BLUEWATERS

Environmental Consultants

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Draft Report: SUSTAINABLE SOLUTIONS TO IMPROVE THE QUALITY OF DRINKING WATER AFFECTED BY HIGH ARSENIC CONTENTS IN 3 VOJVODINIAN REGIONS

BOOK 5: Ownership and Finance

City of Vienna MA 31

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3. Water supply survey in Vojvodina, including geographical maps, Jaroslav Cerni, Institute for Development of Water Resources, Belgrade, May 2004
4. Chemical analysis (Arsenic) of the drinking water for the following cities: Subotica, Odzaci, Karavukovo, Bogojevo, Ratkovo, Lalic, Zrenjanin, Aradac, Klek, ;elenci, Elemir, Taros, Mihajlovo, Jankov Most, Temerin, Sirig, Backi Jarak, Nadalj; Dr. Bozidar Petrovic, Institut for Sanitary Surveyor in AP Vojvodina, Novi sad, January 2004
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vi. List of Abbreviations

BMLUFW	Federal Ministry of Agriculture and Forestry Environment and Water Management
BOT	Build Operate Transfer
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
ERM	Environmental Resource Management
IFI	International Financing Institute
O&M	Operation and Maintenance
PM	Project Management

PPP	Private Public Partnership
PSP	Private Sector Participation
SPC	Special Purpose Company
UNIDO	United Nations Industrial Development Organization
VG	Vojvodinian Government
WB	World Bank
WHO	World Health Organization
WTF	Water Treatment Facility

5 OWNERSHIP AND FINANCE

5.1 Introduction

The Vojvodinian drinking water supply pre-feasibility study (the Study) is based on the idea that a joint programme of the Vojvodinian Provincial Secretariat for Environment and Sustainable Development (Vojvodinian PSESD) and City of Vienna, Department of Water Management (MA 31) aimed at the integration and improvement of drinking water access and distribution in Vojvodina. BLUEWATERS, Environmental Consultants (BLUEWATERS) were assigned by MA 31 to conduct the pre-feasibility study in order to develop a best technical solution scenario and additionally present a financial sensitivity analysis and socioeconomic drivers and constrains of water service and users aggregation.

5.2 Financial feasibility

5.2.1 Methodological Aspects

- Out of the three network variants of systems in terms of sourcing, treatment and distribution, as described in the technical analysis, the **variant "Macro"** is assessed in this financial evaluation.
- In terms of demand parameters the analysis draws information from an extensive survey of communities in the project area. A pool of data on water supply was assembled in terms of population, physical characteristics, systems, water sources and consumption, water quality, pricing, costs, legal and institutional conditions.
- The methodology and terminology used correspond principally to a proven bankable format applied with international financing institutions as well as with funding facilities based with the European Commission.
- The key indicators of the dynamic profitability analysis in a financial setting are the Internal Rate of Return (IRR) and the Net Present Value (NPV). They are calculated on the basis of total investment for all system components, i.e. without the consideration of the financing structure, thus the performance of the project proper is evaluated.

- With regard to the financing structure, equity is quoted without definition of individual sponsors (consideration of PSP) of the special purpose company. A loan from an international financing source has been assumed. The effects of the financing structure are demonstrated in the financial statements, i.e. the projection of Net Income Statements, of Projected Balance Sheets and of Cash Flow Tables for financial planning.
- The period of project preparation and construction is assumed to last from 2007 until of 2011. During this period a gradual build-up of operational activity is forecast, which determines the development of revenues and operating costs for the SPC. The project horizon has been chosen for 15 operational years. The operational life of the system is assumed to be 30 years, whereby technological changes can not be foreseen.
- Operating costs and revenues have been subjected to projected inflation patterns, thus rendering the analysis to be in current terms. Liquidity and the capacity for debt service coverage are thus determined under the conditions of substantial price changes persisting in Serbia.
- In order to test the possible effects from deviations of assumed key parameters a Sensitivity Analysis was carried out. Critical parameters tested are investment costs, operating costs and tariffs.

5.2.2 Projection of Demand

The relations in terms of demand for water in the project area is based on the results of the survey, which was carried out in a large number of communities in the project area. A summary of the responses received is provided in Table 5.1.

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	Population	Households	Connected	Share connected	Cons. M³/day			Consumption m³ Total		
	2005	2005			Households	Admin.	Commercial	Households	Admin.	Commercial
Sonta	5,300	1,985	1,882	95%	700	6	45	255,500	2,008	16,243
Kruscic	2,328	872	693	79%	510	15	50	186,150	5,475	18,250
Ruski Krstur	5,500	2,202	2,150	98%	498			181,770	0	0
Sivac	9,460	3,543	3,007	85%	1,035		22	377,775	0	8,030
Odzaci	10,000	3,745	2,050	55%	1,090	85	167	397,850	31,025	60,955
Backi Gracac	2,940	1,101	900	82%	450			164,250	0	0
Deronje	2,850	1,067	805	75%	500	5	16	182,500	1,825	5,840
Ratkovo	4,100	1,536	1,308	85%	400	20	80	146,000	7,300	29,200
Srpski Miletic	3,630	1,360	1,100	81%	368			134,263	0	0
Sombor	51,471	19,278	10,507	55%	8,573	470	2,701	3,129,145	171,550	985,865
Doroslovo	1,847	801	753	94%	247	27	32	90,155	9,855	11,680
Aleksa Santic	2,247	841	780	93%	261			95,204	0	0
Backi Breg	1,388	520	520	100%	120	2		43,800	730	0
Backi Bonostor	3,920	1,468	1,316	90%	305	2	23	111,325	730	8,395
Bezdan	5,700	2,135	1,780	83%	500	7	53	182,500	2,555	19,345
Kolut	1,700	637	570	90%	138			50,370	0	0
Ridjica	2,569	962	906	94%	453	1	5	165,345	365	1,825
Svetozar Miletic	3,263	1,222	1,221	100%	291	190		106,215	69,350	0
Telecka	2,119	895	850	95%	8		13	2,920	0	4,563
Total Project Area	122,332	46,170	33,098	72%	16,447	830	3,206	6,003,037	302,768	1,170,190

Table 5.1 Summary of Basedata.

From these base data the key indicators of water demand are drawn:

- The average number of persons per household is 2.65.
- The average share of households connected is 72%.
- The average per capita consumption of water per day in residential housing is 188 litres.
- The average consumption for public and administrative users is approximately 5% of the residential housing consumption.
- The average consumption in the project area for commercial users (industry, tourism, farms) is 19% of the residential housing consumption.
- Unaccounted for water, in particular losses in systems are assumed at 20% initially, with a decreasing pattern over the medium term.

The average growth of population in the West Backa between 1991 and 2002, i.e. up to the most recent census taken, was 0,12% per year. This growth rate is kept throughout the whole projection period. The impact of declining fertility rates and increasing life expectancy in Europe on the one hand, but also of migration developments on the other hand are therefore not considered.

In terms of consumption intensity no changes have been assumed with the water consumption of residential housing and public and administrative users. The sole determinant of consumption changes with residential housing is thus the very slight population growth.

For the consumption development with commercial users, the forecast economic development over the medium term has been considered. A medium term projection of GDP of the International Monetary Fund (IMF) is available from the publications related to its Article IV consultations with Serbia. This forecast of economic growth is considered as a determinant of water consumption of commercial users for the period 2006 through 2008. Thereafter an average increase of 1.0% is applied throughout the projection period.

Table 5.2 presents the projected water consumption for the “Macro”-Variant for the first ten years.

Item	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Water										
Population growth	*0,12%*	*0,12%*	*0,12%*	*0,12%*	*0,12%*	*0,12%*	*0,12%*	*0,12%*	*0,12%*	*0,12%*
Population in project area	354.539	354.976	355.413	355.851	356.290	356.729	357.169	357.609	358.050	358.491
Number of Households	133.808	133.973	134.139	134.304	134.469	134.635	134.801	134.967	135.134	135.300
Share of Households connected	*72%*	*72%*	*72%*	*72%*	*72%*	*72%*	*72%*	*72%*	*72%*	*72%*
Number of connected households	95.924	96.042	96.160	96.279	96.398	96.516	96.635	96.755	96.874	96.993
Persons connected	254.160	254.473	254.787	255.101	255.415	255.730	256.045	256.361	256.677	256.993
Persons per household	2,65	2,65	2,65	2,65	2,65	2,65	2,65	2,65	2,65	2,65
Consumption per person	188	188	188	188	188	188	188	188	188	188
Annual Water demand - in 1,000 m³										
Residents	17.398	17.419	17.441	17.462	17.484	17.505	17.527	17.549	17.570	17.592
Administration - total	875	875	875	875	875	875	875	875	875	875
Consumption change - Commercial	*5,0%*	*5,0%*	*1,0%*	*1,0%*	*1,0%*	*1,0%*	*1,0%*	*1,0%*	*1,0%*	*0,0%*
Commercial - total	3.716	3.901	3.940	3.980	4.020	4.060	4.100	4.141	4.183	4.183
Unaccounted for water	*20%*	*19%*	*17%*	*16%*	*14%*	*14%*	*14%*	*14%*	*14%*	*14%*
Water losses or not invoiced	4.398	4.106	3.784	3.459	3.133	3.142	3.150	3.159	3.168	3.171
Total water to be supplied	**26.387**	**26.302**	**26.040**	**25.777**	**25.512**	**25.582**	**25.653**	**25.724**	**25.796**	**25.821**

Table 5.2 Projection of demand in the project area – Variant „Macro“.

The overall volumes reach a temporary minimum in year 2011 due to the assumed gradual reduction of losses.

5.2.3 Tariff Development, Revenues and Affordability

The revenue base for the SPC is derived from Network Utilisation Charges (NUC) levied from the municipalities participating in the water association. The NUC is charged on a per m³ basis. The main criteria for the development of a tariff structure and its development are:

- A cost coverage allowing the SPC to fulfil its financial commitments, thus establishing self-financing conditions
- An observance of the "user-pays" principle through a harmonization of tariffs for all user categories
- A sensible policy toward the pricing of water, in particular for households, considering the limitations of Affordability

The proposed Network Utilisation Charges (NUC) are additional to municipal water fees for households. Thus the water fees of municipalities must be measured to leave total water expenditures per household below the affordability level assumed at 5%[1] for water an wastewater.

A unified rate is assumed for the NUC. It will be charged to a gradually increasing number of municipalities in the project area following the progress of works in connecting communities to the distribution system.

For the purpose of this analysis an initial NUC rate on a **2005 cost basis** was assumed as

30 Dinars per m³ corresponding to 0.36 EUR

The operational activity is forecast to gradually increase following the advances in implementation of the technical facilities. This build-up of operational activity is estimated at the following pattern:

[1] EBRD Working Paper No. 92, May 2005

Item	2007	2008	2009	2010	2011	2012
Rate of system operation	0%	0%	50%	75%	90%	100%

Table 5.3 Pattern of Operational Build-up

The collection rates with water tariffs, according to the survey, are presently at averages of 61% with households and at 65% with other users. The customers of the SPC are the municipalities organised in the Water Association. Therefore this organisation is the sole customer of the SPC. The charged NUCs are thus assumed to be collected at a rate of 100%. For the overall organisation of the SPC a guarantee in this respect would be very beneficial, in particular if private sector participation is sought. The development of revenues is shown in Table 5.4 for the first ten years of the project.

Affordability rates are calculated based on the Average annual available and spent resources of households in 2002, as published in the Statistical Yearbook of Serbia and Montenegro 2004. This value is increased at the growth rate of nominal wages.

Item	Unit	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Volumes supplied											
Volume - Residents	1.000 m³ p.a.	0	0	8.720	13.097	15.735	17.505	17.527	17.549	17.570	17.592
Volume - Administration	1.000 m³ p.a.	0	0	438	656	788	875	875	875	875	875
Volume - Commercial	1.000 m³ p.a.	0	0	1.970	2.985	3.618	4.060	4.100	4.141	4.183	4.183
Tariffs											
Residents	EUR/m³	0,59	0,65	0,88	0,93	0,93	1,02	1,02	1,05	1,08	1,12
Administration	EUR/m³	0,59	0,65	0,88	0,93	0,93	1,02	1,02	1,05	1,08	1,12
Commercial	EUR/m³	0,59	0,65	0,88	0,93	0,93	1,02	1,02	1,05	1,08	1,12
Growth profile		*25,0%*	*10,0%*	*35,0%*	*5,0%*	*0,0%*	*10,0%*	*0,0%*	*3,1%*	*3,1%*	*3,1%*
Revenues											
Residents	1.000 EUR p.a.	0	0	7.690	12.126	14.570	17.829	17.851	18.427	19.022	19.636
Administration	1.000 EUR p.a.	0	0	386	608	729	892	892	919	948	977
Commercial	1.000 EUR p.a.	0	0	1.737	2.764	3.350	4.135	4.176	4.349	4.528	4.669
Total Revenues		0	0	9.813	15.498	18.649	22.856	22.919	23.695	24.498	25.282

Table 5.4 Revenue Development – Variant „Macro“.

Item	Unit	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Average household income	EUR/p.m.	390	418	444	470	497	512	528	544	561	579
Monthly water consumption per HH	m³/p.m.	15,11	15,11	15,11	15,11	15,11	15,11	15,11	15,11	15,11	15,11
Average water bill	EUR/p.m./HH	9,0	9,9	13,3	14,0	14,0	15,4	15,4	15,9	16,4	16,9
Water expenditures (%)		2,3%	2,4%	3,0%	3,0%	2,8%	3,0%	2,9%	2,9%	2,9%	2,9%

Table 5.5 Projection of Affordability in the Project Area – Variant „Macro“.

5.2.3.1 *Investment Costs*

The components of the project variant "Macro" include the water supply wells and piezometers, water mains, access roads, fences and electrical works for the water sources in Budzak and Livade. With the treatment facilities the immediate water treatment installations (aeration, sand filtration, ozon, GAU-filtration, arsen removal and disinfection) as well as the electrical works are included. As for the investment cost of the distribution system all regional pipe lines, the required reservoirs and pumping stations are considered for the cost of this component. The acquisition of land has been considered with all processing facilities.

	Budzak	Livade	Distribution	Treatment	Total
Civil works	3,875,000	5,927,500	7,470,000	4,475,000	21,747,500
Equipment	1,552,500	1,284,000	10,000,000	3,247,500	16,084,000
Pipes			113,390,000		113,390,000
Land	250,000	250,000		150,000	650,000
Engineering and project preparation		0		3,000,000	3,000,000
Total	5,677,500	7,461,500	130,860,000	10,872,500	154,871,500

Table 5.6 Summary of Investment Costs – Variant „Macro".

In terms of depreciation, the various components of the investment have been considered according to the following rates prevalent in Serbia:

Civil works	1.5%
Pipes	5%
Machinery (Pumps, etc.)	8%

The cost of project engineering and preparation have been treated as incorporated fixed assets and depreciated at the rate applied for machinery.

Table 5.7 presents the scheduling of the investment budget during the implementation of the project.

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Item	TOTAL	2007	2008	2009	2010	2011
Civil works						
Groundwater source						
Budzak	3.875.000	1.162.500	1.162.500	1.162.500	387.500	0
Mesarske Livade	5.927.500	1.778.250	1.778.250	1.778.250	592.750	0
Treatment and distribution						
Treatment plant	4.475.000	1.342.500	1.342.500	1.342.500	447.500	0
Regional distribution - Reservoirs	7.470.000	1.494.000	1.494.000	1.494.000	1.494.000	1.494.000
Total civil works	21.747.500	5.777.250	5.777.250	5.777.250	2.921.750	1.494.000
Equipment						
Groundwater source						
Budzak	1.552.500	465.750	465.750	465.750	155.250	0
Mesarske Livade	1.284.000	385.200	385.200	385.200	128.400	0
Treatment and distribution						
Treatment plant	3.247.500	974.250	974.250	974.250	324.750	0
Regional distribution - Pump stations	10.000.000	2.000.000	2.000.000	2.000.000	2.000.000	2.000.000
Regional distribution - Pipes	113.390.000	22.678.000	22.678.000	22.678.000	22.678.000	22.678.000
Total equipment	129.474.000	26.503.200	26.503.200	26.503.200	25.286.400	24.678.000
Land purchase	650.000	650000				
Planning costs	3.000.000	900.000	900.000	900.000	300.000	0
Total investment costs	**154.871.500**	**33.830.450**	**33.180.450**	**33.180.450**	**28.508.150**	**26.172.000**
Cumulated investment value		33.830.450	67.010.900	100.191.350	128.699.500	154.871.500

Table 5.7 Implementation budgeting – Variant „Macro“.

5.2.3.2 Operating Costs

The operating costs for all components of a variant consider the cost of repair of mechanical and electrical equipment and the maintenance of pipelines. Salaries mainly pertain to the servicing of the distribution system with a total staff of 375 employees. The staffing of well facilities only requires a small number of workers, 2 in Livade and 3 in Budzak. 3 technical employees are required for the treatment plant.

Administrative costs also include compensation payments for reduced use of chemicals and fertilizers in the protection zones of the groundwater sources. These payments are calculated on a per hectare basis.

	Budzak	Livade	Distrib.	Treat-ment	Total	Var/Fixed	Specific
Salaries	18,000	12,000	3,968,400	36,000	4,034,400	fixed	0.45
Spare parts and maintenance	151,750	124,700		1,202,275	1,478,725	var	0.06
Electricity	240,024	110,376		240,024	590,424	var	0.02
Administration incl. Compensations	80,000	80,000		80,000	240,000	fixed	0.03
Other expenses					0	fixed	0.00
Total	489,774	327,076	3,968,400	1,558,299	6,343,549		0.56

Table 5.8 Operating Costs – Variant „Macro“.

Table 5.8 also indicates the cost behaviour of the cost categories. Categories described as variable change along with volumes handled in the system.

With this analysis in particular testing for patterns of tariff increases, thus rendering the analysis to be on a current basis, the operating cost items have to be subjected to inflation. Relevant past inflationary trends have been projected for the various cost categories, whereby medium term projections of the International Monetary Fund[2] for Serbia on general inflation have been used as a guideline, i.e. cost specific inflation trends have been developed proportional to the projection of general inflation. These cost specific inflations (price) trends are:

[2] National authorities; World Bank; and IMF staff estimates and projections

Cost Item	Price trend
Salaries	Nominal Wages
Spare parts and maintenance	Industrial producer prices
Electricity	Light and fuel
Administration incl. Compensations	Nominal Wages

Data on price trends has been taken from the Serbia and Montenegro Statistical Office in IMF 7/05 "Serbia Selected Issues". Table 5.9 presents the development of the applied price trends. After 2011 the respective percentages are estimated to develop at the rate of general inflation.

Current	2005	2006	2007	2008	2009	2010	2011
Nominal Wages	17,4%	16,3%	10,9%	7,3%	6,4%	5,8%	5,6%
Light and fuel	33,2%	31,2%	20,8%	13,8%	12,1%	11,1%	10,7%
Industrial producer prices	16,9%	11,8%	6,7%	4,5%	3,9%	3,6%	3,5%

Table 5.9 Development of Price Trends

All cost categories follow the pattern of operational build-up as presented in Table 5.3 showing the first ten years of the project.

Table 5.10 Operating Costs – Variant „Macro“

Item	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Salaries	0	0	3,193,098	4,965,483	6,162,988	6,972,831	7,097,897	7,222,964	7,348,030	7,473,097
Spare parts and maintenance	0	0	1,067,615	1,624,764	1,975,183	2,245,919	2,297,481	2,349,340	2,401,497	2,449,432
Electricity	0	0	625,737	977,856	1,217,459	1,374,518	1,396,430	1,418,469	1,440,636	1,460,237
Administration incl. Compensations	0	0	189,952	295,389	366,626	414,803	422,243	429,683	437,123	444,563
Total Operating Costs	0	0	5,076,403	7,863,492	9,722,257	11,008,070	11,214,051	11,420,455	11,627,286	11,827,328

5.2.4 Financing

In terms of financing conditions for an international loan an interest rate of 5% has been assumed, with 15 annual repayments starting after the full implementation of the project in 2011. A capitalization of interest is also assumed for the duration of the implementation. The equity portion would be raised by the members of the water association.

In 1,000 EUR

	Total	Share of Total Project Cost	2007	2008	2009	2010	2011
Total Project Cost	154,872	100%	33,830	33,180	33,180	28,508	26,172
Equity	46,461	30%	10,149	9,954	9,954	8,552	7,852
Total Loan requirement	108,410		23,681	23,226	23,226	19,956	18,320
International loan	108,410	70%	23,681	23,226	23,226	19,956	18,320
Loan incl. capitalized interest	123,567		24,273	25,021	26,272	24,233	23,768

Table 5.11 Financing Structure – Variant „Macro“

5.2.5 Financial Results

It is the aim of this financial dynamic analysis to investigate the commercial profitability on the total investment of the project over the project horizon, initially without consideration of the financing structure.

The dynamic analysis on total investment requires the elaboration of cash flow statements. Key indicators of financial profitability are the Net Present Value (NPV) and the Internal Rate of Return (IRR). A Weighted Average Cost of Capital (WACC) has been calculated to be used as the discounting factor in the calculation of NPV. In this regard the dynamic return expectation for equity was assumed to be 3%.

Table 5.12 presents the projected cash flows for the first ten years of operation of the implemented system.

1.000 EUR Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Residual Value
TOTAL CASH INFLOW	-	-	9.813	15.683	19.180	23.824	23.787	24.491	25.264	26.067	26.926	27.851	28.849	29.922	31.075	79.266
Inflow operation	0	0	9.813	15.498	18.649	22.856	22.919	23.695	24.498	25.282	26.090	26.925	27.786	28.675	29.592	
Other income	0	0	0	186	532	968	868	796	766	785	836	926	1.063	1.247	1.483	79.266
TOTAL CASH OUTFLOW	33.830	33.180	39.282	37.268	36.618	11.409	11.229	11.494	11.703	12.291	12.754	13.184	13.629	14.088	14.564	-
Increase in fixed assets	33.830	33.180	33.180	28.508	26.172	0	0	0	0	0	0	0	0	0	0	
Increase in net working capital	0	0	1.026	586	337	401	15	73	75	73	76	78	80	82	85	
Operating costs	0	0	5.076	7.863	9.722	11.008	11.214	11.420	11.627	11.827	12.027	12.228	12.428	12.629	12.829	
Income (corporate) tax	0	0	0	311	387	0	0	0	0	390	651	879	1.121	1.377	1.650	
NET CASH FLOW	(33.830)	(33.180)	(29.469)	(21.585)	(17.438)	12.415	12.559	12.998	13.562	13.776	14.171	14.667	15.220	15.833	95.776	79.266
CUMULATIVE NET CASH FLOW	(33.830)	(67.011)	(96.480)	(118.065)	(135.503)	(123.089)	(110.530)	(97.532)	(83.971)	(70.195)	(56.024)	(41.357)	(26.137)	(10.303)	85.473	

Table 5.12 Financial Cash Flows – Variant „Macro“

Resulting from the above cash flow table, the Internal Rate of return (IRR) is

IRR = 5.34%

The Net Present Value (**NPV**)

Discounted at a weighted average cost of capital (WACC) of 4.45% amounts to **EUR 9.8 million**.

The **payback period**, also called pay-off period, is defined as the period required to recover the original investment outlay through the accumulated net cash flows earned by the project. The cumulative cash flow turns positive after **14 years** of the project, i.e. starting from the beginning of project implementation.

On the basis of the cash flow tables for financial planning a **Minimum Debt Service Coverage Ratio**[1] is calculated at 0.9 in the year 2008, i.e. financing would not be sufficient to cover financial commitments.

As Table 5.13 reveals that, though operational deficits occur once repayment starts. However, under the given assumptions, accumulated cash would be sufficient to cover these shortfalls over a medium term horizon.

[1] The ratio compares operational Net Cash Flows to financial commitments, i.e. interest and principal, thus measuring the ability of project to fulfil its obligations towards lenders.

in 1,000 EUR	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
TOTAL CASH INFLOW	34.422	34.975	46.039	48.469	50.800	23.824	23.787	24.491	25.264	26.067	26.926	27.851	28.849	29.922	31.075
Inflow funds	34.422	34.975	36.226	32.785	31.620	0	0	0	0	0	0	0	0	0	0
Total equity capital	10.149	9.954	9.954	8.552	7.852	0	0	0	0	0	0	0	0	0	0
Total long-term loans	24.273	25.021	26.272	24.233	23.768	0	0	0	0	0	0	0	0	0	0
Total short-term finance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Inflow operation	0	0	9.813	15.498	18.649	22.856	22.919	23.695	24.498	25.282	26.090	26.925	27.786	28.675	29.592
Other income	0	0	0	186	532	968	868	796	766	785	836	926	1.063	1.247	1.483
TOTAL CASH OUTFLOW	34.422	34.975	42.328	41.546	42.066	25.826	25.233	25.086	24.883	25.060	25.111	25.129	25.162	25.209	25.273
Increase in fixed assets	33.830	33.180	33.180	28.508	26.172	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	0	1.026	586	337	401	15	73	75	73	76	78	80	82	85
Operating costs	0	0	5.076	7.863	9.722	11.008	11.214	11.420	11.627	11.827	12.027	12.228	12.428	12.629	12.829
Income (corporate) tax	0	0	0	311	387	0	0	0	0	390	651	879	1.121	1.377	1.650
Financial costs	592	1.794	3.045	4.277	5.448	6.178	5.766	5.355	4.943	4.531	4.119	3.707	3.295	2.883	2.471
Loan repayment (incl. short term)	0	0	0	0	0	8.238	8.238	8.238	8.238	8.238	8.238	8.238	8.238	8.238	8.238
SURPLUS (DEFICIT)	-	-	3.711	6.923	8.734	(2.002)	(1.446)	(595)	381	1.007	1.815	2.722	3.687	4.712	5.801
CUMULATIVE CASH BALANCE	-	-	3.711	10.634	19.368	17.367	15.921	15.326	15.707	16.715	18.529	21.252	24.939	29.651	35.452

Table 5.13 Cash Flows for Financial Planning – Variant „Macro“

5.2.6 Sensitivity Analysis

In order to test the results of the dynamic analysis as expressed by its key indicator, the IRR, in terms deviations from the assumptions, a sensitivity analysis evaluates the impact of changes to aggregate variables.

The aggregate variables considered as critical to the profitability of the project are:

- Cost overrun: changes to initial investment
- Operating costs: changes to all operating cost items, variable and fixed
- Tariffs

Figure 5.1 and Table 5.14 illustrate how certain percentage changes in the given parameters affect the IRR, and thereby the profitability of the project.

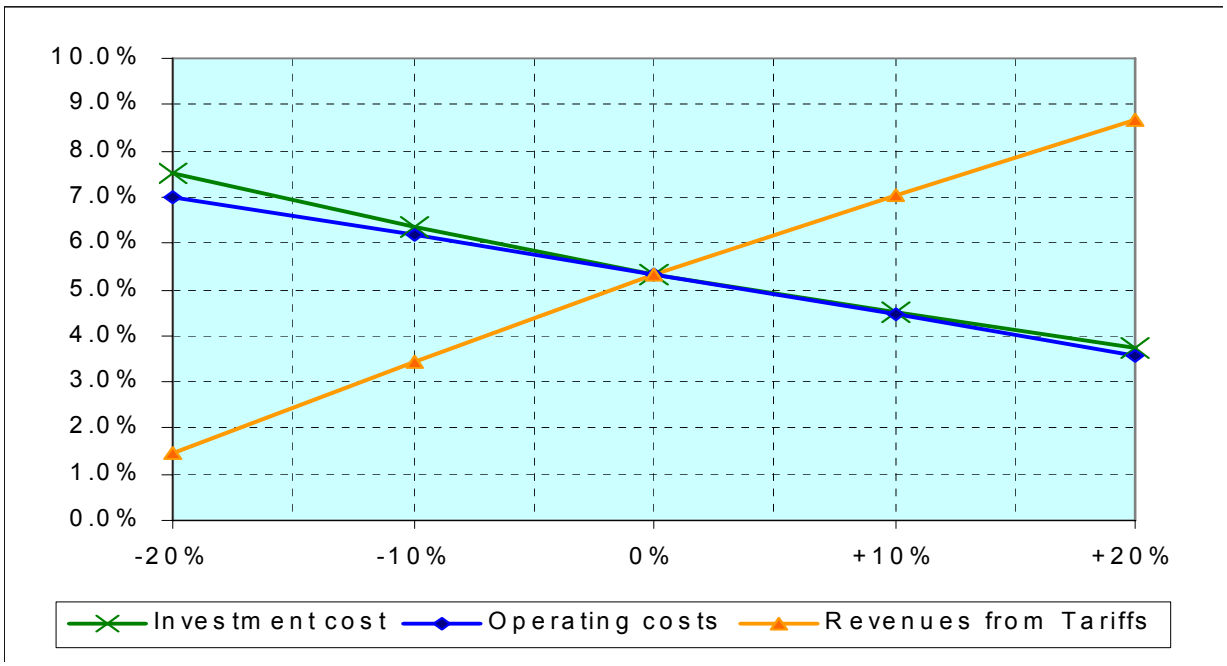

Figure 5.1 Sensitivity Analysis – Variant „Macro“

Changes	-20%	-10%	0%	+10%	+20%
Investment cost	7.5%	6.3%	5.3%	4.5%	3.7%
Operating costs	7.0%	6.2%	5.3%	4.5%	3.5%
Revenues from Tariffs	1.5%	3.5%	5.3%	7.1%	8.7%

Table 5.14 Numerical Results of Sensitivity Analysis – Variant „Macro“

5.3 Aggregation of water services

5.3.1 Overview

"Aggregation" is defined as the grouping of several municipalities into a single administrative structure for the provision of a particular service. This clustering is an essential economic factor for the success of the project and important for a sustainable water supply in this region.
The main findings for this part of the feasibility study were worked out on the basis of a study and several case studies comprised in the World Bank's report on "Models of Aggregation for Water and Sanitation Provision" published in April 2004. The theoretical approach highlighted in that report was adapted to the local situation in West Bačka.

The main driver for aggregation is usually the potential to realise economies of scale by providing services to a larger customer base, and therefore, to render services more efficiently and at a lower cost. Another driver is due to the larger customer base and due to the need for larger investment projects a facilitated access to financial means.

5.3.2 Drivers and Constraints for Aggregation

Depending on the objectives of the aggregation model, mainly the drivers and constraints for this model will decide about the success or failure of a clustering project.

The situation in West Bačka can be seen generally as very critical as far as water quality and water supply is concerned, dozens of municipalities are endangered by contaminated drinking water or water shortage. However, there are also a few that have rather good water quality or at least a secured supply or even both. The main challenge is to bring all municipalities together with the same objective, although they have different problems to cope with in their home communities. Several drivers for aggregation will help to promote this process:

- The urgent need for clean drinking water;
- The need for a sufficient supply with drinking water;
- The access to financial funds and international support;
- The effect of economies of scale and scope for centralised water treatment facilities;
- The access to Private Public Partnership (PPP) due to a more attractive market size;

- The absolute support of the Vojvodinian Government;
- The provision of a sustainable water supply system and water protection measures for the region.

Figure 5.2 Selected Drivers for Water Aggregation in West Bačka

The main constraints for aggregate water services have rather a political than an economical background.
Also the ability to solve water losses is major problem for some cities which is a precondition for the aggregation process.
It is often the assumed loss of power and influence on resources that keeps municipalities away from joint operations.

Clean Drinking Water

In this region people have to concern about their health and even about their lives because of the severe quality of their drinking water. It is about saving lives and handing on a vital and clean environment to the next generation.

Secured Water Supply

In the pilot region of West Bačka the water capacity for 370.000 people cannot be steadily provided by the existing wells or other water sources. For that reason a stand-alone and state of the art distribution system is necessary. Furthermore the existing distribution network will have to be modernised in a short period of time due to leakages and hygienically concerns.

Access to Financial Support

Financing this kind of water projects cannot be handled by the separated municipalities on their own. The aggregation to a common market and the regional extension is a main driver for being attractive to international financing institutes (IFIs), banks and other public or private investors.
The financing conditions set by the donors or the Vojvodinian or Serbian government are a crucial point and influence mainly the viability of the project. The EBRD funds projects starting at project volume of 5 Million Euros. While the EIB only supports beyond a total project volume of 20 Million Euros, or 50% of 40 Million Euros, which cannot be achieved when every municipality only cares for his own.

One constraint is the dependency which will probably arise when several municipalities have a joint loan to bear. This can be mitigated either by contractual precautions or by guarantees from governmental institutions.

Economies of Scale

It is proven that larger associations save more money through procurement and rationalisation in production than smaller ones because they have simply a better work load for their production facilities and are able to bargain a better price for their key inputs.
In West Backa we have an agglomeration of about 62 communities in 9 municipalities which all will (as they join the association) be supplied with water from at most four existing Water Treatment Facilities (WTF) of different capacity and one new WTF. In this case the economy of scale points out that it is more efficient to have one big WTF with a high working load than a large number of widespread local water treatment facilities with an over dimensioned lay out.
On the other hand the limit of economies of scale lies in the inefficiency of to big and complex facilities and structures. The optimal scale has to be found by a cost-benefit analysis.

Access to Private Public Partnership

Private Public Partnership (PPP) will be one of a future cornerstone of the project. The preliminary aggregation should consider (also from the economical point of view) that private investors should be able to participate in this project. PPP requires special management and operational structures as well as legal premises which should be implemented at the same time as or even before the municipalities

form their association. If difficulties with the PPP development arise the aggregation process should preferably be chronologically separated from the PPP implementation.
The municipalities can benefit from PPP through know-how transfer, and more professional and efficient working methods conducted by the private companies.
Depending on the PPP model financial means will also get available for the project.

PPP, then again, may produce protests of the citizen and political parties, because of reducing the influence of the state in its welfare policies.
PPP also implies as already mentioned, certain changes in the administrative culture of water services, as well as impartial international tenders, which are not easy to conduct.

The necessity of PPP has to proven preliminary through economic analysis, cost benefit calculations and the estimation of advantages and disadvantages arising from PPP models. The same conviction the project leaders have in the PPP project has to be communicated and transferred to the public.

Support from the Vojvodinian Government

The political influence on water supply services is very big, because water is a commodity of daily demand and necessity. Therefore it is even more important to have support from high political ranks from the Vojvodinian and Serbian government. This support is essential to find a quick compromise with all municipalities and to foster also a non-bureaucratic implementation.
This driver on political issues can also be a constraint in terms of controversial attitudes between the local government and the municipalities.

5.3.3 Models of Aggregation

Every aggregation is unique due to its members, the legal, political and economical situation and the environmental conditions etc.
In West Bačka we have following situation in brief:

- Possible Members
  - 61 rather small and very rural municipalities and 9 towns
  - Four bigger towns with better infrastructure and
  - Eight municipalities with existing Water Treatment Facilities

  - Three towns with one suitable local well for own supply
- Legal Situation
  - Water rights are a state sovereignty
  - Water tariffs area municipal sovereignty
  - Regulative framework for PPP does exist
  - Regulative framework for water association does exist
- Political Situation
  - Support from Vojvodinian Government
  - Different leading parties in the municipalities
  - Controversial attitude of most parties
- Economical Situation
  - Rural municipalities with poor financial situation
  - Towns with slightly better financial situation
  - Population works mainly in the secondary sector (48%), followed by primary sector (21%)
- Drinking Water Situation
  - Severe water quality in many municipalities
  - Water shortage in many municipalities
  - Two water sources near Apatin and the Danube for water supply
  - Three/Four existing Water Treatment Facilities but not suitable for arsenic removal

5.3.4 Draft Aggregation Model 1 West Bačka

The first aggregation model has the following scope:

- Members
  - Every municipality and town which likes to join under a contractual framework;
- Legal situation
  - Foundation of a new operating company, Special Purpose Company (SPC);
  - Every municipality is founding member of the SPC;
  - Every municipality brings in their water infrastructure in as asset;
  - The municipal (mun.) water service company remains and their staff too;
  - The SPC has sovereignty to set own distribution tariffs;
  - The municipality also keeps is tariff sovereignty but has to pay to the SPC;
  - The mun. staff is a service partner of the new founded company;

  - The SPC is responsible for the drinking water quality until the domestic transfer station;
  - The executive board consists of members (CEO) of the SPC;
- Political Situation
  - The supervisory board of the SPC consists of 5 annually changing members of the municipality;
  - The chairman of the supervisory board is member of the Vojvodinian Government;
- Economical Situation
  - The SPC is receiver of the funds and grants and will conduct the operation and further is the only responsible for the repayments;
  - The accountancy and all financial statements are to conduct in an independent and proper way fulfilling all Serbian laws;
- Operational Issues
  - The SPC provides drinking water for all members of the water association;
  - The maintenance of the Water Treatment Facility will be conducted by the SPC;
  - The mun. service provider is responsible for the maintenance of the mun. distribution system;
- Tariff Issues
  - The municipality/ water service provider bills the normal Water Tariffs as they execute their sovereignty;
  - The municipality/water service provider may receive additional subsidies from the Vojvodinian Government or the mun. itself;
  - The municipality/ water service provider pays a distribution fee to the SPC;
  - The municipality/ water service provider receives a fee for the maintenance of the mun. distribution network;

5.3.5 Draft Aggregation Model 2 West Bačka

The second aggregation model has the following scope:

- Members
  - Every municipality and town which likes to join under a contractual framework;
- Legal situation
  - Foundation of a new operating company, Special Purpose Company (SPC);
  - The municipalities are majority owner of the SPC (at least 51%);
  - A private company (PPP) will be minority owner of the SPC;

- The municipal (mun.) water service providers remain as they were (perhaps with new voluntary administrative changes);
- The mun. water service staff remains;
- The SPC has sovereignty to set own distribution tariffs;
- The municipality also keeps its tariff sovereignty but has to pay to the SPC;
- The mun. staff is a service partner of the new founded company;
- The SPC is responsible for the drinking water quality until the municipal transfer station;
- The executive board consists of members of the SPC (private and public part);

- Political Situation
  - The supervisory board of the SPC consists of 5 annually changing members of the municipality;
  - The chairman of the supervisory board is member of the Vojvodinian Government;
- Economical Situation
  - The SPC is receiver of the funds and grants and will conduct the operation and further is the only responsible for the repayments;
  - The accountancy and all financial statements are to conduct in an independent and proper way fulfilling all Serbian laws;
- Operational Issues
  - The SPC provides drinking water for all members of the water association
  - The maintenance of the Water Treatment Facility will be conducted by the SPC;
  - The mun. service provider is responsible for the maintenance of the mun. distribution system;
- Tariff Issues
  - The municipality/ water service provider bills the normal Water Tariffs as they execute their sovereignty;
  - The municipality/water service provider may receive additional subsidies from the Vojvodinian Government or the mun. itself;
  - The municipality/ water service provider pays a distribution fee to the SPC;

5.3.6 Summary

The scope of both models is only drafted and needs to be worked out in detail, especially the legal part of rights and responsibilities.
The two models differ mainly:

- in the participation of a private partner (PPP) in model 2;
- in the ownership of the mun. distribution system;
- in the maintenance fee from SPC to the municipality/water service provider in model 1;
- in the expansion of the responsibility from mun. transfer station to domestic transfer station in model 1

5.4 Private Sector Participation

A Private Sector Participation (PSP) is aimed within this project because of three reasons:

- Restructuring of the current public water supply administration is necessary with a private partner and a SPC it is by far easier to implement.
- Achieve a more cost efficient operation and maintenance period
- The IFIs preferably facilitate PSP Projects

There are several possibilities for a PSP in this project. It depends on the following factors:

- Ownership of the existing assets (water works)
- Guarantor and receiver of financial means (grants and loans)
- Transfer of working force
- Integration of Vojvodinian Government (VG) and municipalities in the PSP

Important and detailed background information on this PSP topic is available in the UNIDO BOT Guidelines published 1996 in Vienna as well as Private Sector Participation for Domestic Water Services by Austrian Federal ministry of Agriculture, Forestry, Environment and Water management published 2001 in Vienna. Furthermore, case studies on this topic are available from the EC (Directorate-General Regional Policy) namely the Resource Book on PPP Case Studies, issued June 2004 in Bruxelles.

5.4.1 Overview

In PSP we have two alternatives for a private participation, a private public partnership (PPP) as cooperation model to share a common public duty and an operator model where the private partner overtakes public duties for a (short or long) period of time.

In West Backa we can work out both possibilities to look which one suits better for the current and future situation.

The cooperation model is less integrated than an operator model but may also share duties with a vicarious agent for special public duties (auxiliary legal person).

This appraisal for a PSP/PPP model is very rough and has to be elaborated in detail with legal experts of Serbian law and tender and PSP/PPP issues.

The following statements will direct one plausible, cost efficient and in any case not controversial way for a new PSP/PPP model.

Main cornerstones of a PSP/PPP model are:

- Financing
- Construction
- Operation/Maintenance
- Legal Issues

5.4.2 Public Private Partnership

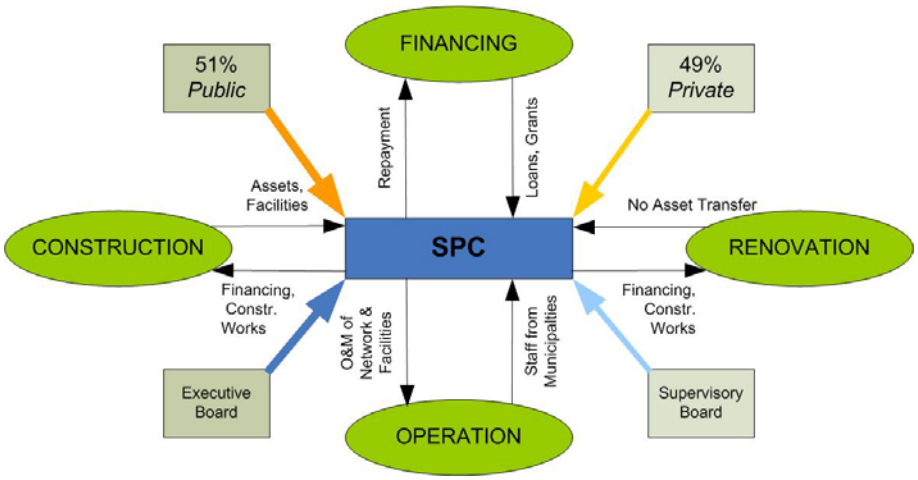

Figure 5.3 Scheme of a Public Private Partnership

5.4.2.1 Financing

Within a PPP model we have two possibilities for funding the project. One is to set up a private financing with a public guarantor which has slightly higher credit conditions than the alternative, a pure public financing.

The public finance has the better financial conditions but in fact an insufficient organisational structure to control and distribute this money.

Therefore the financing for the water supply project should be carried out by the SPC as donor receiver and the VG as guarantor. The municipalities take of course part in the SPC but they don't

have that good financial standing to act like a loan receiver or guarantor. If the private partner becomes insolvent the assets will fall to the VG. Since the other part belongs to the municipalities it would be a better control mechanism to have a second owner for the SPC.
The SPC receives the loans from the IFIs and the involved banks, and has also the responsibility for the repayment. The local bodies concentrate on levying the water tariffs and finding appropriate ways to increase the water tariffs while still securing the affordability.
The earnings of the SPC for the repayment derive from the network utilisation charge (NUC) paid by the municipalities through their collected tariffs. Every municipality can have their own tariffs as presently but can also harmonise with others. As well, they can subsidies their tariffs with special budgets. This network utilisation charge paid for every m³ of drinking water is a simple quantity dependent value and shall be harmonised throughout the region of West Backa.

5.4.2.2 Construction

The private part of the SPC (a consortium) carries out the construction works for all new network parts and facilities of the water supply system. Further, the SPC has the responsibility for the management and coordination of the construction works. The municipalities have influence on the SPC through their majority in the ownership 51 % and the Executive Board, which is the decision making entity within the SPC. The risks of constructions have to be borne by the SPC and their subcontractors. Additional areas of building land have to be provided by each owner (municipality or VG) or redeemed from private owners by the SPC, if necessary.
As far as the existing network is concerned a renewal has to be borne by the SPC as well but there will be no asset transfer from municipality to the SPC. If the loans from the donors are not sufficient for the complete renovation it has to be partly financed by the municipalities or the VG. The repayment has to be done by the end of the contract period at the latest.
The extent of renewal has to be evaluated in different analysis and than negotiated with the SPC who is in charge of the complete renovation in the area of West Backa and has to coordinate the construction and financial means.

5.4.2.3 Operation and Maintenance

The operation part is most important to the cost efficiency of the project, not only because it is the longest stage of the project with 20 to 30 years of duration but also the sensitive matter water needs to be handled properly in order to provide a stable and secure supply of water. These necessities for

security would become be very cost expensive in long term if wrong legal and operational structures have been established or costly working routines have been implemented.
It is definitely the SPC who is responsible for the operation and maintenance (O&M) of the supply network system.
The borderline of the responsibility for the network system is (1) at the connection station to the private and public houses or industrial entities. Therefore the service team for O&M has to be expanded with the local water works of each municipality. This personal will be transferred to the SPC and will get new contracts on private business basis.
As an alternative (2) the municipal water service providers stay in the O&M duty and keep their work force or at least major parts of it. Therefore the borderline for the service responsibilities will be the transfer station from the new network to the local network of the municipality.

Further important is the transfer of the assets and the SPC to a total public owned entity at the end of the contract period. In any case the possibility for an extension of the contract period has to be installed in the overall PPP contract.
If the contract will not be prolonged the minority and private part of the SPC has to be overtaken by the municipalities or by the VG. Another possibility is a new tender for the private operation of the water supply network.

5.4.2.4 Legal Issues

Important entities for the whole PPP model are the Executive Board and the Supervisory Board. The executive board is the steering committee of the SPC and consists of either of three public representatives and two private or one public and one private representative and a delegate from the VG. There are many possibilities for a lean and efficient management solution. However, the power of the last decision shall rather stay in public hands.
The Supervisory Board has a monitoring task and also will have influence on the personal composition of the Executive Board. This board will consist of members of the municipalities, the local water service providers and the VG.
All rights and liabilities of every entity will have to be clearly determined in agreements.

Other legal issues have to be defined more precisely in special contracts:

- Consortium Agreement
- SPC Agreement
- Financing Contract

- Investment Agreement (to have certain investments within a time frame)
- Milestone Contract (to achieve certain objectives within a time frame)
- Construction Agreement
- Off Take Agreement
- Operation and Maintenance Contract
- Insurance Contracts
- Risk Allocation Agreement

5.4.3 Operator Model (BOT Model)

The operator model is, in general, less integrated with the VG and the municipalities. There will also be a SPC which is simply called Consortium, in contrary, this time the SPC is in 100 % ownership of the private consortium. The water association consists of the municipalities and their water service providers.

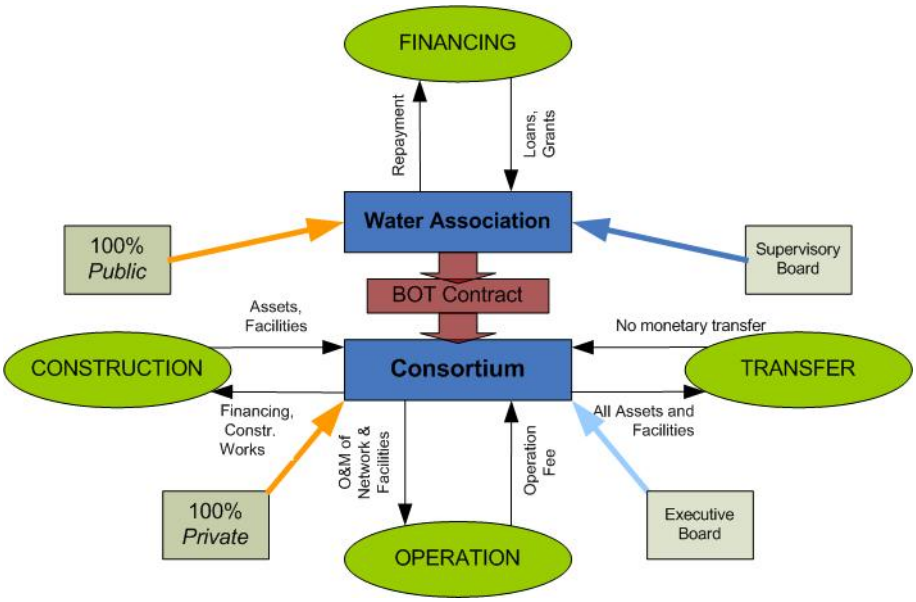

Figure 5.4 Scheme of BOT Model

5.4.3.1 Financing

The financial structure is quite different to the cooperation model. The water association is responsible for the financing and is also the receiver of the loans. Additionally the VG or the municipalities may apply for financial means to ensure and facilitate the renovation of their local water networks. The Consortium is financed by an Operation Fee which is contractually agreed and covers the O&M costs.

This fixed sum will be negotiated every year and the private partner shall gain a profit from the elevation of the efficiency of his water works. The repayment of the loans will be financed by the budgets of the municipalities, Vojvodinian Government and the State.
The tariff sovereignty of the municipalities will stay unchanged.

5.4.3.2 Construction

The consortium will conduct all construction work itself and with special subcontractors for some sophisticated technologies. All construction risks will lie in the consortium's hands.
The renovation of the local water network will also be carried out by this consortium, as they had to bid for the complete construction package at the tender procedure. This will be financed by the municipalities and also stays in their ownership and responsibility. For this purpose it is again suitable to have a water association of all involved municipalities which applies for money altogether to have better credit conditions

5.4.3.3 Operation and Maintenance

The O&M of the new distribution network and the facilities will be carried out by the consortium whereas the local networks stay in charge of the municipalities and their water works. The staff of the SPC will consist of both newly employed very skilled workers and transferred ones from the municipal water works. The borderline for the responsibility transfer will be connection station between new network and the municipality. In order to fulfil a stable O&M both service entities have to work together and have to agree on an O&M contract.

5.4.3.4 Transfer

The transfer at the end of the concession and contract period is contractual structured and consists of the transfer of all assets and facilities, the over taking of the staff and a complete know how transfer from the private to the public entity. Whether the legal organisation of the corporation will also be changed or not depends on the strategic planning of the water association.

5.4.3.5 Legal Issues

The Executive Board at the water association is responsible for the compliance of the public part with the agreements. It is also the steering committee and carries out the operational and strategic planning

for the water association. The board consists of member from the municipalities and other shareholders like the VG or even private entities if they are in the association.

The Supervisory Board has the responsibility to monitor and consult the consortium in financial and technical questions

The legal issues have to be defined more precisely in special contracts:

- Consortium Agreement
- BOT Agreement
- Financing Contract
- Investment Agreement (to have certain investments within a time frame)
- Milestone Contract (to achieve certain objectives within a time frame)
- Construction Agreement
- Off Take Agreement
- Operation and Maintenance Contract
- Insurance Contracts
- Risk Allocation Agreement

5.4.4 Financing and Operation Model

This PPP Model differs only in terms of financing from the other BOT model. In this case the private consortium has the total control over the project except of the supervisory board which has the monitoring function.

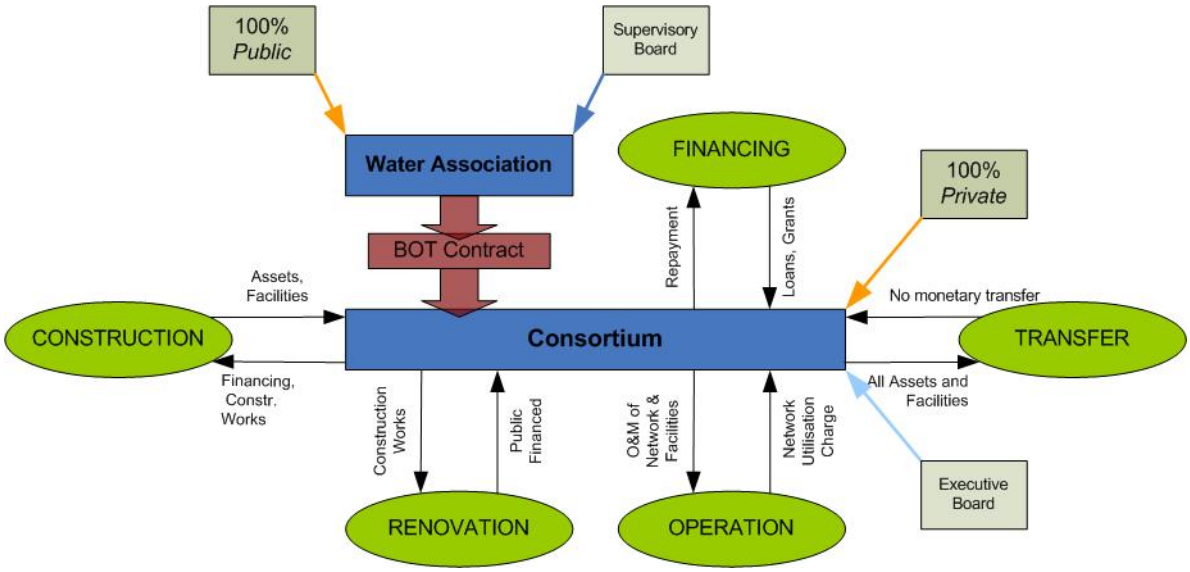

Figure 5.5 Financing and Operation Model (BOT)

5.4.4.1 Financing

The BOT structure is subject to a Public Financing Initiative (PFI) which means that the complete finance is provided by the private consortium. The repayment and the operation are financed by the Network Utilisation Charge (NUC) that is collected from the municipalities. With this charge the entire costs of the O&M and the repayments have to be covered. Additionally, a concession fee for the utilisation of public rights can be determined. Accordingly, also this charge has to be covered by the NUC. The renovation will be financed completely by public means. Therefore the water association may request for financial support from IFIs or EU structural funds.

5.4.4.2 Construction

The construction is carried out completely by the consortium as well as all renovation activities. The facilities will stay in property of the consortium until the end of the concession period.

5.4.4.3 Operation and Maintenance

Like in the other BOT model the O&M will be carried out by the Consortium. The borderline for the service operation will be at the transfer station from the new distribution system and the existing network which still belongs to the municipalities. The staff transfer from the public to the private service provider will be carried out according to the requirements for manpower of the private operator.

5.4.4.4 Legal Issues

The increased influence from the private consortium on the public service has to be countered by a narrowing of the legal framework. Public service has always the intention to provide service to the people and not to gain extensive profits.

- Consortium Agreement
- BOT Agreement
- Financing Contract
- Investment Agreement (to have certain investments within a time frame)
- Milestone Contract (to achieve certain objectives within a time frame)
- Construction Agreement

- Off Take Agreement
- Operation and Maintenance Contract
- Insurance Contracts
- Risk Allocation Agreement

5.4.5 Summary

In the near future there will be a lot of changes in the legal environment of water supply services. Mainly due to the privatisation of the public services most regulations will not stay the same.
However, some statements for the general direction of the PSP/PPP model can be made:

- The majority of the ownership of the SPC stays in public hands (except BOT model)
- The sovereignty of the tariffs stays at the municipalities' side.
- The construction is carried out under the coordination and control of the SPC.
- All completely new build distribution pipes and treatment sites will be in the ownership of the SPC.
- The SPC will receive a charge from the municipal authority or from the water association for the operation of the distribution system.
- The SPC will be responsible for the repayment of the loans (except BOT model there it is the private consortium)
- The SPC has to be monitored by a supervisory board which consists of members from either the VG or the municipalities or both.
- The duration of the concession period is at least 25- 30 years.

ANNEX

Water Aggregation

The optimum size for water associations depends on several parameters like:

- Relation between served population and size of water network;
- Ability to harmonise administration and operating entities;
- Topography and distance between municipalities;
- Allocation of water sources within the association.

Drivers for Economies of Scale are in detail:

- The need for large investments at one time leads to cost efficient expenditures through a bigger scale (here project size);
- The specific costs per m³ water distributed can be reduced by larger facilities and lean operational structures;
- Additional skilled staff is needed.

Constraints may comprise:

- Inefficient old facilities cannot easily turned into efficient ones;
- Probable reduction of unskilled workers.

In order to have the acceptance of the people and the employees, all advantages in contrast to all disadvantages of an aggregated and disaggregated investment have to be calculated and afterwards made public to all stakeholders.

Contrary to the economies of scale the economies of scope have the effect that through centralisation of management tasks and bundling of operations cost savings will occur.
Depending on the depth of aggregation the economies of scope will have a bigger effect the more tasks will be shared or transferred.
On the other hand the deeper the aggregation is the more complex the reorganisation and reforming of the existing structure will be.

Generally the type of model and the grade of integration and cooperation within the association depend on different factors:

- Legal framework has to allow to build aggregations (and limits different possibilities);
- The administrative ability of the service providers to work together;
- Political willingness;
- Amount of political sovereignty of the local authorities;
- Financial power of the municipalities and international funding possibilities;
- Condition and future development of local infrastructure, investment requirements;

Figure 5.7 gives an overview on the range of possibilities under certain key characteristics:

Key Characteristic	Range of Possibilities (with increasing aggregation)
SCALE	
What can be the scale of the aggregated structure?	A few neighboring towns Several towns, neighboring or at a distance All towns in a given region or river basin Most towns in the country ("national utility")
SCOPE	
What services can be aggregated?	Water production (bulk water sales) Whole water service Water and sanitation Water and energy … and others (solid waste, street lighting, heat…)
What operating functions can be aggregated?	Operations Management Procurement Investment Financing All functions, with merging of assets and staff
PROCESS	
Should the aggregated structure be temporary or permanent?	• Temporary, for a specific objective such as investment or access to private sector participation • Permanent, with practical limits on exit
What process can be followed?	• Voluntary • With incentives (financial, political, etc.) • Mandatory

Figure 5.6. Range of Dimensions of Aggregation.

Scale

The scale of the cluster depends on the willingness of the municipality to take part, and on financial feasibility (which considers distance to distribution network, technical equipment, investment needs, water quality). Therefore three general groupings are possible:

- Group of municipalities
  - Neighbouring towns with similar size or small municipalities with the same size
  - Bigger towns serve several small surrounding municipalities
  - Non neighbouring municipalities which need common services or infrastructure
- Regional groupings
  - Joined through the same topography (river basin, valley, flatland)
  - Joined through the same problem (contaminated water, water scarcity)
  - Joined through the same municipality policies regarding water service
- National Association for Water Services
  - RE-grouping of former decentralised public services (whole County Vojvodina, whole Region of Bačka)

For the outcome of the project it is probably less decisive if the aggregation is called “a group of neighbouring municipalities” or “a joint regional grouping due to problems with contaminated water”.

Scope

The scope or content of the aggregation can reach from simple know how transfer without commodity transfer up to an integrated and newly founded company which provides not only water service but also wastewater and waste services.

Operation:

- Joined system operation
- Maintenance
- Quality control
- Commercial functions
- Customer billing and relation

Management:

- Financial and technical management
- Strategic and operational planning
- Human resources

- Legal departments

Procurement:

- Of regular or specialised inputs
- Commodities and services (contracting etc.)

Investment:

- For maintenance works and modernisation
- For new large scale projects
- For sourcing financial means

West Backa first of all needs an association for distributing drinking water to the people with some additional organisational and operational features. Further service and administrative aggregation is possible but can be conducted step by step.

Process

Aggregation can either be permanent or temporary. Temporary aggregation refers to circumstances when municipalities decide to work together for reaching a particular objective and revert back to their individual operation once it has been reached. Temporary aggregation is usually based on carrying out a specific project that requires bringing in particular skills, or for which a certain scale must be reached.

More commonly, permanent aggregation is introduced through the creation of a specific entity that is going to operate the services in an aggregated manner, and when the aggregated entity builds physical assets that cannot be easily broken up between members. This permanence is generally enshrined in a legal instrument, such as legislation or an agreement established by the association.

Due to the fact that not only the construction of the distribution network is necessary but also the operation and maintenance etc. a temporary aggregation is not suitable.

On the other hand when the whole operation is done by a private partner, remaining in an association is no longer required.

The benefit of this project is really obvious and therefore no mandatory for clustering the municipality is needed. In case it is important the Vojvodinian Government will take suitable measures to bring the municipalities together.

Besides the unchallengeable economical arguments to set on water aggregation there are still factors which may block any progress in water services. To overcome negative influences capacity building and promoting discussions with all stakeholders from the very beginning are absolutely essential.
Generally, every party might have different objectives within the same project. The only way to bring all members and leaders together is to find a compromise even when it is the least common denominator.

Structure of the Aggregation Model

The structure and framework for the aggregation should rather depend on the needs and requirements of the participating municipalities than on political issues. Decisive points deal with concerns of:

- Legal structure of the new associations
  - Loose association
  - Association with own administration and staff
  - Foundation of new entity
- Rights and responsibilities of new and former service providers
  - Stay at municipalities and former service providers
  - Transfer to new service provider
  - Split of rights and responsibilities
- Supervision of new service providers
  - Control by all members
  - Self-control by new entity
  - Control by higher public authority
- Transfer of sovereignty rights to new founded entities
  - Encashment
  - Tariff sovereignty
  - Human resources management
- Allocation of voting rights and decision making
  - According to the population size
  - According to the served consumers
  - According to the value of assets
  - One vote for each member
  - Specific power for dominating members

- Asset transfer and ownership rights
    - Shared facilities, shared ownership
    - Retention of ownership
    - Transfer facilities to new entity

Further points concern about the environmental, economic surroundings

- Water sources
    - Inequality in water resources
        - Extra fee for water rights
        - No compensation for exploiting water sources
- Tariff level
    - Inequality in water tariffs
        - Remain of tariff systems for all municipalities
        - Harmonisation of tariff levels

The agreement bases on contractual rights which should include clear policies for the following points:

- Entry requirements to the aggregation
    - Contribution on assets and facilities
    - Financial minimum standards and capability
    - Administrational compatibility
- Exit regulation
    - Adequate exit period
    - Return or redeem asset and financial value