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## The Water Pricing Effects on the Water Use of the Hungarian Households

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### **Abstract**

*Hungary has remarkable surface and subsurface water resources which result in important comparative benefits. In Hungary, before the political change, the water prices were determined by the state. According to the underlying principles of the communism, the water prices were very low as well. After the political and economical change in Hungary, from 1990 the water market started to be oligopoly-like: today the water supply is managed by regional water-work companies which are operating under state coordinated frames (e.g. price allowance, state-fixed prices containing profit). The consequences of the changeover to the capitalism have several effects; there is a need for the validating of the real costs and the environmental aspects in the water prices. This new approach led to the increased water-prices. In this study, the reaction of the Hungarian households to the growing of the water-rates is examined. The research work is based on primary statistical data. The analysis shows that the water consumption is hardly decreased and the sparing of water became more important. The study overviews the Hungarian water consumption structure as well.*

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## 1. Introduction

The supply of water and the treatment of wastewater are often considered as natural monopolies.<sup>1</sup> In the past, the role of competition in these sectors has been very limited, not only because of the natural monopoly characteristics of the industry, but also because of government regulations and artificially low pricing that would deter entry. Governments at local and sometimes national levels made decisions that led to substantial inefficiencies in the allocation of water and to inefficiencies in water company operation.

However, there is now an increasing recognition that, while competition may not be feasible in many areas of water operation, there are areas of the water allocation, supply and processing chain in which efficiency can be improved and in which competition can play an important role. The possibilities for such competition are coming to the fore as water and water treatment move toward privatization and prices rise to reflect costs. Regulators, operators, and customers should seriously consider at least some of these options because they can enhance efficiency.

Subsidization has deterred competition in many cases because the cost of water supply and of water treatment has been greater than prices charged. Subsidization existed initially because urban water and sanitation systems were built to increase public health, even though individuals would not have chosen to pay for these systems themselves. The ongoing subsidization has both created a number of chronic inefficiencies in the water distribution and cleaning system as well as deterring entry. In the OECD countries, incomes are now large enough that the costs of water systems can be borne directly by users. As a result, after many years of low maintenance under public governance and of inefficient provision, countries are choosing to privatize operations and to increase prices to reflect the infrastructure costs of water provision, the opportunity costs of the water source, and the infrastructure and treatment costs of wastewater (OECD, 1999).

Water policy is most complex when supplies are scarce. If supplies are plentiful, the economic problems related to water are primarily (1) making sure an appropriate consumer price is set that will cover fixed costs, extraction and maintenance and (2) enhancing productive efficiency. However, when supplies are scarce, the allocation problem of determining who will receive water is very difficult. Providing a particular user with additional water means depriving another user of that water. Markets are a standard way of allocating a resource in the presence of this kind of scarcity, but they will not always work well with water. There are at least four reasons that pure market allocations will not always work. First of all, rights must be allocated clearly for rights to work and this clear allocation does not always exist. Second, the number of water owners and buyers is limited, so perfect competition will not arise. Third, the social costs of water may not coincide with

private costs. Fourth, the social benefits may not coincide with private benefits. These reasons for market failure need not suggest that trading of water rights, for example, would not improve water allocation from its current state. Rather, they suggest that appropriate price or value of water should be based on its value upstream, downstream, and with different users, including the environment. Most importantly, the opportunity cost of water should be taken into account in allocation decisions (Fisher et al, 2000).

## 2. Material and Methods

The water-usage independent flat-rate system in which rates are the same for all and-users or they depend on characteristics of water usage does not initiate efficient water usage and is not fair for the society.

The purely water usage dependant one-factor rate system creates an unstable situation for suppliers whose income depends exclusively on the amount of water supplied that has significant and unpredictable changes. The one-factor rate system does not guarantee constant coverage for the fix costs (about 70%-t) of water- and sewage expenses. It does not encourage for sustainable water usage since it does not punish excessive water consumption.

The two-factor rate system applied in several countries decreases the risks of suppliers and creates a more even share of expenses water usage than the water usage dependant one-factor system, but at the same time is in unfavorable for those using less than the average that is also not fair from the society point of view and encourages for consumption of huge amounts that is unacceptable from sustainability point of view.

There is a fix several step system applied in more and more countries that builds up of water-usage-dependant progressively increasing blocks. Such a rat system provides fairness in society and environment sustainability at the same time since basic needs are supplied at low rate and high rates related to huge consumption encourage reduced usage and this way creates a financial base for investments and also for financing lower price reduced water usage. A rate system like this efficiently ensures reaching environment-sound and society related goals and also financial stability of water and sewage services.

In Hungary 60% of drinking water processed by public utility services is utilized by inhabitants and 40% by economic and public services (Chart 1). Loss of water, that is the difference between the amount of water processed by supplier and the amount sold at water consumption measuring stations, is about 19%. Quality of 42% of drinking water for some parameters is below the limits regulated by decrees specifying drinking-water quality. In the latest 10 years industrial water usage has decreased at different areas in different rate (Ministry of Environment and Water, Hungary, 2005).

In our examination we chose the method of processing of the primary data based on different statistical sources. The primary source of data water use is the so called “Yearbook of Housing Statistics” and the “Public Utilities”, surveys carried out every year by the (Hungarian Central Statistical Office (HCSO)). In our study we are analyzing the HCSO’s related data according to our point of view.

### **3. Results and Discussion**

Hungary has a very good situation regarding the public water supply. It has remarkable surface and subsurface water resources which result in important comparative benefits. The water quality is excellent and the tap water – in contrast with the situation in most European countries – has drinking-water quality.

#### **3.1. Water market characteristics in Hungary**

Water supply in Hungary could generally be described as a sector characterized by a large number of natural monopolies including certain elements of non-commercial services. However this situation is not applicable to the whole of the sector.

The supply of healthy drinking water and the treatment of sewage is an obligation of municipalities. This obligation is fulfilled mainly through the previously state owned public utilities transferred to the municipalities during the political changes at the beginning of the 1990’s. The negotiability of these properties is restricted. Certain assets such as those which are necessary for supplying more than one municipality, e. g. regional utilities, remained in the property of the state and were declared non disposable.

State owned property (the regional public utilities and the assets which the municipalities were not willing to take over) is operated by five state owned property-managing undertakings. Their activity is supervised by the Ministry of Environment and Water. Municipal property is managed mainly by the legal successors of the previous incumbent firms while smaller villages set up jointly controlled undertakings to assume this responsibility (Ministry of Environment and Water, Hungary, 2005).

In general it can be established that there is no space for competition between the suppliers of water.

#### **3.2. Consumer Pricing and Access**

In the case of private suppliers prices are determined in the concession contracts. Other prices are established by legal acts of the municipalities.

As the Act on Prices establishes only a general framework of the rules for the price-setting of water supply, a great variety of price schemes are applied in Hungary. A significant part of these schemes limits the calculation of the price to one factor, namely the actual consumption of the user. In the other cases the price consists of a fixed fee, which is designed to cover the maintenance of the infrastructure and another amount proportionate to the consumption is added. The fixed fee is often established in places where small users would not otherwise contribute to the maintenance of the infrastructure to an appropriate extent through the price of the small amount of water they consume (Németi, 2005).

Depending on the objectives followed by the municipality a differentiation can be made between the unit-price of water for households and that for industrial users in both price schemes.

The amount of the fix fees is 86 to 360 HUF (0,3 to 1,4 €) per month for households and 86 to 3.120.000 HUF (0,3 to 12.430 €) per month for industrial users, while the price of a cubic meter of water for these two groups varies between 22 to 316 HUF (0,09 to 1,26 €) and 82 to 2018 HUF (0,3 to 1,26 €) , respectively. Peak hours and shortage periods are charged at unchanged prices. However a limitation on the amount of water available is possible. The relevant Act determines a sequence of priority for such restrictions.

Prices may differ according to the price scheme applied by the municipality or the stipulations of the concession contract. In certain areas where the price of water exceeds a certain amount per cubic meter the state contributes to the costs of consumers. An additional contribution may also be provided for people with an income below a certain level; the contribution paid for these poor households amounted in the year 2002 4,9 billion HUF (~20 million €).

The ratio of drinking water and sewage expenses of households per head in the annual income was 1.7 % on the average in 2002.

According to the survey of April 2004 the weighted average of public water rates was 163,99 Ft/cubic meter, while that of the public sewage rates was 148.64 Ft/cubic meter. The weighted average of non-public rates were higher than these, for drinking water is was 176.85 Ft/cubic meter, and for sewage service is was 173.86 Ft/cubic meter (HCSO, 2004).

As of January 1, 2005 the state-owned regional water supply company changed from the previously used one-factor rates to the two-factor rates. There are several public authorities in Hungary applying the two-factor rates for several years. Based on national experience due to the introduction of the two-factor system habits of water usage of inhabitants and amount of water used have not changed significantly.

The one-factor rate system applied by most of the suppliers in Hungary currently does not cover the fix costs that is about 70% of all the maintenance carried out in drinking water process and sewage service, this way it does not meet the principle “end-user pays” or in other words the principle of counter value in balance with the service since service readiness is considered as a kind of service. The one-factor rate does not encourage sustainable water usage. As a consequence of all modernizing the rate system is reasonable, that means changing to the several-factor water rates that ensures sustainability and also fair from society point of view and contains fix and increasing rate block tariffs depending on amount of water used.

Water pricing is a significant point for sustainable development, since the price of water shows the value of water to users and this way encourages for more efficient, economic and environment-sound water usage. Figure 1. shows us the Hungarian household’s reaction to the growing of the water-rates.

#### **4. Conclusions**

The water price must be an equivalent mark for water users regarding social expectations related to water usage. For a lot of user the fact that the financial costs make up only a portion of water usage costs is not obvious. It is important that the users know clearly the real price of water, what they pay and why, and what kind of costs are involved in the price. The water- and channel prices are motivating only if it is tailored to the amount used. Goal is to educate users to be more economic and environment considerate and this way become more efficient in water usage that is influencing water using behavior.

In order to develop water using consciousness installation of water consumption gauges should be encouraged. Also installation of efficient water usage devices and investments aiming to efficient water application should also be supported. Contamination avoidance and supporting systems enables re-use of sewage water must gain high importance.

Water prices determined effectively will have a positive impact on reduced water contamination, ensures sustainability of water sources, efficiency of water use, and efficient proportioning of water among users. This way infrastructure of water- and channel services can be better determined and water supply becomes cost-effective. Due to the more cost saving water usage capacity of water suppliers can be reduced and investments might become unnecessary. An effective rate system provides proper financial resources for maintaining and developing infrastructure and for environment protection.

Based on the “contaminating or using party is paying” principle that ensures sustainable development that prevails also in the Water Governing Principles of EU, the water prices must contain all the costs related to water usage, including also

external costs from what only in the following cases can be deferred based on social considerations:

- Financial costs of water supply including capital expenses of loans required for operating, maintenance and infrastructural investments and also administrative expenses.
- Environmental costs of water supply that covers the damages caused to ecosystem due to water usage.
- The price of water must also reflect the costs of water supply “power source”, and the social costs that mean the costs missed chances of potential users cannot get water due to rate of water exploitation exceeding natural regeneration of water as resource.

The good price system would reach its goal via the impact made on demand. The amount of water is ideal if the marginal utility gained from water usage is equal to the economic, environmental and power source marginal costs of water processing. Prices can be determined well in theory knowing the demand, the supply, costs and profits. The flexibility of demand and supply relation and also that of costs of contamination elimination must be estimated. Although the flexibility of relation of marginal costs and water demand is difficult to calculate exactly in practice, though there are attempts to this but mainly in Anglo-Saxon countries.

Taking all the above into consideration due to the different sustaining, operating and capital cost and due to the water usage it would be logical that the water- and channel service prices are changing based on geographical zones and/or on time, such as on daily or seasonally. Measuring usage within the day would be very difficult and expensive from technical point of view, and is not widely used in the public water-fee system. The differences in prices according to geographical zones might hurt equality of chance, and the principle of social equality.

When determining the rate system, they are the households that should get the highest proportion out of the main water users. The industrial users either have their own water resource, and often they have their own water cleaning company, or as users of huge amounts they sign a specific contract with suppliers. Agriculture usually provides its water needs for watering from its own resources and obviously the sewage channel fees do not refer to them.

Summarizing the characteristics of an efficient rate system: it encourages to environment efficient water usage; covers the costs of water supply; provides access to water to everyone; transparent.

The rate system most ideal from a lot of points of view would contain a base fee containing a low amount of charge-free water usage and progressive fees to be paid according to levels of usage. In Hungary prices are influenced significantly by

the state fee-support system and its goal is to keep fees at a constant rate in the unfavorable areas. Due to the fee-supporting system the water- and channel fees in the country do not pass a specific limit determined yearly, and the investments higher than that are compensated by the state.

According to several opinions this type of support is not totally EU-conform, so in the future a significant reform will have to be completed in it. In the future in the process of deciding about supports it is likely that social considerations will have a most important role versus supports given based on subjective right.

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