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PREFACE

The Danube Regional Project (DRP) consists of several components and numerous activities, one of which was "Assessment and Development of Municipal Water and Wastewater Tariffs and Effluent Charges in the Danube River Basin" (A grouping of activities 1.6 and 1.7 of Project Component 1). This work often took the shorthand name "Tariffs and Effluent Charges Project" and Phase I of this work was undertaken by a team of country, regional, and international consultants. Phase I of the UNDP/GEF DRP ended in mid-2004 and many of the results of Phase I the Tariffs and Effluent Charges Project are reported in two volumes.

Volume 1 is entitled *An Overview of Tariff and Effluent Charge Reform Issues and Proposals*. Volume 1 builds on all other project outputs. It reviews the methodology and tools developed and applied by the Project team; introduces some of the economic theory and international experience germane to design and performance of tariffs and charges; describes general conditions, tariff regimes, and effluent charges currently applicable to municipal water and wastewater systems in the region; and describes and develops in a structured way a initial series of tariff, effluent charge and related institutional reform proposals.

Volume 2 is entitled *Country-Specific Issues and Proposed Tariff and Charge Reforms*. It consists of country reports for each of the seven countries examined most extensively by our project. Each country report, in turn, consists of three documents: a case study, a national profile, and a brief introduction and summary document. The principle author(s) of the seven country reports were the country consultants of the Project Team.

The authors of the Volume 2 components prepared these documents in 2003 and early 2004. The documents are as up to date as the authors could make them, usually including some discussion of anticipated changes or legislation under development. Still, the reader should be advised that an extended review process may have meant that new data are now available and some of the institutional detail pertaining to a specific country or case study community may now be out of date.

All documents in electronic version – Volume 1 and Volume 2 - may be read or printed from the DRP web site (www.undp-drp.org), from the page Activities / Policies / Tariffs and Charges / Final Reports Phase 1.

We want to thank the authors of these country-specific documents for their professional care and personal devotion to the Tariffs and Effluent Charges Project. It has been a pleasure to work with, and learn from, them throughout the course of the Project.

One purpose of the Tariffs and Effluent Charges Project was to promote a structured discussion that would encourage further consideration, testing, and adoption of various tariff and effluent charge reform proposals. As leaders and coordinators of the Project, the interested reader is welcome to contact either of us with questions or suggestions regarding the discussion and proposals included in either volume of the Project reports. We will forward questions or issues better addressed by the authors of these country-specific documents directly to them.

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Overview of Issues and Proposed Tariff and Charge Reforms: Hungary

The present document consists of two chapters, following the issues and reform recommendations of the National Profile and the Case Study, respectively.

1 Overview of the National Profile

1.1 Background

The national profile is, first of all, a compilation of information and data that describing the institutions and conditions that shape and characterize the provision of municipal water and wastewater service in Hungary . The purpose of this compilation is to provide background and inspiration for proposals to reform both the current system of water and wastewater tariffs and effluent charges and coincident proposals to adjust or modify the legal and regulatory system within which the these tariffs and effluent charges function in Hungary.

Since 1970 the structure of the water and sewerage sector in Hungary has been changed dramatically. In the 70's the Hungarian waterworks were organised in 33 state-owned companies.

In 1990 the ownership of the majority of water and sewerage infrastructure has been passed to the local governments. The transformation of companies owned by the state and the local councils has begun. In 1991 and 1992 the 33 water companies were replaced by five regional and a vast number of local companies held by the new local governments. This process resulted in an extremely fragmented structure. By the end of 2001 altogether 369 companies supplied drinking water and/or sewerage services in Hungary.

In the past decade the water consumption (and therefore wastewater emission) decreased significantly due to the economic transition. The transition involved transformation of the industry, closure of some of the great water user factories and fall of the GDP. Increasing service prices and relatively low incomes resulted in the drop of water usage of the households.

The drinking water provision in the country reached a level that is reasonable economically and is available in almost every settlement (99.7 per cent), but it differs heavily by water quality (see section 6.4.1) and settlement type. Situation/provision of settlements with less than 15,000 inhabitants is the least satisfying, 11-12 per cent of the population within these municipalities has no connection to *piped* drinking water, but within distance of 150 m have access to pipe stands.

The level of sewerage lags far behind that of piped drinking water. According to the data of 1993, 43 per cent of the population was connected to the public sewerage system, 10 per cent owned appropriate sewage solutions without drainage, 21 per cent solved it inefficiently, and 26 per cent lived in areas without drainage [Somlyódy 2000]. Due to investments during the 1990's, wastewater services became available for 48 per cent of the households in 1998, and 53 percent in 2001, although the possibility for immediate connection is available for another 9 per cent. If one takes into account the settlements, the picture is darker because only one third participates in public sewage services. This shows that mainly the densely populated settlements, bigger towns and cities are canalised.

The gap between the level of drinking water and sewage service in Hungary is one of the greatest within OECD countries, where this difference almost doesn't exist.

The EU accession process has resulted not only in new pieces of legislation (see 2.1), but in expensive - and sometimes neither thought over, nor justified – investments.

1.2 Policy Issues

1.2.1 Efficiency

The decrease of consumption in the whole water sector - household and industry as well - over the last decade is due to price increases, economic decline and technology changes. The operation of the networks shows inefficiency, as the served quantities are very low, comparing to the capacity of the facilities. The efficiency situation is even worse than the sole effect of economic changes would

indicate as future system capacity requirements were already overestimated at the last national water plan in the 80's.

The sewage service has to cope with the scale problem as well: the utilisation of treatment capacities is low, in consequence of the low level of drinking water consumption. The connection rate of households has improved due to government actions, but still there are possibilities in this field. Under-utilisation of the existing capacities also drives unit costs up and decreases the willingness of households to make additional connections to the system. Regarding sewage treatment, additional asymmetries were generated in the 90s (when e.g. treatment plants have been built for a middle size town and the surrounding villages, while the network of pipes covers only a part of the town), as an adverse effect of the grant system.

1.2.2 Equity

The transformation of the institutional frame of waterworks service has resulted in large differences in tariffs for both services, occasionally even in one service district. This situation is based in part on scale differences of service providers and natural circumstances, but the different quality of management, and local political consideration as well. It is highly problematic that the price of a basic service can vary in the same area even twofold just because of ownership differences. This is an equity question, but this problem roots in the weak and unequal regulation measures.

To a limited degree, the Central Budget provides payments to compensate inequalities between high and low cost areas. In this way the state spreads above-limit-costs over a larger number of population, that local governments cannot achieve. This system, however, raises another question of equity, since above limit costs often originate from the fact that local actors lack the incentive of negotiation and to reach agreement in small-regional distribution problems, or simply there is a bad management, and as a result, taxpayers in general cover extra costs.

The non-use of (even) the newly built networks also generates equity problems. The present practice penalises the ones who co-operate, use the (new or upgraded) service and do not cause extra environmental harm.

1.2.3 Sustainability – Stability of operation

From its political perspective there is no clear cut (and widely accepted) view on how the cost burden of the whole network restoration, upgrade and expansion will be distributed among users and the state budget. The driving force of recent development policy is the criteria of the EU accession, embodied in the NationalWastewater Program, and the will to intake the accompanied EU funds. Meanwhile the financial requirements of these funds that will bind future users together with the enforcement of Water Framework Directive's cost recovery principle limits the possibilities of future considerations. But the prospected effect of these requirements on service costs has not been widely recognized yet.

This situation gives weak ground for discussions about the role of private capital in the service. Recently private capital participation is allowed up to 49% in municipality owned service providers, but this arrangement avoids answering some basic questions. The limit on private ownership is intended to protect the position of municipalities to control the services they are responsible for. At the same time, more threat to the service originates from the public owners lack of market regulation skills and the weak, unclear financial position the municipal sector has. Lack of skills keeps municipalities back to protect users' interest through regulation without exercising ownership rights and being involved in the operation and financial matters of a service itself. Weak financial position makes the municipalities unable to accomplish long term financial policies that result in dependency of the government initiated and financed programs (and in more or less natural misallocation of investment sources). Both leads to strong demand for capital involvement, but the lack of own resources pave the way toward bad and disadvantageous conditions of any type of capital provision. This is what really hurts users interest.

2 Overview of the Case Study

2.1 Description of the Case Study Area

2.1.1 Brief Historic Overview

The examined area is a sub-system of the North-Transdanubian Waterworks[1]. It is situated along the Danube riverbank where two towns and four villages are located, as well as several small communities uphill from the river. The total population of the district is around 80 thousand, half of the population lives in the two towns, and the other half in the villages, with populations between 500 to 5000.

The district is a mix of state and local government owned subsystems, that (except for a few network elements) are operated by a state owned regional water works company (RWW). The dominant owner of the network is the state owned RWW. The basis of the district is the regional water supply network that provides water from a bank filtered water basis and a karstic well to the whole area and sells water to supply a handful of small communities on the territory of the neighbouring regional system. The sewage systems of the district show a more complex picture. The towns and the villages next to them are serviced by a state owned network, operated by the regional waterworks company . The other sewage systems service small groups of (one to three) municipalities, these are owned by the municipalities.

2.1.2 Service Users

Households

The household groups mean residential customers in territory 1 to 7 (except 5). The portion of joint metered apartment buildings is very low. The division of households follows the territorial units. The average consumption based on the year 2001 is 84 m^3/household(max 100 m^3/household, min 75 m^3/household).

Non-household groups, Public Institutions

I create public institution as a single consumer group only in T1 (the biggest town in the area). This is because public institutions are concentrated in the towns, the proportion of their consumption in the villages are very low. In T3 however the small scale industry and the public institutions have similar water consumption/sewage production patterns, therefore there was no reason to differentiate among them. The group called "other" aggregates their consumption.

Industry

There are some big industrial users in the area and several small ones. The big ones locate in T1, T3 and T7. All of them have access to the drinking water network, two have their own water extraction facilities and all of them have installed pre-treatment devices on wastewater outflow to the public network.

Industry "A" locates in T1. It is a heavy industry site. It has its own wells, applies advanced water re-circulation technologies to optimise water consumption. The factory has a pre-treatment plant and loads the sewage to the public sewerage system. For modelling purposes water use and waste water discharge are handled as independent services.

Industry "B" in T1 was distinguished from all other industry. As their consumption pattern differs from Industry "A", for modelling purposes water use and waste water discharge are handled as composite services.

Industry "C" in T3 is a pharmaceutical factory. It has water supply from the public utility and has its own treatment plant.

In T7 there is a glass producer, that consumption is 12% of the territories' consumption and 62% of the industrial consumption, but the 15-group model capacity prescribe the compromise of merging all non-household customer and this is the smallest "big" industrial user. Cost allocation of the

[1] The basic data evaluated in this case study was provided by the EDV Rt, the calculations and the conclusions express the opinion of the author, not necessarily coincides with of the company. I would like to acknowledge their time and efforts to provide us the required information.

Spreadsheet model is based on the flow quantities a specific network element can be associated with. Big industrial users' cost structure includes their location's distribution and collection costs with a smaller weight (20%).

2.1.3 The list of user groups in the spreadsheet model

The main characteristics of the defined user groups in the year 2001:

User groups	No. of units	Drinking water consumption thousand m^3	Sewage quantity thousand m^3	Consumption pattern of drinking and sewage use
Households in T1	7200	626	488	Composite
Public in T1 *	610	313	283	Composite
Industry A in T1	1	31	156	Independent
Industry B in T1 *	322	161	127	Composite
Households in T2	1862	167	103	Composite
Households in T3	4968	387	315	Composite
Industry C in T3	1	356	315	Independent
Other small users in T3	369	163	136	Composite
Households in T4	5529	417	175	Composite
Other users in T4	247	98	8	Independent
Households in T6	295 (12)	26	20	Composite
Households in T7	2948	295	-	-
Other small users in T7	227	105	-	-
Purchasing water to T5	941(53)	99	-	-
Purchasing water to T8	-	174	-	-

* Number of all non-households are divided by their consumption

2.2 Scenarios - Lines of investigation

2.2.1 Baseline scenario

Short run, Current operation: This scenario deals with the current operation for up to one year. Computed cost include variable costs, that change as the serviced volumes change, and fixed costs that do not change with the volume of the services, but are necessary conditions of running the networks (i.e. salaries, maintenance). This scenario does not include capital costs of assets or amortisation.

2.2.2 Economic sustainability scenarios

Medium term economic sustainability: This scenario incorporates capital cost elements up to seven year lifetime. Volumes and tariffs are computed with the Cost Recovery requirement[2].

Long term economic sustainability: This scenario consists of all the capital cost of system elements that are shown in the RWW's book and system elements of municipalities owned networks that the RWW operates on a contractual basis. Capital costs are computed assuming that the necessary assets to cover future investments were provided from the capital market (present value of 4% real interest

[2] Without Marginal Cost Pricing

rate). Because the sewerage network of T5 will be completed next year, the long term restoration cost of this network part is included. Volumes and tariffs are computed with the Cost Recovery requirement .

Extra Investments for further nutrient load decrease on the long run: Although this service district is not ranked as sensitive territory, the scenario shows increased economic burdens if third phase (nutrient load reduction) devices were introduced. Volumes and tariffs are computed with the Cost Recovery requirement.

Balance of current revenues and total costs of scenarios (million HUF):

Balance of Current Revenues and:	Short run operation scenario	Medium run scenario	Long run scenario with "borrow policy"	Long run scenario with expansion and environmental upgrade, „borrow policy”
Water supply	110	78	-22	-14
Sewage service	-2	-155	-447	-613
Total	108	-77	-470	-627
Rate of highest and lowest household sewage price		2.7	5.7	5.6

The table below shows the changes of households' cost burden based on different scenarios. It reflects that the less advantageous small facilities cost increase substantially as the capital intensity of the sites grow. The comparison is based on the average household net income of the region. If the lower income groups are considered, water and wastewater costs can have an even higher share. (The lowest income deciles is 50%, the lowest quintile 62% and the second quintile 80% of the average income). Moreover the distribution of income is unequal, it tends to be higher in urban areas.

The allocated cost burden of households compared to the net household income of the region 2001:

Households	Current Operation Costs	Medium run with cost recovery	Long run scenario with "borrow policy"	Long run scenario with expansion and environmental upgrade, borrow policy
T1	1.7%	2.1%	2.7%	2.9%
T2	1.6%	2.1%	2.7%	2.9%
T3	1.5%	1.8%	2.4%	2.6%
T4	1.4%	2.7%	6.5%	7.2%
T6	2.9%	3.0%	7.4%	8.0%

Households average incomes: KSH, 2001

2.2.3 Distribution of cost burden

This analysis is based on the allocation of costs among the distinguished network parts (T1-T8). In the current situation there is a flat tariff for all the drinking water users and flat tariffs respectively by ownership. The baseline scenario spreadsheet model counts the distribution effects of this tariff. The model reflects the present financial flow, without cost recovery condition.

The cost allocation models reveal that the uniform tariff results in cross-subsidisation of households at the expense of industry. The small villages benefit more from the current tariff structure than the cities

of T1, T2 and T3, in spite of the more cost based prices of the sewage service (where, due to the municipal ownership the tariffs actually are two-three times higher). So the small settlements benefit more from the uniform drinking water tariffs than they "lose" due to the unequal cross subsidisation of sewage provision.

2.2.4 Efficiency gains of tariff structure reform

The Medium term sustainable scenario is the basis of the comparison of Cost Recovery and Cost Recovery with marginal cost pricing scenarios. This comparison intends to show the efficiency changes and the distribution effect of an optimal two-component tariff structure. The results verify that overall, the proportional change in volume of water exceeds the proportional change of the sum it costs to the consumers, making the average costs of water lower. That produces a 9% gain. But it is still not a widely accepted technique due to the conflicts such a tariff change would generate on local political fields. The T4, T5 and T6 territories would be worse off with this tariff change, these are the villages that are among mountains, or at the far end of the network. Usually in village areas the average income is lower.

2.2.5 Incentive measure to increase connection rate to the sewerage network.

This analysis is based on the previous one. As an additional feature, it counts the volume of a specific charge targeting households that do not connect to the sewerage network in spite of technical possibilities. Introduction of such a charge may result in a 20 percent increase in the total collected sewage water quantity (in case of currently under utilised systems).

2.3 Policy Recommendations Based on the Case Study

2.3.1 Local decision on financial policy, responsibility of inter-generational burden allocation

Experience:

Lacking financial strategies to obtain own sources for investments in the medium and long run.

Recommendations:

1. Regulatory frame in order to oblige owners to start accumulate funds for future investments

2. Provide information toowner municipalities about possibilities of financial markets to better represent the interest of present and future generations

2.3.2 Grant / Subsidy allocation

Experience: misallocation of financial sources of sewerage investments

Recommendation: Tighter supervision by regulators pe.: State Audit Office

2.3.3 Equity and complexity

Experience:

1. Efficiency gains on network level makes some user-groups worse off especially ones with small consumption and less ability to adjust their consumption

2. Worse off groups may leave the system and apply illegal solution that impose extra charges and costs to the communities

Recommendations:

1. Reconsider the conditions of current subsidy scheme of villages with extra high tariff

2. Tariff changes for efficiency gains have to be issued together – in package – with local initiatives that targeted more sustainable environmental resource use of the district.

3. Create guidelines with official backing on proportional allocation of costs between different consumer groups. These guidelines should provide information on how to match policy goals (express local values) with suitable rules of financing the operation, in order

- to facilitate self-reorganisation of the network for efficiency gains, or
- to create alternative ways to exit existing technical solutions of the networks on their edge. In form of: applying new small scale ecology driven solutions for small settlements, adjusting land-use patterns for safer resource use and harness ecological services of abundant local access to land (pe: Target oriented use of new financing possibilities of EU)