers sustainability of quality services provision [6].

As been countries in transition, with relatively high unemployment rate and with history of dominant public employments, it does not come as surprise that water utilities often have overemployment, still with inadequate staff qualification structure. Taking into the account that the staff costs are in most cases the highest individual cost item, and that it is always the first priority to be actually paid, it is clear that the lacking investment maintenance funds could be partly found with the staff optimization measures [6].

Very important to stress is also quite sketchy responsibility for fixed assets maintenance. Assets are often not fully recorded in the books, partly since the ownership is interpreted as not clear, but also partly since the depreciation cost is a burden that utilities would prefer to avoid. Such practice inevitably leads to incomplete depreciation calculation and thus lack of funds for network renewal and its gradual deterioration [6].

Croatian Government in its Regulation performance indicators of water utilities, adopted in 2010, prescribed list of indicators to be monitored on (economic) efficiency of water utilities operations, structured into six categories. These indicators include many of those mentioned also in the UNDP Tariff methodology, but do not provide target values for any of them, enabling thus mutual benchmarking but the actual evaluation of operational efficiency level is not quite clear [11].

Serbian Unique communal services tariff setting methodology also just suggests "indicative" list of performance indicators on utility operational efficiency to be monitored [8].

FYRoM Methodology for setting of water service tariffs in its article 17 prescribes that utilities providing two or more services have to prepare consolidated balance sheets for all services and balance sheets with overview of revenues, expenditures and operating results for each service provided separately, what is a key precondition for enabling monitoring of economic efficiency of the utility. Article 18 gives very detailed list all the costs to be recovered, which indirectly leads to efficient assets management and decrease of non-revenue water. Article 22 defines key performance indicators to be monitored for verifying the objectives to be met by the water service providers. Still, this act also does not address often existing issue of needed staff optimization, in terms of both staff number and qualifications, what does affect the costs level [9].

## 3. CONCLUSION AND FINAL REMARKS

Above described key principles to be taken into the account when deciding on the water tariffs are at different levels observed within the Balkan countries. In general, all agree on cost recovery principle, but its actual implementation is hampered by inadequate costs accounting, where costs related to different services are jointly recorded and separated. Also investment maintenance costs (network renewal) are not properly evaluated for the incompleteness of the fixed assets books, or sometimes for obsolete and for the present unreal values recorded.

It is very good that these countries acknowledged the affordability principle, but that is not followed by implementing surveys on actual local affordability level, which is just roughly estimated and often not used within the tariff evaluation studies.

Economic efficiency is the principle that should strongly be taken into the account, it is actual balance towards the full and unlimited implementation of the needed cost recovery principle. If deciding on cost recovery without any boundaries (if affordability is vague) only commitment to this principle would keep the sector from further increased overemployment and other unjustified costs like excessive non-revenue water.

## 3. LITERATURE

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