

Sava River Basin Management Plan

Background paper No. 6

Cost-recovery of Water Services

Case Studies of the countries

version 0.3

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1 Introduction

The assessment of current level of cost-recovery for water services is a requirement by Article 9 of the Water Framework Directive. Key elements to be investigated in the economic analysis include the status of water services, the institutional set-up for cost-recovery, the extent of the recovery of costs (financial, environmental and resource costs) of water services and the contribution of key water uses to the costs of these services, as well as the incidence of subsidies. The financial costs are investigated in two aspects: the recovery of operational and maintenance costs and recovery of long term assets (depreciation), which is connected partially with ownership of the assets.

The purpose of this background paper is to present the following case studies aimed at highlighting of parallels and differences across the Sava River Basin (RB) countries with regard to the varying aspects related to the implementation of economic analysis: cost-recovery.

Additional information is presented on Payment for Ecosystem Services schemes.

2 Methodology

A questionnaire has been created for collection of financial and economic information to the Sava River Basin Management Plan (RBMP) requested by Article 9 of the Water Framework Directive (WFD). The key points of Article 9:

- Member States shall: “take account of the principle of recovery of the costs of water services¹, including environmental and resource costs, having regard to the economic analysis conducted according to Annex III, and in accordance in particular with the polluter pays principle.”
- Member States are to ensure that by 2010: “water pricing policies provide adequate incentives for users to use water resources efficiently and thereby contribute to the environmental objectives of [the] Directive”.
- Member States should report in the River Basin Management Plans on the planned steps towards implementing incentive based water pricing policies and the recovery of the costs of water services.

The WFD does not address particularly the international river basin management plans in this regard, but it is recognised that improvement of basin-wide cost-recovery of water services is an essential tool for protection of water resources in the Sava RB.

The questionnaire is divided into the following sections:

- General information on service provider
- Current financial viability of services, tariffs and unpaid bills
- Ownership of assets and technical condition of operational assets

¹ **Water services** by definition of WFD: ‘38. “Water services” means all services which provide, for households, public institutions or any economic activity:

(a) abstraction, impoundment, storage, treatment and distribution of surface water or groundwater,
 (b) wastewater collection and treatment facilities which subsequently discharge into surface water.

- Calculation of need for re-investments, reconstructions
- Financial sources for re-investment, reconstruction
- Proposed steps and measures to improve cost-recovery

The case study accomplishes double function: (a) show the feasibility of the questionnaire for a possible national application in the future, and (b) based on detailed investigation of the current situation of cost-recovery at service provider's level, propose measures for Sava countries toward implementation of incentive pricing in the Sava RBMP. The questionnaire is presented in Annex 1.

Steps of survey:

- 1) Discussion, review and approval of questionnaire by RBM Group;
- 2) Selection of service provider for case study in each country (aspects to consider e.g.: size of operation, management rating, willingness to co-operate)
- 3) Translation of questionnaire into local language;
- 4) On the job training - filling in the Questionnaire by participation of ISTE;
- 5) Preliminary sending out questionnaire to the selected service provider's general manager and financial director of each country;
- 6) Meeting service provider in person and filling in questionnaire together with STE;
- 7) Translation the filled in questionnaire into English;
- 8) Forward to the International STE ;
- 9) Calculation of basin-wide cost-recovery and drafting chapter 10.6 of the Sava RBMP.

Note: Countries which have elaborated the national river basin management plan the cost recovery and incentive pricing – being primarily national issues – present according to the national plan in force.

3 Results of the surveys by countries - Case Studies

3.1 Slovenia

3.1.1 Cost –recovery of environmental and resource costs

There are three economic instruments for the recovery of environmental and resource costs of water services in the Republic of Slovenia. These are:

- Wastewater charge (okoljska dajatev za onesnaževanje okolja zaradi odvajanja odpadnih voda),
- Payment for water rights (Plačilo za vodno pravico) and
- Water use fee (Vodno povračilo).

The price setting authority for these economic instruments is the national government.

Wastewater charge:

Wastewater charge is determined according to the level of pollution (monitoring) and paid only for the discharge of:

- Industrial wastewater and
- Municipal wastewater.

There is no wastewater charge for the diffuse pollution from agricultural activities.

Table 1: Price of wastewater charge (Official Gazette RS, nr. 19/05, 120/05, 138/06, 8/08, 16/09 and 7/10)

Year	Price per Unit of Pollution (EUR)
2005	26.0224
2006 - 2010	26.4125

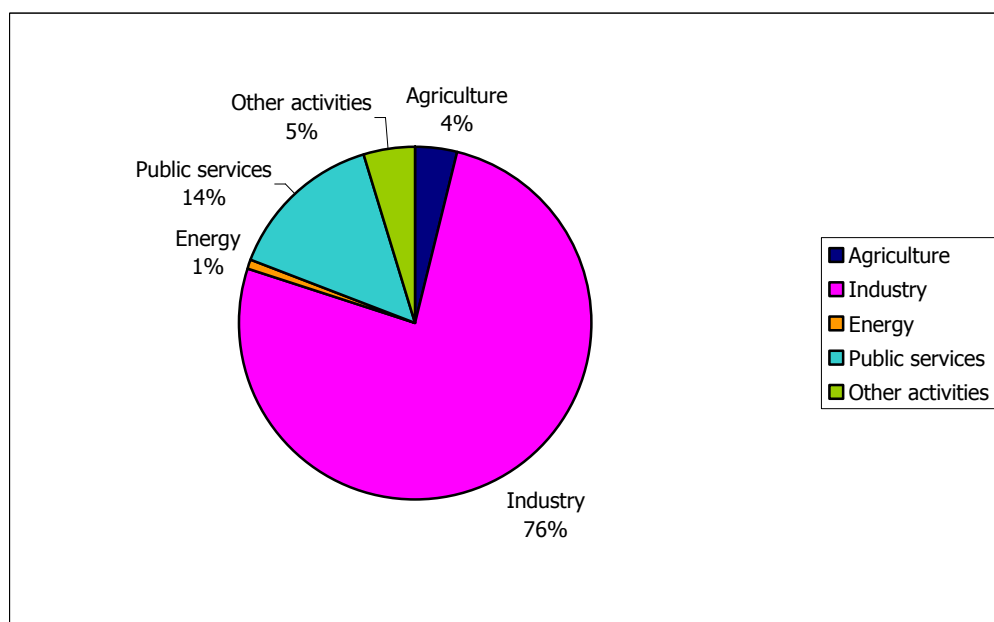
In Slovene part of Sava river basin there were app. 5.6 million EUR of payments of wastewater charge for industrial and municipal wastewater in 2005 (Table 2). Majority of the payments comes from sector Industry (Figure 1).

Table 2: Payments of wastewater charge for industrial and municipal wastewater in Slovene part of Sava river basin in 2005 (ARSO, 2008b; Institute for Water of the Republic of Slovenia)

Sector:	Standard Classification of economic activities SKD 2002 (according to NACE Rev. 1)	Payments of wastewater charge for industrial and municipal wastewater in Slovene part of Sava river basin in 2005 (EUR)*
Agriculture	A, B	217, 850
Industry	C, D	4, 220, 490
Energy	E (E41 excluded)	54, 060
Public services	E41, L, M, N, O, P	790, 600
Other activities	F, G, H, I, J, K	267, 870
TOTAL		5, 550, 900

*data included for municipalities with more than 75% of their area in Slovenian part of the Sava RB

Figure 1: Payments of wastewater charge for Industrial and Municipal wastewater in Slovene part of Sava river basin in 2005 (ARSO, 2008b; Institute for Water of the Republic of Slovenia)



Payments of wastewater charge for companies which invested in technologies for reduction of water pollution could be reduced until the year 2005. There was a possibility of wastewater charge reduction for municipalities, which invested in wastewater collection and treatment infrastructure until the year 2010. Payments of wastewater charge were the income of state budget until the year 2010. From then on, payments of wastewater charge are the income of municipalities.

Payment for water rights and water use fee

Payment for water rights and water use fee are charged for:

- water abstraction,
- use of water for hydropower production,
- gravel abstraction and
- use of waterside land, owned by state.

Payment for water rights is only obligatory for some activities (such as hydropower generation, gravel abstraction). Whereas payment of water use fee is obligatory for all water rights owners. Main objective of charging water use fee is to prevent excessive water use from economic and environmental protection viewpoints.

For public water supply there are no payments for water rights, only payments of water use fee. In year 2005 the price of water use fee for public water supply was 0.0547 EUR/m³ (in years 2006-2010 the price was 0.0555 EUR/m³) (Official Gazette RS, nr. 4/06, 138/06, 122/07, 22/08, 16/09 and 45/10).

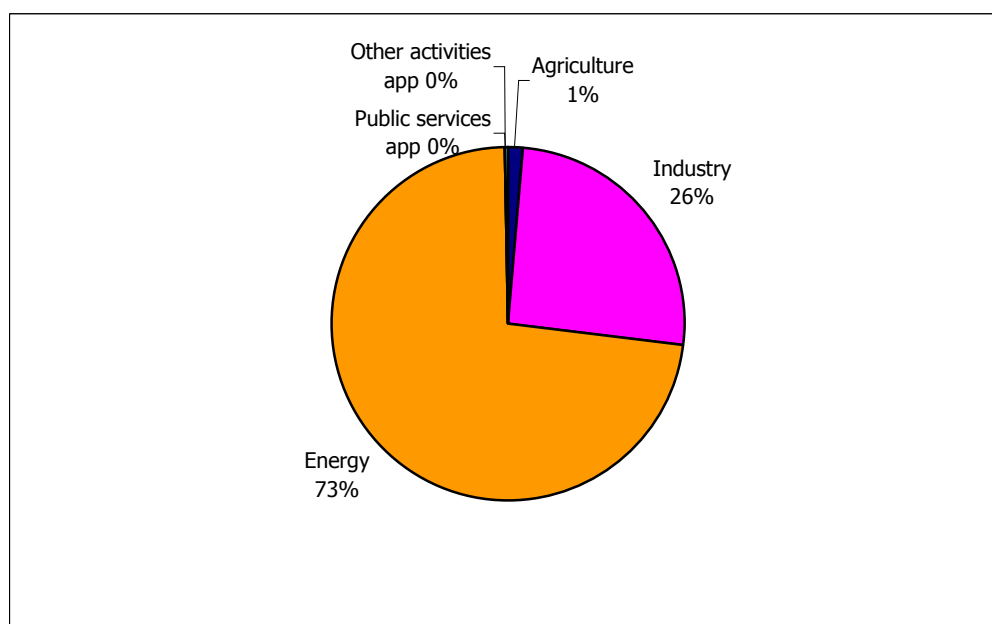
There was payment app. 1.2 million EUR for water rights in year 2005 in Slovene part of Sava river basin (Table 3). Most of the payments (73%) were made by Energy sector (Figure 2).

Table 3: Payments for water rights in Slovene part of Sava river basin in 2005 (ARSO, 2008c; Institute for Water of the Republic of Slovenia)

Sector:	Standard Classification of economic activities SKD 2002 (according to NACE Rev. 1)	Payments for water rights in Slovene part of Sava river basin in 2005 (EUR)
Agriculture	A, B	17,300
Industry	C, D	302,970
Energy	E (E41 excluded)	860, 200
Public services	E41, L, M, N, O, P	650
Other activities	F, G, H, I, J, K	2,260
TOTAL		1,183,380

*data included for municipalities with more than 75% of their area in Slovenian part of the Sava RB

Figure 2: Payments for water rights in Slovene part of Sava river basin in 2005 (ARSO, 2008c; Institute for Water of the Republic of Slovenia)

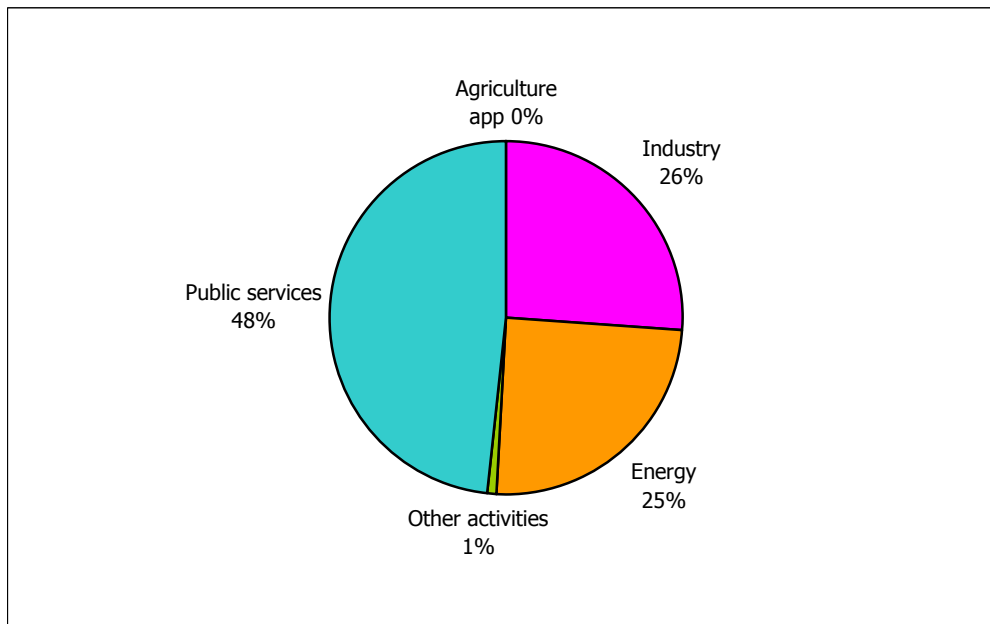


Total payments of water use fee in Slovene part of Sava river basin amounted to 11.7 million EUR in the year 2005 (Table 4). Almost half of the amount was paid by public services, mostly for water use fee for public water supply (Figure 3).

Table 4: Payments of water use fee in Slovene part of Sava river basin in the year 2005 (ARSO, 2008a; Institute for Water of the Republic of Slovenia)

Sector:	Standard Classification of economic activities SKD 2002 (according to NACE Rev. 1)	Payments of water use fee in Slovene part of Sava river basin in 2005 (EUR)
Agriculture	A, B	10 360
Industry	C, D	3 039 560
Energy	E (E41 excluded)	2 886 540
Public services	E41, L, M, N, O, P	5 663 410
Other activities	F, G, H, I, J, K	105 160
TOTAL		11 705 030

Figure 3: Payments of water use fee in Slovene part of Sava river basin in 2005 (ARSO, 2008a; Institute for Water of the Republic of Slovenia)



3.1.2 Public water supply and municipal wastewater treatment services

Public water supply and municipal wastewater treatment services are financed by users. Municipalities can provide subsidies for public water supply and municipal wastewater treatment services, only for the costs of depreciation of public infrastructure. These subsidies should not exceed 50% of the costs of depreciation of public infrastructure. It was assessed that in Slovenia such subsidies amounted to 38 million EUR in year 2006.

According to the Rules of tariff system for public service on the environmental field, prices for excessive public water supply use are 50 % higher, which promotes sustainable and rational use of water resources.

Average costs and prices for public water supply and municipal wastewater treatment services in Slovenia are shown in tables below (Table 5, Table 6).

Table 5: Average costs and prices in year 2006 (IREET, 2008; IREET, 2008a)

Denomination	Average Costs (EUR/m ³)	Average Price without taxes (EUR/m ³)
Public Water Supply	0.6801	0.5347
Municipal Wastewater Collection	0.3542	0.2504
Municipal Wastewater Treatment	0.4407	0.381

Table 6: Average costs and prices in year 2007 (IREET, 2009; IREET, 2009a)

Denomination	Average Costs (EUR/m ³)	Average Price without taxes (EUR/m ³)
Public Water Supply	0.70	0.54
Municipal Wastewater Collection	0.40	0.29
Municipal Wastewater Treatment	0.59	0.62

New infrastructure for public water supply and for municipal wastewater treatment is not financed through the price for these services. New infrastructure for public water supply is financed from state budget, municipal budget and from EU funding (MOP RS, 2006). New infrastructure for municipal wastewater treatment is financed from state budget, municipal budget, wastewater charge and EU funding (MOP RS, 2009).

3.1.3 Cost recovery of financial costs

Recovery of financial costs was assessed for public water supply service and for municipal wastewater collection and treatment only. Data on financial costs of other water services were not available.

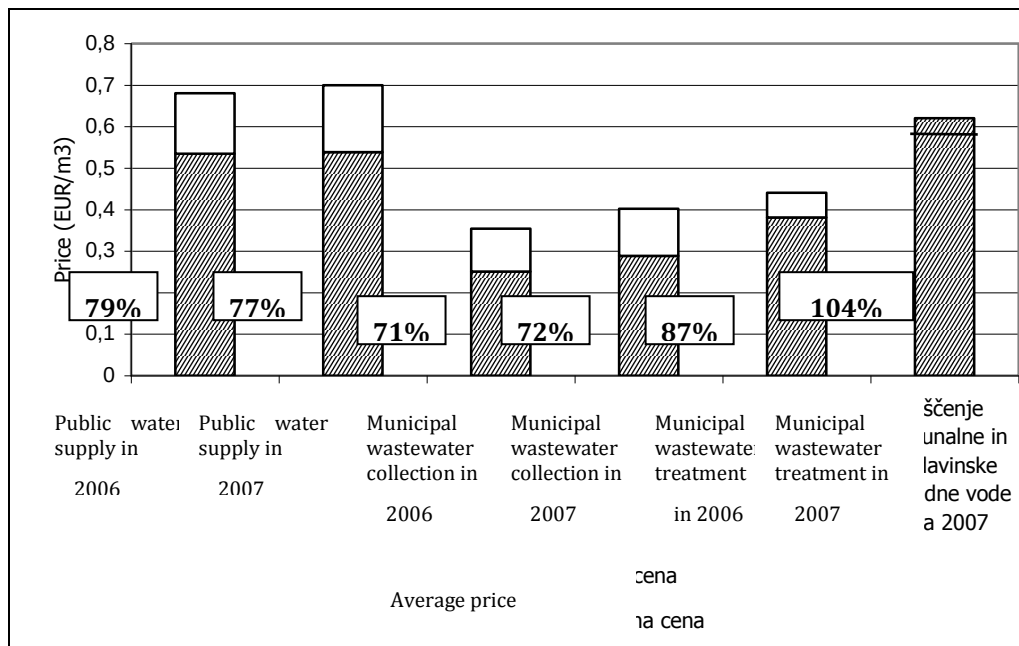
Financial costs of public water supply service, municipal wastewater collection and municipal wastewater treatment consist of:

- Operating costs,
- Maintenance costs,
- Capital costs (interests, depreciation).

Cost-recovery rate was assessed in 2 separate projects. First project “Izdelava metodologije za oblikovanje in spremljanje cen komunalnih storitev” was done by IREET, d.o.o. Cost recovery ratio for year 2006 was assessed according to the data of 211 municipalities for public water supply service, 156 municipalities for municipal wastewater collection and 106 municipalities for municipal wastewater treatment. Cost recovery rate for year 2007 was assessed according to data of 116 municipalities for public water supply service, 71 municipalities for municipal wastewater collection and 23 companies for municipal wastewater treatment.

According to the results of the project, cost recovery of financial costs for public water supply service and for municipal wastewater collection and treatment is mainly not achieved in the Republic of Slovenia. The cost recovery rate is shown in Figure 4.

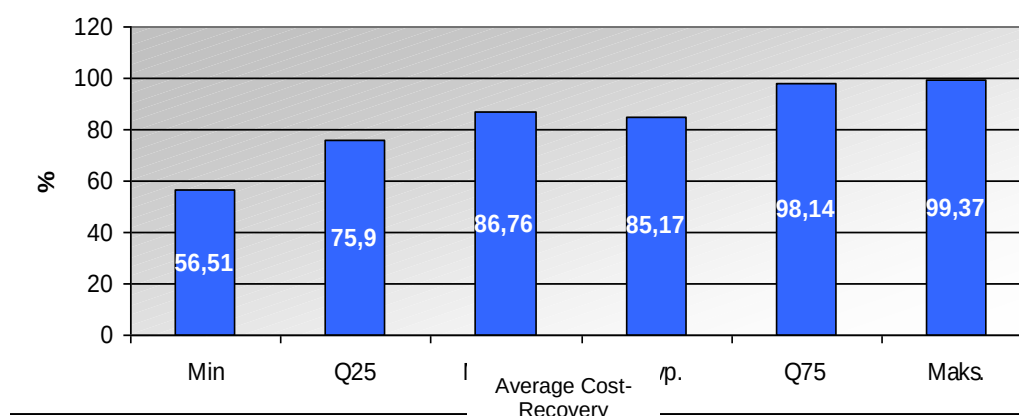
Figure 4: Cost-recovery rates of public water supply, of municipal wastewater collection and municipal wastewater treatment in years 2006 and 2007 (IREET, 2008; IREET, 2008a; IREET, 2009; IREET, 2009a)



Cost-recovery rate of public water supply was also assessed in the EU-Twinning project “Development of financial instruments for water management”. A pilot benchmarking project was carried out on the basis of experience in Germany and Austria. 8 Slovene water supply companies provided data for the analysis.

Among the 8 participating companies, none of them achieved the value of 100% cost-recovery rate. However, 3 companies almost achieved it (Figure 5). There are also companies, which are far from the value needed for cost-recovery (i.e. they have significant losses in the field of water supply). These companies will need to check the adequacy of their prices and adapt them in line with the requirements of the Water Framework Directive.

Figure 5: Cost recovery of public water supply in accordance to results of Twinning project (EU Twinning Project SI06/IB/EN/01, 2008)



3.1.4 Proposed steps and measures to improve cost recovery

In the Draft of Slovene River Basin Management Plan some measures are proposed to improve cost-recovery for water services. These measures are described below.

In spite of legal instruments, which ensure the cost-recovery for water services, it was established, that 100% cost-recovery is not completely achieved. Some activities that have impact on water status are not obliged to pay for the environmental and resource costs they are causing. To assess actual environmental and resource costs for all activities that are responsible for these costs further research activities and changes of legislation are foreseen.

Financial funds from wastewater charge, payment for water rights and water use fee should be entirely used for achieving water management objectives.

Since the data for cost-recovery rate assessment for financial costs of public water supply service and municipal wastewater collection and treatment are difficult to attain, it was recommended that public water supply service and municipal wastewater collection and treatment companies should report the necessary data to the Ministry of environment and spatial planning every year.

3.2 Croatia

There are two water services selected in Croatia, public water supply and public wastewater collection and treatment.

In Croatia, assessment of the cost recovery is very complex. Aggregation of revenue and expenditure on the river basin level is impeded by numerous interactions between water companies, local/regional authorities, central authority and Hrvatske Vode.

For provided services water companies yield revenues - in the form of water price. Structure of water price differs depending on water users – household and business sector.

To estimate expenditure, data on unit costs were available. Data were collected using survey of selected water companies in 2007. Data on unit costs include estimation of operation and maintenance costs only. Capital costs and external environmental costs, as well as water resource costs are not included in estimation. Therefore, estimation of total economic costs is not feasible.

On national level data show that rate of the recovery of operation and maintenance costs for both services (water supply and wastewater service) is satisfying. It should be stressed out that in assessment of the cost recovery real payment of provided services was not taken into account. In recession this could substantially influence financial flows.

Although these are preliminary and rough estimates it could be concluded that for both services (water supply and wastewater service) household sector is „subsidized“ by business sector. It actually means that financial burden is in bigger extent allocated to business sector. These results are expected while household water price is lower than in business sector.

Total rate of recovery costs could not be assessed (in addition to financial costs of water companies it includes other costs that are external to water companies). Estimated costs should be compared to total revenues but in Croatian case this process is not possible due to: complexity of financial interactions between different agents in the whole water system as well as the fact that charges collected by water companies, and which are revenues of Hrvatske Vode (i.e. water use charge and water protection charge)

internalize partially other costs (and not just financial). In this moment it is not clear which part of total economic cost is internalized by collecting these charges.

Assessment of total economic costs requires new researches. There is no need to perform such researches as often as researches related to financial costs, while environmental costs and water resource costs do not show significant fluctuations in the short-run (except in the case of severe changes in environmental quality).

In the near future there will be many important issues on research agenda. The most important are: full estimation of capital costs, estimation of external environmental costs, enhancing coordination and communication between different parties responsible for collection of data, etc.

It could be concluded that Croatian Government has already performed certain activities that would simplify research on cost recovery. First, there is expected reform in public utility sector², and second there are two new bylaws that will help in cost recovery assessment³.

Preliminary estimates should be taken with great concern while the main purpose of estimation of cost recovery is to help water authorities to formulate and implement optimal water policy.

3.3 Bosnia & Herzegovina – Zenica case study

Zenica is an industrial city and one of the largest cities and municipalities in Bosnia and Herzegovina. It is the capital of the Zenica-Doboj Canton of the Federation of BiH entity, and administrative, economic and industrial centre of the region. Zenica is located about 70 km north of Sarajevo and is situated on the Bosna River, surrounded by mountains and hills. Surface area of the municipality is 560 km² with 138 439 habitants. The whole municipality has a strong urban character: only 20% of population lives in surrounding rural areas and majority approximately 92, 000 live in the City of Zenica.

² Expected reform in public utility sector will improve collection and the quality of collected data. According to the provisions of Water Act (Official Gazette 153/09) public utility services of water supply and collection and treatment of waste water are transferred to the scope of the Water Act. If the provider of utility services performs other utility services (such as gas supply, disposal of municipal waste, retail market, etc.; it is the most regular case), the provider is obliged to harmonize his legal status and subject of operation, i.e. to exclude these utility services from its scope of work in a period of three years from the entry into force of Water Act (deadline is 1st January 2013).

³ Ordinance specifying criteria for economic performance of public water supply and public sewerage services (OG 112/2010) and Ordinance on the lowest basic price of water services and types of costs that should be included in water price (OG 112/2010).



The City of Zenica

The drinking water supply and wastewater system is operated by municipal utility company JP "Vodovod i kanalizacija" d.o.o. Zenica. Water supply system is well organized and provides a high level of services to the population of 90,000 inhabitants that are connected to the system. Sewerage network is also well developed with, for the BA conditions, a relatively high coverage ratio of 83% of population connected to the sewerage system. In total approximately 75,000 Zenica inhabitants are connected to the system. The system is a combined sewerage system and collected wastewaters are discharged without any treatment to the river Bosna at 10 locations. Length of the main collectors is 7.5 km and primary sewerage network approximately 75 km.

Water supply and sewerage service characteristics:

Drinking Water:

- Abstracted drinking water: 12, 580,000 m³
- Invoiced drinking water (2009): 6, 575,800 m³
 - Households (HH): 5,049,390 m³
 - Industry (IND): 1, 068,490 m³
 - Institutions (INS): 457.920 m³

Wastewater:

- WW collected and invoiced total: 8, 500, 000 m³
 - HH: 6 ,500,000 m³
 - IND: 2,000,000 m³
- WW treated total: 0 m³

The 2009 Financial Report of Waterworks contains the following information:

Revenues are planned and recorded by user groups as Households Industry and Institutions, as well as Drinking water division and Wastewater division. The annual

costs are also divided by these cost centers. Therefore only the company total can be presented as follows:

	Denomination	Amount in BAM
1	Sales revenue – DW HH	2, 019,282
2	Sales revenue – DW IND	1, 407,473
3	Sales revenues – WW HH	876, 043
4	Sales revenues – WW IND	581, 839
5	Revenue from development	-
6	Other revenue	100, 000
7	Total annual water service revenue: 7= 1+2+3+4+5	4, 884, 637
8	Annual Operational & Maintenance costs	4,225,224
	8.1 Out of it: water abstraction charge	1, 771, 876
	8.2 Out of it: penalty	447, 948
	8.3 Out of it: others	2, 005, 400
9	Annual Depreciation DW:	2, 030, 000
10	Annual Depreciation WW:	-
11	Cost recovery – operational: 7/8	116%
12	Cost recovery – Total company: 7/(8+9+10)	78%

Based on company's report the following per capita information are available for assessment of technical level of the service:

Drinking water:

Abstracted	383	l/person/day
Invoiced	200	l/person/day

Wastewater:

Collected and invoiced	310	l/person/day
Treated	0	l/person/day

Pricing policy – Fees

The price setting authority is the Municipality; price proposal is prepared for several years. The foreseen expenditures are calculated from approved fees. The tariffs for DW and WW are both of one-component fees, which depends exclusively on the volume of the provided water service.

The overall tariff level is low as compare to European: 0.1 EUR/m³ for WW, and 0.2 EUR/m³ for DW services for households. The industrial tariffs are double of HH's.

The fees for industry are significantly higher (2.5-4-fold) than those for households, this way the household tariffs probably are cross-subsidized by industry.

No tariff increases are carried out in period 2006-2009.

The average household spends 1.7% of its net income on water services, which is in European comparison considered not high.

Pricing policy – Payment discipline

The value of unpaid bills are high, the households have higher outstanding payment than industry. The share of unpaid bills above one year constitutes 10-15% of total outstanding.

Measures were taken for collection of outstanding bills, but those are insufficient. The main reason of unpaid bills is the unfavorable social situation of population. No support system for customers exists on the area of operation.

Ownership of assets – annual depreciation

The assets of service provider are owned by the Municipality.

Financial sources for annual reconstructions are not sufficient.

Proposed steps to improve cost-recovery level (by service provider):

There are no proposed any steps.

3.4 Serbia – Valjevo case study

Valjevo is situated in western Serbia less than 100 kilometers to the southwest from Belgrade. The downtown is situated in a depression through which the Kolubara River flows. Valjevo is among bigger and developed settlements in Serbia.

According to the 2002 census, the downtown has 61 035, and the entire city has 96 761 inhabitants. Valjevo has a favorable geographical position, which is featured by the vicinity of a number of important traffic routes, such as Ibarska highway and the railroad line Belgrade - Bar.



The main square of the City of Valjevo

The Kolubara River originates in Valjevo, where it is formed by the Jablanica and the Obnica Rivers. Within the territory of Valjevo, the Ljubostinja and the Gradac Rivers also join the Kolubara River.

Economy

Valjevo economy is characterized by the agriculture and processing industry, civil engineering, and graphic industry. The private sector is particularly developed, which consists of small and medium-sized enterprises and private workshops and retail stores. Within the economic sector, 1 039 enterprises operate in the city of Valjevo, out of them 7 big, 30 medium-sized, and 1 002 small ones. There are also 4 635 private entrepreneurs in the city, most of them dealing with retail trade (36.76%) and processing industry (18.73%). In the entrepreneurial structure, retail trade hold a dominant position, followed by the processing industry, transportation/hauling, warehousing, and communications (754), catering activities (426), and building industry (306).

Water supply and sewerage characteristics

In the territory of the city, there is a very important water source on which two big systems are based:

- Regional Kolubara system providing water of the highest quality, for water supply to the settlements and those industries that consume drinking water quality.
- Kolubara river system, providing water for technological requirements and irrigation, as well as protection of water quality.

Increasing demands of the city and its environs for drinking water have imposed, as a priority, construction of water factory in Pećina (PPV Pećina) where treatment of water from three sources is carried out:

- The Gradac River
- Spring Paklje
- Dam lakes Stubo-Rovni (dam under construction).

PUC Vodovod (Waterworks) - Valjevo is engaged in a very important activity in the water supply to the city and surrounding settlements, where the equipment and units keep abreast with the modern water treatment technology.

Water supply network

- A total of 26,879 apartments and households (coverage of 81%) and 1,090 entities are connected. Population supplied by drinking water (DW) is 61,000 persons.
- Abstracted drinking water: 10,417,000 m³
- Invoiced drinking water (2009): 4,996,000 m³
 - Households (HH): 3,947,000 m³
 - Industry (IND): 1,049,000 m³

Sewer network

- A total of 24, 321 apartments and households (coverage of 74%) and 926 entities are connected to the wastewater (WW) collection network.
- Sanitation:
 - WW collected, treated and invoiced total: 4 420 000 m³
 - HH: 2,859, 000 m³
 - IND: 1,561,000 m³
 - WW treated total: 6,411,000 m³

The 2009 Financial Report of Waterworks contains the following information:

Revenues are planned and recorded by user groups as Households and Industry, as well as Drinking water division and Wastewater division, but the annual costs are not divided by these cost centers. Therefore only the company total can be presented as follows:

	Denomination	Amount in RSD
1	Sales revenue – DW HH	94, 400, 000
2	Sales revenue – DW IND	51, 000, 000
3	Sales revenues – WW HH	40, 600, 000
4	Sales revenues – WW IND	39, 700, 000
5	Revenue from development	50, 600, 000
6	Other revenue	19, 326, 000
7	Total annual water service revenue: 7= 1+2+3+4+5	295, 626, 000
8	Annual Operational & Maintenance costs	352, 826, 000
9	Annual Depreciation:	73, 600, 000
10	Annual Depreciation:	41, 400, 000
11	Cost recovery – operational: 7/8	84%
12	Cost recovery – Total company: 7/(8+9+10)	63%

Based on company's report the following per capita information are available for assessment of technical level of the service:

Drinking water:

Abstracted	468	l/person/day
Invoiced	224	l/person/day

Wastewater:

Collected and treated	287	l/person/day
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Invoiced

188

l/person/day

Pricing policy – Fees

The price setting authority is the Municipality, price proposal is prepared annually. The tariffs for DW and WW are both of one-component fees, which depends exclusively on the volume of the provided water service.

The fees for industry are significantly higher (2-3-fold) than those for households, this way the household tariffs probably are cross-subsidized by industry.

Significant tariff increases are carried out year by year, the latest increase (in 2009) 20% as compare to the previous year.

The average household spends 1.3% of its net income on water services, which is in European comparison considered not high.

Pricing policy – Payment discipline

The value of unpaid bills are high, the industry has higher outstanding payment than households. The share of unpaid bills above one year constitutes 70-80 % of total outstanding.

Measures were taken for collection of outstanding bills, but those are insufficient as the remaining – increasing – unpaid amount shows.

Ownership of assets – annual depreciation

The assets of service provider are owned by the State. The ratio of Net and Gross asset value is ~50% in both division.

There are fully depreciated but still operating assets (~ 10 years) in both divisions: DW distribution network, DW treatment plant and WW treatment plant. Book value of assets is significantly lower than their market value. This indicator for sanitation is assessed 22% and drinking water supply 78%.

Comparing needs for annual re-investment to the financing sources the picture shows great lack of resources: about 50-60 % of required re-investment can be financed, smaller part of depreciation recovered in tariffs, larger part by subsidies or bank loans.

Proposed steps to improve cost-recovery level:**Technical reconstruction:**

Source for improvement of cost recovery is technical reconstruction, which converges the per capita abstracted and invoiced drinking water, and collected, treated and invoiced wastewater, due to elimination of losses.

Tariff increase:

There is a need for tariff increase in order to fully cover the O&M costs and an increasing share of depreciation.

By expert judgment the unit fee providing satisfactory cost-recovery level is 1.3-1.5 €/m³.

The unfavorable social situation (unemployment, low net income) does not allow the necessary fee increase. Affordability level of tariff is to be considered.

3.5 Montenegro

Exceptionally limited information is available on particular waterworks of Montenegro. The following case study is an extract from a study prepared by international consultants on cost-recovery issue for Montenegro. The figures below are describing the operation of waterworks which are situated on the Sava River Basin part of Montenegro.

The Waterworks provide water supply and sanitation activity for the cities and surrounding settlements of the Sava River Basin part of Montenegro.

Water supply service

- Population supplied by drinking water (DW) is 64,315 persons.
- Abstracted drinking water: 20,553,000 m³
- Invoiced drinking water (2009): 10,735,000 m³
 - Households (HH): 6,692,00 m³
 - Industry (IND): 2,634,000 m³
 - Institutions (IND): 1,409,000 m³

Sanitation service

- WW collected and invoiced total: 6,000,000 m³
- WW treated total: 70,000 m³

The 2009 Financial Report of Waterworks contains the following information:

Drinking water service:

Abstracted **422** l/person/day

Invoiced **285** l/person/day

Pricing policy – Fees

The price setting authority is the Municipality; price is multiannual, approved for several years. The tariffs for DW and WW are both of one-component fees, which depends exclusively on the volume of the provided water service.

Denomination	2006	2007	2008	2009
Drinking water services [€] (excl. VAT)				
Base fee				none
Unit fee for households				0.31
Unit fee for industry				1.08
Unit fee for institutions				
Unit fee for agriculture				0.00

Denomination	2006	2007	2008	2009
Drinking water services [€] (excl. VAT)				
Subsidy from state budget				0.00
Subsidy from municipal budget				0.00
Sanitation services [€] (excl. VAT)				
Base fee				none
Unit fee for households				0.16
Unit fee for industry				0.54
Unit fee for institutions				
Subsidy from state budget				0.00
Subsidy from municipal budget				0.00
Environmental fees paid by customers				0.00

The fees for industry are significantly higher (2-3-fold) than those for households, this way the household tariffs probably are cross-subsidized by industry.

The prices cover operation & maintenance costs. The source of investment and renewal of infrastructure is the Municipal budget.

4 Case studies on Payments for Ecosystem Services

The benefits that people get from nature are known as ecosystem services.

Over the last fifty years various instruments have been used to address the market failures behind the collapse of ecosystem services – taxes, subsidies, user-charges, access-fees, penalties. More recently, Payments for Ecosystem Services (PES) schemes have been developed to address market failures where ecosystem services are ‘public goods’ or ecosystem services lie outside of normal market transactions⁴.

Four main ecosystem services are being covered by PES schemes around the world today:

- watershed services
- carbon sequestration
- landscape beauty
- biodiversity conservation

For PES schemes to be implemented effectively, it’s important to:

- create mechanisms for valuing (or at least measuring) services that are not currently valued by markets
- identify how additional amounts of these services can be provided in a more cost-effective way
- decide which farmers to compensate for providing more of these services
- determine how much to pay them

Many existing PES schemes do not satisfy these conditions. Among the most common shortcomings are:

- they fail to yield positive social benefits
- they fail to identify and pay for additional measures (instead they pay for the adoption of practices that would have been adopted anyway)
- they allow leakage, meaning that environmental damage is indirectly done to other areas
- they fail to generate the resources required to maintain incentives to service providers

In principle, it should be possible to estimate the marginal benefit of the introduction of a PES scheme, known as the measure of the ecosystem output (what the scheme is supposed to produce). In practice, however, since most PES schemes focus on incentives to change land use rather than incentives to change ecosystem service output, there are few effective measures of output. In the absence of satisfactory measures of output, the

⁴ Rodrigo Arriagada and Charles Perrings, Making Payments for Ecosystem Services Work, UNEP, August 2009

only way to evaluate the potential efficiency of a PES scheme is to look at how the scheme works, basically its design and process.

4.1 Watershed services - an example

Healthy forests and wetland systems provide a host of watershed services, including water purification, ground water and surface flow regulation, erosion control, and stream bank stabilization. The importance of these watershed services will only increase as water quality becomes a critical issue around the globe. Their financial value becomes particularly apparent when the costs of protecting an ecosystem for improved water quality are compared with investments in new or improved infrastructure, such as purification plants and flood control structures – in many cases it is often cheaper and more efficient to invest in ecosystem management and protection.

Innovative market-based mechanisms for watershed services include self-organized private payments, public payments or incentives, and trading schemes.

4.2 Role of the WWF

Nowadays WWF is leading the way in developing PES schemes around the world. In the case of Europe, recent and ongoing changes (e.g. Water Framework Directive, Common Agricultural Policy, Rural and Regional development policy, the Eastern enlargement of the EU as well as the European Neighbourhood Programme) have opened a window of opportunity to mainstream PES as a major conservation tool.

At WWF Danube-Carpathian Programme we have been developing a number of practical initiatives, including a major project in the Danube Basin.

In 2006 -2007, WWF Danube-Carpathian Programme worked with the Institute of European Environmental Policy and country partners on an EU-supported project to investigate the potential for innovative funding sources such as payments for environmental services for nature conservation in Croatia within the Sava River Basin.

The Croatian project can serve as a case study for other Sava RB countries on implementing PES.

5 References

The main references for this background paper are the Draft River Basin Management Plans for Danube River Basin and North Adriatic River Basin with all contained references (MOP RS, IzVRS, ARSO, GeoZS (2011)).

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IREET (2008). Pregled in analiza stanja na področju oskrbe s pitno vodo, 1. delovno poročilo v okviru projektne naloge Izdelava metodologije za oblikovanje in spremljanje cen komunalnih storitev. Inštitut za raziskave v energetiki, ekologiji in tehnologiji, d.o.o., Ljubljana, april 2008.

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MOP RS. (2009). Operational programme for the discharge and treatment of urban waste water for the period 2005-2017 (Operativni program odvajanja in čiščenja komunalne odpadne vode za obdobje od leta 2005 do leta 2017). Republika Slovenija, Ministrstvo za okolje in prostor

Annex 1

Questionnaire

on cost recovery and incentive pricing

Important:

- a) Please fill in the **empty cells in white** in **all** following tables
- b) All information should be related to fiscal **year 2009**

Name of your country:			
Local currency:			
Exchange rate as per 1 January 2010 (by National Bank):	1 EUR =		Local currency

5.1 General information on service provider

5.1.1 Name and address of service provider

Name	
Address	

5.1.2 Quantity of abstracted drinking water (DW)

Abstracted DW		thousand m ³ /year
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5.1.3 Quantity of invoiced drinking water (in thousand m³/year)

If such distinction exists, otherwise fill in only Total

Households	Industry	Institutions	Agriculture	Total

5.1.4 Population supplied with drinking water

Population		persons
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5.1.5 Specific drinking water consumption abstracted and invoiced

Abstracted		l/person/day
Invoiced		l/person/day

5.1.6 Quantity of collected wastewater

If such distinction exists, otherwise fill in only Total

Households	Industry	Institutions	Total

5.1.7 Quantity of collected wastewater invoiced (in thousand m³/year)

If such distinction exists

Households	Industry	Institutions	Total

5.1.8 Quantity of treated wastewater

If such distinction exists, otherwise fill in only Total

Households	Industry	Institutions	Total

5.1.9 Quantity of treated wastewater invoiced (in thousand m³/year)

If such distinction exists

Households	Industry	Institutions	Total

5.1.10 Specific wastewater quantity invoiced

Collected		l/person/day
Treated		l/person/day

5.2 Financial viability of drinking water supply and sanitation⁵, tariffs and unpaid bills**5.2.1** Do you prepare annual cost-calculations and financial reporting separately for divisions of drinking water and sanitation?

☐ Yes ☐ No

5.2.1.1 If the answer is 'Yes', which management level the cost-calculation is prepared for?

Pls **check** suitable answer (**more than one answer** can be selected)

Management level of cost-calculation	Pls check if yes
Divisions	☐
Settlement	☐

⁵ **Sanitation** includes both wastewater collection and wastewater treatment services

Management level of cost-calculation		Pls check if yes
Whole service area		☐
Other, namely:		☐

5.2.1.2 In case the annual cost-calculation is prepared for divisions, pls indicate the following data

Costs and revenues of water supply and sanitation (in local currency)		
Name	Drinking water	Sanitation
1. Total annual costs of services		
1.1 out of it: Depreciation		
1.2 out of it: Rent and/or leasing costs		
1.3 out of it: Water abstraction charge		
1.4 out of it: Administration costs		
2. Other expenses		
2.1 out of it: Penalty/fine for pollution		
2.2 out of it: Environmental charges		
3. Total annual operational expenditures (1+2)		
4. Net sales revenue		
4.1 Revenue from households		
4.2 Revenue from industry		
4.3 Revenue from institutions		
4.4 Revenue from agriculture		
4.5 Environmental charges devolved to users		
5. Subsidies to service costs from:		
6. Other revenues		
7. Operational revenues (4+5+6)		
8. Result of operation (7-3) cost-recovery 1:		

5.2.1.3 If the answer is 'No' for question 2.1 (financial reporting is not prepared separately for each division), please indicate the following data

In the table below new row(s) can be inserted, as necessary

Name		local currency
1. Costs		
1.1	Operation & Maintenance	
1.2	Depreciation	
1.3	Water abstractions and/or environmental fines	
2. Revenues		
2.1	Fee revenues	
2.1	Environmental charges from users	
Subsidy, from:		
3. Result of operation (2-1) cost-recovery 1:		

5.2.2 Presentation of unit fees of the services in the last 4 years

Are these fees different by settlements?

☐ Yes ☐ No

5.2.2.1 What is the basis for fee calculation?

Pls **select** the most suitable answer (**only one answer** can be selected)

Basis for fee calculation		Pls check if yes
Consumed quantity [in local currency/m ³]		☐
Area of dwellings [in local currency/m ²]		☐
Value of dwellings [in local currency]		☐
Other, specify:		☐

5.2.2.2 Components of fees for drinking water and sanitation services

Name	2006	2007	2008	2009
Drinking water services [in local currency] (excl. VAT)				
Base fee				
Unit fee for households				
Unit fee for industry				
Unit fee for institutions				
Unit fee for agriculture				
Subsidy from state budget				
Subsidy from municipal budget				
Sanitation services [in local currency] (excl. VAT)				
Base fee				
Unit fee for households				
Unit fee for industry				
Unit fee for institutions				
Subsidy from state budget				
Subsidy from municipal budget				
Environmental fees paid by customers				

5.2.3 Distinction between customers

5.2.3.1 Is there any distinction between drinking water customers?

☐ Yes ☐ No

If the answer is 'Yes', what is the criteria of distinction?

(Only one answer can be selected)

Base of distinction		Drinking water
Type (households, industry, institutions, etc.)		☐
Quantity		☐
Other, specify:		☐

5.2.3.2 Is there any distinction between sanitation customers?

☐ Yes ☐ No

If the answer is 'Yes', what is the criteria of distinction?

(Only one answer can be selected)

Criteria of distinction		Drinking water
Type (households, industry, institutions, etc.)		☐
Pollution		☐
Other, specify:		☐

5.2.4 Procedure of fee approval, price-setting authority, problems**5.2.4.1 Which one is the price-setting authority?**

(Only one answer can be selected)

Basis of distinction		Water services
Municipality of the operation area		☐
Association of municipalities of the operation area		☐
Independent price-setting authority		☐
Other, specify:		☐

5.2.4.2 Please characterize the price approval by one of the followings

(Only one answer can be selected)

Basis of distinction		Water services
Defined fee covers total operational expenditures		☐
Foreseen expenditures are calculated from approved fees		☐

5.2.4.3 Which statement is correct on your area?

Pls **check** suitable answer (more than one answer can be selected)

Price-setting practice	Pls check if yes
Price proposal is prepared annually	☐
Price proposal is approved for next several years	☐
In price proposal the expectations of the price-setting authority are already considered as one of the following (only one answer can be selected)	

Price-setting practice		Pls check if yes
▫ fees to be increased only by annual inflation rate or less		☐
▫ necessary investment costs are not planned to be covered at all		☐
▫ fee increase is not proposed, because it is assumed to be rejected anyway		☐
▫ other, namely:		☐

5.2.4.4 Description of price-setting practice, problems and recommendations

Pls give **narrative** explanation

--

5.2.5 In your opinion what percentage of fee-increase would recover the necessary, but currently unrecovered costs?

Name	Share of currently unrecovered costs vs. total annual accounted costs [%]
Drinking water	
Operation of drinking water supply	
Maintenance of drinking water supply	
Drinking water supply total:	
Sanitation	
Operation of sanitation service	
Maintenance of sanitation service	
Sanitation service total:	

5.2.6 Unpaid bills

Name	Households	Industry	Institutions	Agriculture
Unpaid bills total [local currency]				
Unpaid bills total over 90 days [local currency]				

Unpaid bills as compare to annual revenues from services in %

	0 – 90 days	90 – 180 days	180 – 360 days	Over 1 year	Total
Households					
Industry					
Institutions					
Agriculture					
Total					

5.2.7 Price affordability problems

5.2.7.1 Do you observe price affordability problem at households?

☐ Yes ☐ No

If the answer is 'Yes', what is the reason?

(more than one answer can be selected)

Reasons	Pls check
Unfavourable social situation	☐
Low household income	☐

Reasons		Pls check
High prices		☐
Lack of subsidy		☐
Undisciplined customer		☐
Lack of sanctions		☐
Other, specify:		☐

5.2.7.2 Do you observe price affordability problem at other customers?

☐ Yes ☐ No

If the answer is 'Yes', what is the reason?

Pls give **narrative** explanation

5.2.8 Did you take measures for collection of outstanding bills?

☐ No because it is illegitimate
☐ Yes we applied the following measures:

(**more than one answer** can be selected)

Pls check	Measures applied	If selected, customers share in	
		number	%
☐	Customers excluded from services		
☐	Customers restricted in service		
☐	Other, namely:		

5.2.9 Does a support-(subsidy) system for customers in your area of operation exist?

☐ Yes ☐ No

If the answer is 'Yes', which one of the following statements is correct?

(**only one answer** can be selected)

If selected, pls describe shortly the system

Pls check	Support system	Description of support system
☐	Support to reside	
☐	Debt support:	
☐	Support from an endowment (foundation)	

Pls check	Support system		Description of support system
☐	Aid, namely:		
☐	Other, namely:		

5.2.10 What amount is the average per capita household income in your service area?

Income		local currency/capita	estimated ⁶	☐
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5.3 Ownership of fixed assets and condition of operational assets

5.3.1 In which year the last evaluation of water services assets took place, if any?

	Year of evaluation
Drinking water supply	
Sanitation services	

5.3.2 Distribution of registered capital of the operator

Owner	Value of share capital [local currency]	Share [%]	Number of owners
Municipality			
State			
Private			
Other			
Total		100%	

5.3.3 Book value of the water services assets (without the value of land) as per 31 December 2009.

In case there is no book value, or the municipality cannot provide it, pls give estimation in local currency

	Property			Esti- mated
	Own	Municipality	Rented from state	
c) Asset value of drinking water production and treatment				
▫ Gross asset value				☐
▫ Net asset value				☐
d) Asset value of drinking water network				

⁶ In case the official data is missing

	Property			Estimated
	Own	Municipality	Rented from state	
▫ Gross asset value				☐
▫ Net asset value				☐
e) Asset value of drinking water division: a) + b)				
▫ Gross asset value				☐
▫ Net asset value				☐
f) Asset value of wastewater treatment				
▫ Gross asset value				☐
▫ Net asset value				☐
g) Asset value of wastewater collection network				
▫ Gross asset value				☐
▫ Net asset value				☐
h) Asset value of sanitation division: d) + e)				
▫ Gross asset value				☐
▫ Net asset value				☐

5.3.4 Fully depreciated, but still operating assets at the service provider

	Gross value of assets fully depreciated in accounts	Number of years of operation after fully depreciated
Drinking water		
▫ Distribution network		
▫ Water production and treatment		
Sanitation		
▫ Collection network		
▫ Treatment		

5.3.5 How many percent of total market value the current accounted value of assets represent?

Please give estimation

Book value of assets / Market value of assets	Drinking water	Sanitation
[local currency]	[%]	[%]

5.4 Needs for re-investment, reconstruction

5.4.1 Do you have an annual plan for reconstruction, based on technical necessity?

☐ Yes ☐ No ☐ Partially

If the answer is '**Partially**', Please explain

--

5.4.2 Do you have an annual plan for reconstruction, based on available financial sources?

☐ Yes ☐ No ☐ Partially

If the answer is '**Partially**', Please explain

--

5.4.3 Calculation of needs for re-investment

5.4.3.1 In the table below please give an estimation of value for *outstanding re-investment costs, based on technical aging and urgency of reconstruction measures for each division of water services* (a)

5.4.3.2 In the table below please give an estimation of value for *future re-investment costs (over the value of outstanding re-investment)* (b)

5.4.3.3 In the table below please give an estimation of value for *annual unforeseen re-investment costs* (c)

Re-investment costs	Planned to be carried out	
	between 2011 – 2015	after 2015
	[local currency]	
a) Value of outstanding re-investment costs		
▫ Drinking water		
▫ Sanitation		
b) Value of future re-investment costs		
▫ Drinking water		
▫ Sanitation		
c) Value of annual unforeseen re-investment costs		
▫ Drinking water		
▫ Sanitation		
d) Annual average re-investment costs (a+b+c)		
▫ Drinking water		
▫ Sanitation		

5.5 Financial sources for re-investment, reconstruction

5.5.1 Annual financial sources for realized reconstruction in currency and %

Drinking water and Sanitation	Deprecia- tion	Leasing fee	Profit	Other:	Total
	[local currency]				
Own sources					
Sources of the Municipality					
Sources of the State					
Total re-investment					

Drinking water and Sanitation	Deprecia- tion	Leasing fee	Profit	Other:	Total
	[%]				
Own sources					100%
Sources of the Municipality					100%
Sources of the State					100%

5.5.2 Necessary reconstructions to be carried out in different periods of time (The planned necessary reconstructions pls take from point 5.4.3 above)

	2009	2010	Between 2011 - 2015	After 2015
Drinking water				
a) Financial sources				
b) Necessary reconstruction				
Financed re-investment (a/b in %) cost-recovery 2				
	2009	2010	Between 2011 - 2015	After 2015
Sanitation				
a) Financial sources				
b) Necessary reconstruction				

	2009	2010	Between 2011 - 2015	After 2015
Financed re-investment (a/b in %) cost-recovery 2				

5.5.3 Re-investment carried out for own assets

5.5.3.1 Are the available financial sources for the necessary reconstruction sufficient?

☐ Yes ☐ No

5.5.3.2 Does the legally available *depreciation* cover the re-investment, and which part of the re-investment in the indicated period?

	2009	2010	Between 2011 - 2015	After 2015
Drinking water				
a) Depreciation				
b) Necessary reconstruction				
Financed re-investment (a/b in %) cost-recovery 2				

	2009	2010	Between 2011 - 2015	After 2015
Sanitation				
a) Depreciation				
b) Necessary reconstruction				
Financed re-investment (a/b in %) cost-recovery 2				

5.6 Proposed steps and measures to improve cost-recovery level

Please give narrative explanation for each

1. Measures to improve cost-recovery 1 (recovery of O&M costs)

2. Measures to improve cost-recovery 2 (recovery of re-investment costs)

3. Other steps and measures