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JAPAN INTERNATIONAL COOPERATION AGENCY

No. 2

MINISTRY OF AGRICULTURE, WATER MANAGEMENT AND FORESTRY
BOSNIA AND HERZEGOVINA

THE FEASIBILITY STUDY ON THE WASTEWATER TREATMENT PLANT OF SARAJEVO CITY IN BOSNIA AND HERZEGOVINA

FINAL REPORT

VOLUME Ⅱ : MAIN REPORT

NOVEMBER 1999

TOKYO ENGINEERING CONSULTANTS CO., LTD.
NIHON SUIDO CONSULTANTS CO., LTD.

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FINAL REPORT

CONSTITUENT VOLUMES

VOLUME Ⅰ	SUMMARY REPORT
VOLUME Ⅱ	MAIN REPORT
VOLUME Ⅲ	ASSESSMENT WORK REPORT
VOLUME Ⅳ	APPENDIX

EXCHANGE RATE

KM 1.00 = DEM 1.00 = JPY 71.20

(Status as of 24 May 1999)

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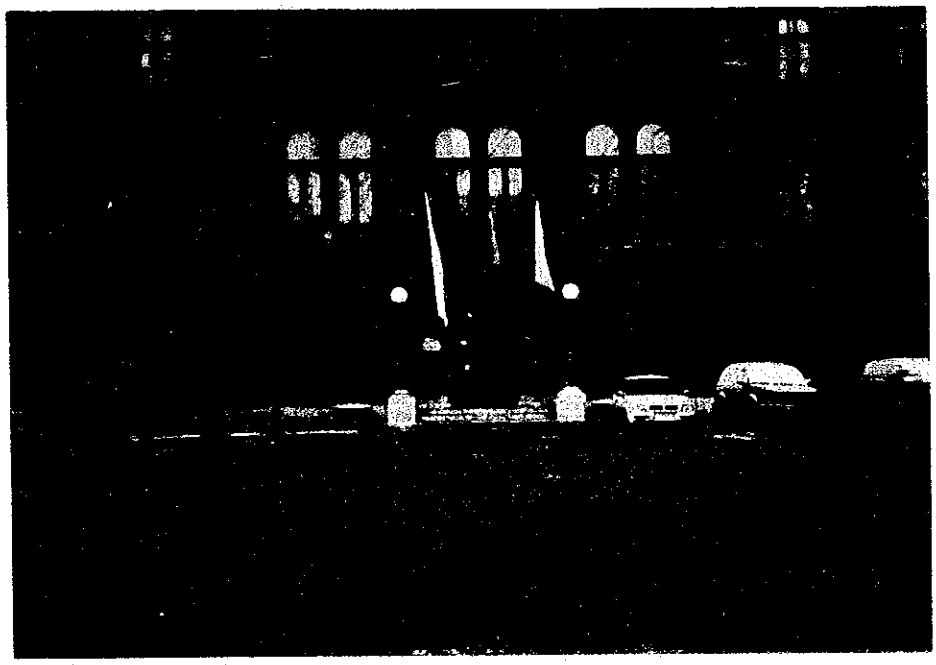
ABBREVIATIONS

ACP	=	Asbestos Cement Pipe
BiH	=	State of Bosnia and Herzegovina (Union of Federation and RS)
CIMIC	=	Civil Military Cooperation
CIP	=	Cast Iron Pipe
DCIP	=	Ductile Cast Iron Pipe
DM	=	German Mark (1 DM=1 KM)
DORS	=	Directorate for Renovation of Sarajevo
EC	=	European Commission
EDS	=	Electric Distribution Sarajevo
EPBiH	=	Public Enterprise Electroprivreda of Bosnia and Herzegovina
EU	=	European Union
FBiH	=	Federation of Bosnia and Herzegovina
FINIDA	=	Finland Agency for International Development
F/R	=	Final Report
GDP	=	Gross Domestic Product
HT	=	High Tension
IC/R	=	Inception Report
IMG	=	International Management Group
IT/R	=	Interim Report
KM	=	Convertible Mark (Official currency of State of BiH)
LT	=	Low Tension
MAC	=	Mine Action Center
IMK	=	Institute of Material and Structures
MOAWMF	=	Ministry of Agriculture, Water Management and Forestry
MLSS	=	Mixed Liquor Suspended Solids
MOFA	=	Ministry of Foreign Affairs, Bosnia and Herzegovina
NATO	=	North Atlantic Treaty Organization
NPA	=	Norwegian Peoples Aid
ODA	=	Official Development Assistance
OHR	=	Office of High Representative
PCWA	=	Public Company for Watershed Area
pf	=	pfenning (100 pfenning = 1 KM)
RS	=	Republika Srpska (Serb Republic)
NATO	=	North Atlantic Treaty Organaization
SFOR	=	NATO Stabilization Force
UN	=	United Nations
USAID	=	United States Agency for International Development
VBH	=	Vodoprivreda BiH: Canton of Sarajevo Water Resources Management Public Corporation
ViK	=	Canton Public Communal Company, "Water Supply and Sanitation"
WB	=	World Bank
WTP	=	Willingness to Pay
WWTP	=	Wastewater Treatment Plant

CHAPTER 1. INTRODUCTION



CHAPTER 1. INTRODUCTION

1.1 BACKGROUND OF THE STUDY

The military conflict in Bosnia and Herzegovina which started in April 1992 eventually came to a halt through a peace agreement that was reached in December 1995. With the onset of peace in Bosnia and Herzegovina, a peace fulfillment conference was held in December 1995 and a framework was decided to support in the public welfare sector by the international community towards the fulfillment of peace.

The sewerage system is an area that suffered a dramatic decline in function. The existing WWTP in Sarajevo is inoperative due to the absence of maintenance, damages caused during the conflict, and natural deterioration. As a result, raw sewage is being discharged into rivers without treatment. Moreover, it is forecasted that the water quality of the receiving rivers will deteriorate even further once factories re-start operation.

The wastewater treatment plant (hereinafter referred to as the WWTP) was never maintained during the conflict because of its location, which is at the forefront of the fighting. The absence of maintenance works and damages directly caused by the war necessitates large-scale repairs on the sewerage system particularly the Sarajevo WWTP. Therefore, necessary action should be carried out to the Sarajevo WWTP as early as possible in order to improve the water quality of the Miljacka River and the Bosna River.

1.2 OBJECTIVES OF THE STUDY

The objectives of the Study are the following:

(1) to conduct a feasibility study for the rehabilitation of the WWTP of Sarajevo City, that contributes to the recovery of the sanitary and environmental conditions of the city; and

(2) to transfer technology on planning methods and skills to counterpart personnel in the course of the Study.

1.3 SCOPE OF THE STUDY

1.3.1 Study Area

The Study area will cover the present urbanized area to include the sewerage planning area and the Sarajevo WWTP. However, in order to finalize the study area, the Team will review the on-going "Long Term Solutions of Water Supply and Wastewater Drainage and Treatment in the Canton of Sarajevo" project. The said project which is financed by Kuwait Found will serve as basis for the Study. The Study area is shown in the **Fig.1.1** and **Table 1.1** (the more detail is shown in **Section 3**).

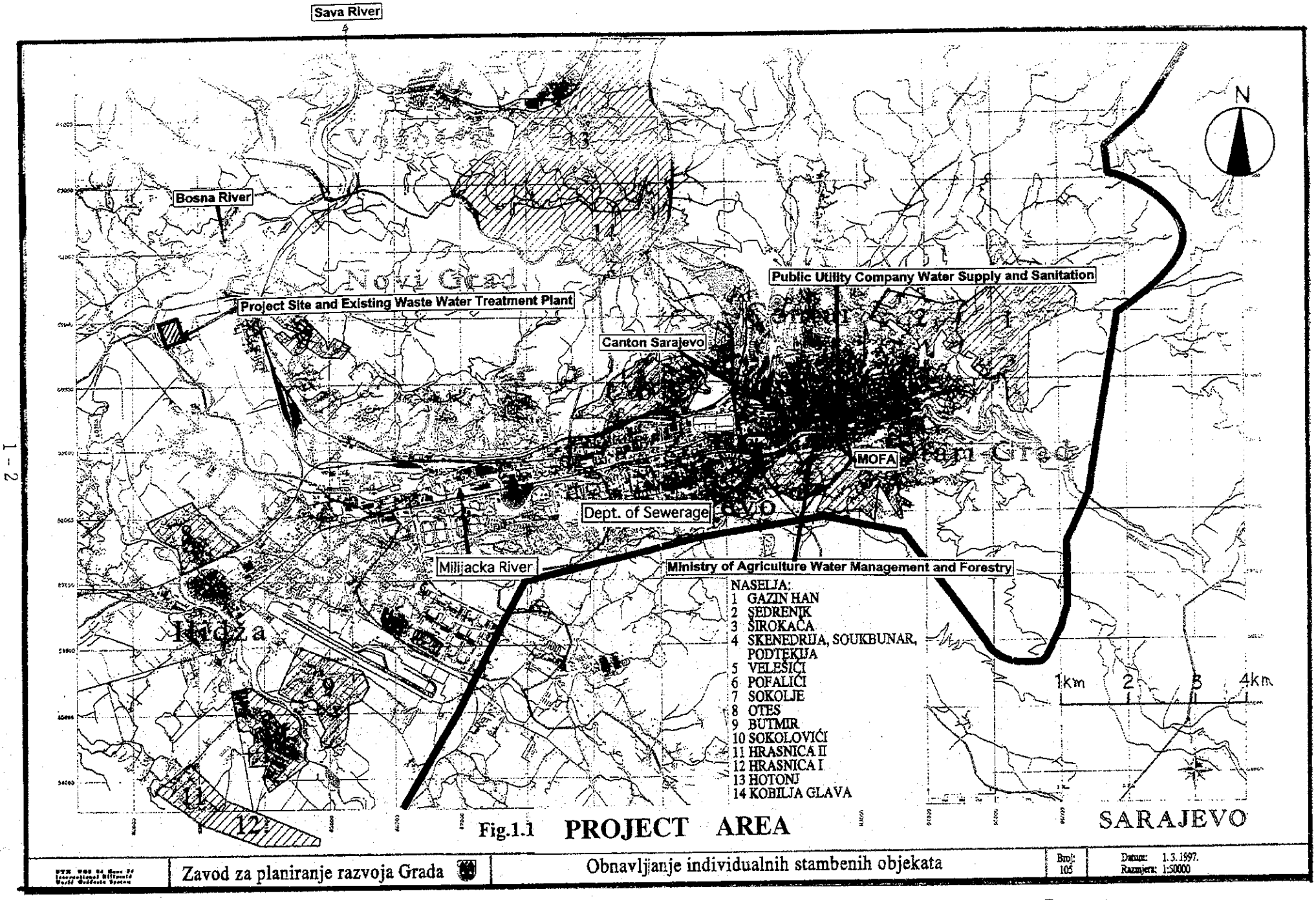


Fig.1.1 **PROJECT AREA**

	Zavod za planiranje razvoja Grada	Obnavljanje individualnih stambenih objekata	Broj: 105	Datum: 1.3.1997. Razmjera: 1:50000

Table 1.1 STUDY AREA

Name Of Sewerage Zone	Sewerage Area (ha)	
	2000 (year)	2015 (year)
1. Central Sarajevo Sewage Zone	7,900	13,950
2. Vogosca/Ilijas Sewerage Zone	1,700	3,050
Total	9,600	17,000

1.3.2 Target Years

In order to determine the target years for this project, the study team has worked out the justification of previous report based on the preliminary study report published by JICA in September 1998. The team has observed that the target year for priority reconstruction project is the year 2000 and that of long term solution is the year 2015.

1.3.3 Contents of the Study

The contents of the study are the followings:

Review of Present Plan

(1) Collection and analysis of existing data and information
   1) physical conditions, socio-economic conditions and financial conditions
   2) rules and regulations regarding environment and sewerage
   3) other relevant rehabilitation and development plans and their studies
(2) Analysis on the existing conditions of the sewerage system in Sarajevo City
   1) WWTP including original plan and the extent of destruction
   2) analysis of existing organization and institution regarding sewerage system management
(3) Field Survey
   1) survey on quality and quantity of current sewage flow
   2) survey on conditions of pipeline and WWTP
   3) survey on existing conditions of the untreated effluent and the receiving rivers.
   4) topographic and geological survey, if necessary
(4) Identification of problems and issues on the existing WWTP
(5) Forecast of future frame-work

Formulation of Basic Plan for rehabilitation of WWTP

(1) Setting up criteria for rehabilitation of WWTP
   1) quality and quantity of sewage inflow
   2) quality of treated water
(2) Establishment of strategy for rehabilitation of WWTP
   1) establishment of targets for urgent rehabilitation and medium to long term rehabilitation
   2) preparation of alternative plans for rehabilitation
   3) evaluation of alternative plan and selection of proper plan

Feasibility study on urgent rehabilitation of WWTP

(1) Preliminary design of facilities

(2) Formulation of construction plan
(3) Formulation of procurement plan for machinery and materials
(4) Formulation of operation and maintenance plan
(5) Formulation of organization, institution and human resources development plan
(6) Preliminary cost estimates
(7) Formulation of financial plan
(8) Environmental impact assessment
(9) Project evaluation

1.4 UNDERTAKING OF THE STUDY

BiH has accorded privileges, immunities and other benefits to the Study Team, and through the authorities concerned, taken necessary measures to facilitate smooth conduct of the study. The Government of Japan, through JICA, has taken necessary measures to dispatch the Study Team to BiH and to perform technology transfer to the BiH counterpart personnel in the course of the study.

The Study Team commenced the work on 23rd January 1999, starting with the fieldwork in BiH from 7th February 1999 upon arrival in Sarajevo to undertake the initial survey and discussions with the ViK for the study. The first field work lasted until 4th April 1999 and the study team left BiH on the next day. The work for the Stage I of the study was completed and the results thereof were presended in the form of an Interim Report, which will be submitted to the BiH and other agencies concerned in May 1999.

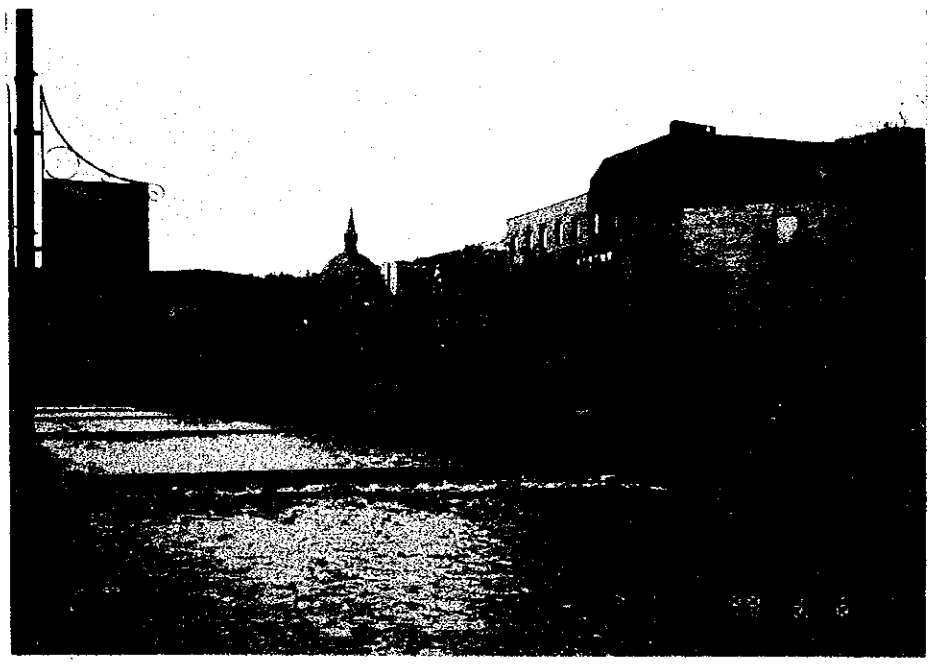
Following the discussions and confirmation of the Interim Report, and in particular identification of the First Phase Program up to 1999, the Study Team commenced the second fieldwork for the feasibility study (F/S), which lasted from May to November 1999.

1.5 ACKNOWLEDGEMENTS

The courtesy and cooperation extended to the Advisory Committee and the Study Team during the course of the study by the following agencies that are gratefully acknowledged.

-Ministry of Foreign Affairs, Bosnia and Herzegovina
-Ministry of Agriculture, Water Management and Forestry, Federation of Bosnia and Herzegovina
-Canton Ministry of Urban Planning Housing and Utilities in Sarajevo (VBH)
-Canton Public Communal Company, "Water Supply and Sanitation"(Vodovod i Kanalizacija: ViK)

CHAPTER 2. PRESENT CONDITIONS OF THE STUDY AREA



CHAPTER 2. PRESENT CONDITIONS OF THE STUDY AREA

2.1 INTRODUCTION

This chapter describes the existing and future conditions of the study area that provides sufficient background information and data for the succeeding chapters. The information describe herein will be used as basis for the determination of the design criteria, analysis of the alternative programs for the reconstruction of the Sarajevo Wastewater Treatment Plant (WWTP) and the determination of the impacts of the proposed action. The descriptions that are explained in this chapter include the following information.

(1) Natural environment that describes the location, geology, topography and climatic conditions of the study area.
(2) Socio-economic condition, both local and national.
(3) Population and land use data.
(4) Organizational structure of the responsible and concerned authorities.
(5) Assessment of the existing and future development plan of the water supply system.
(6) Assessment of the existing sewerage system to include the Sarajevo WWTP.
(7) Water quality and environmental condition.

Data and information presented in this chapter as listed in the Appendix are largely collected on site and are the results of the first field survey and investigations conducted in the study area between February and April 1999. However, the water quality and environmental investigations will be repeated during the second field survey between May and July 1999, in order to get the condition during summer.

Unless otherwise stated, all cost data presented in this chapter and in the **Appendix** are of the beginning of the 1999 prices. The planning period to be adapted for the first phase of this project is up to year 2000 and for the long-term is up to year 2015.

2.2 NATURAL CONDITIONS

2.2.1 Location

The Canton Sarajevo is located in the southeast region of the Federation of Bosnia and Herzegovina (FBiH) at latitude 43.52° north and longitude 18.26° east (see Fig. 2.1). It is Canton No. 9, the center of political, economic, educational and cultural activities of FBiH. This canton which is composed of nine municipalities is fast rising from the ruins of the 3½ years of civil war (1992-1995). With the help of international donor organizations and foreign countries, repairs to infrastructure which is essential to economic revival is peaking up. The city development is moving towards its glorious past, once an economically and culturally diversified metropolis, which made Sarajevo the capital of the Federation of Bosnia and Herzegovina.

2.2.2 Topography and Geology

Mountainous and rolling terrain, with gentle slopes at the city center characterize the topography of Canton Sarajevo.

The midland valley area (Ave. elevation is about 510m amsl), where the municipalities of Stari Grad, Centar, Novo Sarajevo and Novi Grad are located is bounded by mountain ranges as high as 1,530 meters above mean sea level (amsl) and drains towards the River Miljacka. The southeast region (Ave. elevation is about 500m amsl), where the towns of Ilidza and Hadzici are located is also bounded by mountain ranges as high as 1,500 meters and slope towards River Zeljeznica and other river tributaries. Both Miljacka and Zeljeznica join River Bosnia in the periphery of the town of Ilidza, where the Sarajevo WWTP is located. The River Bosnia then travels northward, traversing the canton's hilly towns of Vogosca and Ilijas and farther north before finally joining the River Sava at the federation's north border town of Bosanski Samac.

According to the geological report prepared for the Sarajevo WWTP, the geology of the region comprises predominantly of limestone bedrock overlain by Tertiary and Quaternary deposits which can be found beneath the valley, such as the Sarajevsko Polje. Alluvial deposits with some layers of clay that are overlying the limestone bedrock can also be found in riverbanks and the Sarajevo water supply wellfields.

Figure 2.1 PROJECT LOCATION

2.2.3 Climatic Conditions

The region is subjected to frequent precipitation with an average annual rainfall observed in the period between 1989-1998 at approximately 906 mm. High intensity showers are experienced during early summer and late fall. January has the least average precipitation at 45 mm, while October has the highest average precipitation at 98 mm.

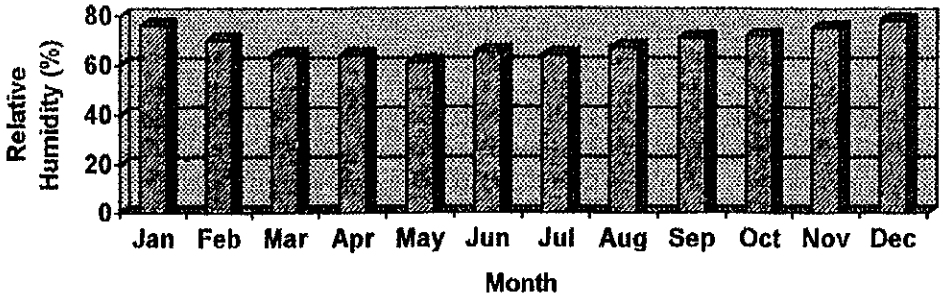
Sarajevo has a very cold and snowy climate experienced in late November to early March. Then the temperature starts to rise in April until September. February is the coldest month with an absolute minimum temperature of minus 17°C, while July is the hottest month with an absolute maximum temperature recorded at 37.4°C. The average annual temperature in the region observed during the last 10 years is 9.9°C.

The minimum relative humidity in the study area is experienced at the end of spring during the month of May at approximately 61%. December has the highest recorded relative humidity at 78%. The average annual relative humidity in Sarajevo is at 69%. **Figure 2.2** and **Table 2.1** illustrates and summarizes the overall climatic condition of Canton Sarajevo.

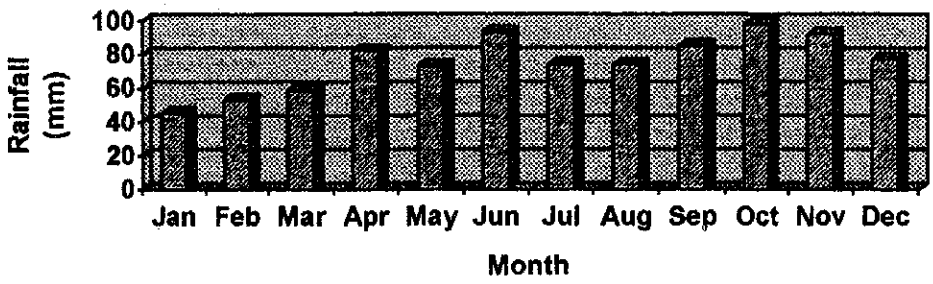
Table 2.1 CLIMATIC CONDITION OF CANTON SARAJEVO, YEAR 1989-1998

Month	Temperature (°C)			Rainfall (mm)	Relative Humidity (%)
	Average	Absolute Maximum	Absolute Minimum	Total	Average
January	0.3	15.6	-15.8	45	76
February	2.1	21.0	-17.0	53	70
March	5.3	25.2	-9.9	59	64
April	9.1	26.6	-6.0	82	64
May	14.1	32.6	1.6	73	61
June	17.7	34.2	0.8	93	65
July	19.8	37.4	5.6	74	64
August	19.5	37.0	4.6	74	67
September	15.5	34.2	1.8	85	71
October	10.6	30.4	-7.4	98	72
November	4.9	24.0	-13.4	92	75
December	0.4	18.0	-14.8	77	78
Annual	**9.9**	**37.4**	**-17.0**	**906**	**69**

RELATIVE HUMIDITY OF SARAJEVO, Period 1989-1998



RAINFALL INTENSITY OF SARAJEVO, Period 1989-1998



MONTHLY TEMPERATURE OF SARAJEVO, Period 1989-1998

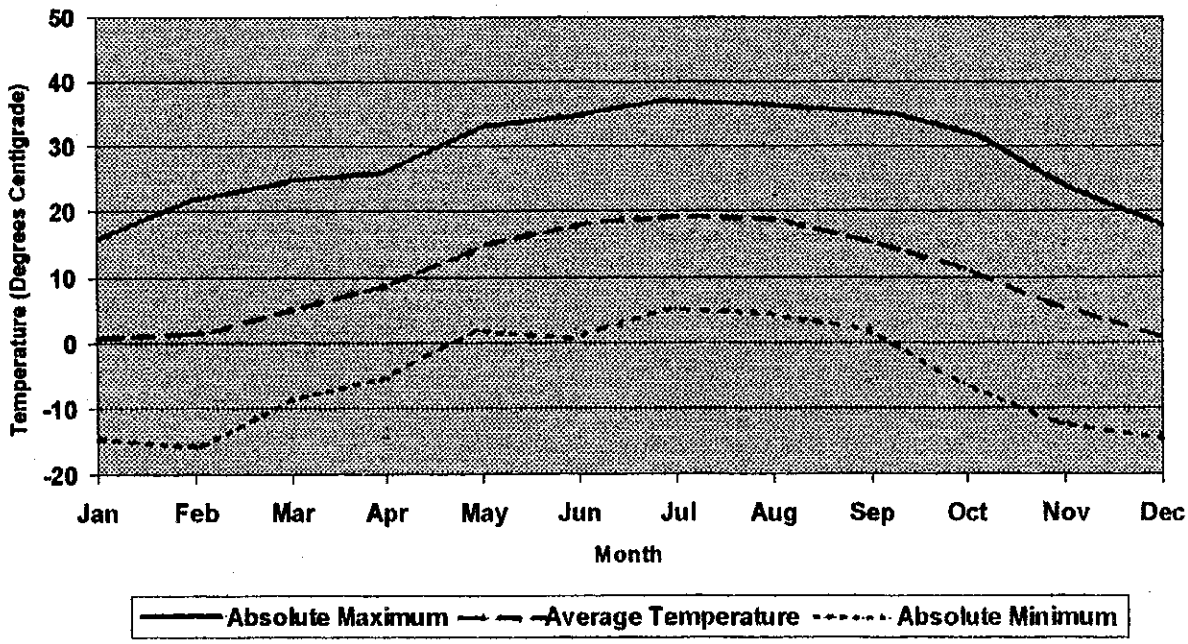


Figure 2.2 CLIMATIC CONDITIONS OF SARAJEVO

2.3 SOCIO-ECONOMIC CONDITIONS

2.3.1 Social and Political Conditions

The interethnic civil conflict in Bosnia and Herzegovina began in the spring of 1992 when the then government of Bosnia and Herzegovina held a referendum on independence and the Bosnian Serbs responded with resistance. In November 1995, the warring parties signed a peace agreement (Dayton Agreement) that halted the tragedy, which had lasted for nearly four years.

As of August 1999, the State of Bosnia and Herzegovina (BiH) comprises two Entities and one District. Those two Entities are the Federation of Bosnia and Herzegovina (FBiH) and the Serb Republic (RS). The status of District has been given to Brcko. The major institutions of BiH are a three-member Presidency, the Council of Ministers, a bicameral National Parliament, the Central Bank, and the Constitutional Court. Both FBiH and RS have their own governments under the Constitution of BiH, which guarantees democratic processes within BiH.

2.3.2 National and Regional Situations

The economic data of BiH and FBiH are summarized in **Tables 2.2 and 2.3**.

Table 2.2 ECONOMIC DATA OF BIH

Nominal GDP 1997	DM 5,803 million
Per capita GDP 1997	DM 1,612
Nominal GDP 1998 *	DM 7,292 million
Per capita GDP 1998 *	DM 2,025
Exports of goods 1997 *	US$ 450 million
Imports of goods 1997 *	US$ 2,950 million
Trade balance 1997 *	−US$ 2,500 million
Current account balance 1997 *	−US$ 1,300 million
External debt 1997	US$ 4,076 million
Foreign reserves 1997	US$ 684 million
Labor force 1996	1,397,000
Unemployment rate 1996	64%
Production of selected industrial items 1991	
(% of total industrial output)	
Electricity	13%
Coal mining	6%
Textile	9%
Finished wood products	7%
Fabricated metal products	9%
Food processing	8%

Source: FBiH Statistical Institute, WB, OHR, EIU
* Estimation

Table 2.3 ECONOMIC DATA OF FBIH

Nominal GDP 1997	DM 4,189 million	
Per Per capita GDP 1997	DM 1,904	
Nominal GDP 1998 *	DM 5,348 million	
Per capita GDP 1998 *	DM 2,431	
Composition of GDP 1997	Agriculture and fishery - 13.6%	
	Industry - 21.4%	
	Trade - 19.6%	
	Education - 5.6%	
	Construction- 4.9%	
	Government administration - 7.4%	
	Transport & communication - 6.1%	
	Other - 21.4%	
Production of selected industrial items 1997 (% of total industrial output)		
	Electricity 31%	
	Coal mining 11%	
	Textile 7%	
	Finished wood products 8%	
	Fabricated metal products 4%	
	Food processing 13%	
Imports 1997	DM 2,488 million	
Exports 1997	DM 174 million	
Trade structure 1997 (000 USD)	Imports CIF	Exports FOB
Food	1,420	2,602
Beverage & tobacco	28	1,110
Raw materials	14,673	19,848
Mineral fuels	464	8,648
Chemicals	1,167	2,315
Manufactures	14,768	33,292
Machinery & transport	10,640	17,594
Miscellaneous manufactures	14,790	23,218
Total including others	57,993	108,683
Retail price % change May 99/May 98		-0.9%
Short term loan rate (average as of the end of 1997)		25%～34%
Demand deposit rate (average as of the end of 1997)		5%
Average net wages as of April 99		376 KM/month
Unemployment rate as of April 99		39%
Employment as of April 99 (pers)		262,273
Unemployment as of April 99 (pers)		407,179

Source: FBiH Statistical Institute, WB, OHR, EIU

* Estimation

BiH data are synthesized from BiH and RS data. Therefore, due to the slower economic recovery of RS, resultant BiH indicators are generally sluggish when compared with that of single FBiH.

In terms of national income, BiH and FBiH experienced high growth of GDP after the war. According to estimated data, the nominal FBiH GDP grew by 28 percent in 1998. The growth of BiH GDP in same year was 26 percent. Those figures may be even underestimated because they do not include underground economy.

The unemployment rate in FBiH is 39 percent as of March 1999, which has been gradually improving since the end of the war.

The average net wage in FBiH has increased considerably since the end of the war. Annualized real wage growth was about 20 percent in late 1998. On the other hand, prices in FBiH are more stable. The annualized inflation rate in 1997 was over 12 percent but fell to roughly zero percent by 1999.

Table 2.4 presents the socio-economic comparison among BiH, FBiH and Sarajevo Canton. Sarajevo is one of ten cantons which compose FBiH. Because of being the capital city, the economic power of Sarajevo is strongest in FBiH. For example, compared with the population share in FBiH of 17 percent, its GDP represents bigger share of 24 percent.

Table 2.4 MAGNITUDE OF SARAJEVO CANTON

	BiH	FBiH	Sarajevo	Sarajevo / FBiH
Area (km^2)	51,197	26,111	1,277	5%
Population (000 person)	3,600	2,200	368	17%
GDP (KM Million) *	5,803	4,189	1,379	33%

Source: FBiH Statistic Bureau, OHR
* Data of 1997

Other demographic and economic data of Sarajevo Canton are presented in **Tables 2.5, 2.6, 2.7, 2.8, and 2.9**.

It is estimated that the population of Sarajevo decreased by almost 30 percent during the war. As of the end of 1998, the population is 368,369. Ethnically, the population comprises Muslim-84%, Serb-7%, and Croat-6%. It is noted that about 30 percent of population are refugees. This considerable number of refugees is heavily burdening financial situations of Sarajevo Canton and its utility enterprises.

Nominal GDP of Sarajevo represented as value added, grew 52 percent in 1997 which signifies that most of the industries have grown dramatically since the end of the war. The share of primary industries is relatively small, however it is noted that the forestry has rapidly grew. Principal industries of Sarajevo are manufacturing and mining, trade, public administration, education and culture, traffic and communication, and bank. Among the secondary industries, foods, drink, and tobacco industries account for roughly 70 percent of production.

Table 2.5 DEMOGRAPHIC DATA OF SARAJEVO

	Area (km2)	Population (As of Dec. 31, 1998)				Refugee Population			
						Non refugee	Refugee		
		Total	0-14 years	15-64 years	65- years		Total refugees	From same municipality	From other municipalities
Centar	33.0	65,216	9,408	44,970	10,838	47,438	17,778	10,173	7,605
Hadzici	273.3	19,083	4,107	13,196	1,780	14,380	4,703	1,656	3,047
Ilidza	143.4	42,025	7,795	27,568	6,662	28,571	13,454	587	12,867
Ilijas	308.6	13,942	2,738	9,741	1,463	4,464	9,478	5,558	3,920
Novi grad	47.2	104,878	19,611	73,896	11,371	72,469	32,409	11,876	20,533
Novo sarajevo	9.9	68,058	12,114	43,460	12,484	41,397	26,661	11,097	15,564
Stari grad	51.4	36,374	5,658	25,383	5,333	33,143	3,231	324	2,907
Trnovo	338.4	748	67	431	250	748	0	0	0
Vogosca	71.7	18,045	4,088	12,514	1,443	10,143	7,902	395	7,507
Canton total	1,276.9*	368,369	65,586	251,159	51,624	252,753	115,616	41,666	73,950

	Ethnic composition					Change in population (1998)		
	Total	Muslim	Croat	Serb	Others	Change	Born	Death
Centar	65,216	51,785	4,392	6,899	2,140	161	812	651
Hadzici	19,083	17,995	328	364	396	184	287	103
Ilidza	42,025	36,371	2,542	3,021	91	349	606	257
Ilijas	13,942	12,795	541	459	147	110	199	89
Novi grad	104,878	89,976	6,246	6,444	2,212	669	1,217	548
Novo sarajevo	68,058	48,622	8,798	6,760	3,878	291	839	548
Stari grad	36,374	34,099	688	1,418	169	93	472	379
Trnovo	748	748	0	0	0	-33	2	35
Vogosca	18,045	17,060	361	523	101	112	214	102
Canton total	368,369	309,451	23,896	25,888	9,134	1,724	4,434	2,610

Source: Sarajevo Canton Data (FBiH Statistic Bureau)

Table 2.6 NATIONAL INCOME ACCOUNTS OF SARAJEVO

(Unit: 000KM)

Industry	Gross value of product	Intermediate consumption	Value added	97/96 change	Consumption of fixed capital	Compensation of employees	Operating surplus
Manufacturing and mining	541,067	265,774	275,293	97%	43,299	128,372	3,898
Agriculture and pisciculture	60,036	21,191	38,845	40%	2,791	1,153	849
Forestry	8,108	2,197	5,911	347%	584	3,142	2,115
Water engineering	3,252	2,214	1,039	89%	178	949	-111
Civil engineering	245,217	171,223	73,994	81%	8,445	51,750	11,827
Traffic and communication	220,558	106,199	114,359	72%	60,234	62,748	-9,475
Trade	389,257	162,928	226,330	34%	14,108	65,834	35,964
Catering and tourism	83,576	41,402	42,175	49%	5,374	17,399	6,911
Handicraft trades	80,877	58,290	22,588	-24%	2,144	14,171	2,752
Communal housing activities	80,206	55,602	24,604	80%	51,247	23,947	-29,514
Technical services	202,792	130,404	72,388	-25%	7,842	41,186	13,635
Bank	145,959	38,593	107,366	63%	6,047	40,922	48,336
Property and personal insurance	32,857	15,959	16,897	61%	980	9,018	172
Education and Culture	196,061	71,922	124,138	117%	10,755	81,206	33,246
Health and Social protection	110,533	29,837	80,696	97%	16,090	63,749	1,831
Public administration authorities	248,359	96,280	152,080	28%	5,882	141,689	4,509
Total	2,648,715	1,270,015	1,378,703	52%	236,000	747,235	126,945

Data of 1997

Source: Sarajevo Canton Data (FBiH Statistic Bureau)

Table 2.7 INDUSTRY COMPOSITION OF SARAJEVO

Food and drink	49.3%
Tobacco	20.1%
Textile	1.5%
Clothes and fur	2.9%
Leather, shoes, and fancy goods	1.8%
Forestry processing not including furniture	4.0%
Publishing and printing	5.4%
Coke, oil derivative, nuclear oil processing	1.3%
Chemical products	4.2%
Metal processing	0.8%
Metal products, not including machines	3.0%
Communication equipment and appliances	1.4%
Medicine and optical instruments	0.7%
Furniture, light industry	2.3%
Recycling	1.4%
Total	100.0%

Data of 1997

Source: Sarajevo Canton Data (FBiH Statistic Bureau)

Table 2.8 EMPLOYMENT AND SALARY IN SARAJEVO

Industry	Employment (Person)	Net salary (KM / mth)	Gross salary (KM / mth)
Manufacturing and mining industry	20,004	364	595
Agriculture and pisciculture	29	673	1,287
Forestry	199	430	758
Water engineering	106	287	500
Civil engineering	7,616	288	482
Traffic and communication	6,500	413	720
Trade	7,098	293	480
Catering and tourism	2,209	342	524
Handicraft trades	2,855	256	424
Communal housing activites	3,004	421	779
Financial and other services	6,045	559	923
Education and Culture	8,916	392	728
Health and Social protection	6,744	402	675
Public administration authorities	6,295	487	823
Total / Average	77,620	395	674

Data of 1998

Source: Sarajevo Canton Data (FBiH Statistic Bureau)

Table 2.9 PRICE CHANGES IN SARAJEVO

	Change 97/96	Change 98/97
Total Retail Index	107.5	104.8
Food products - total	103.1	95.8
Agriculture products	104.9	84.7
Industrial products - total	101.1	105.1
Industrial food products	100.8	105.0
Industrial non food products	101.8	105.4
Drinks and tobacco	97.7	103.9
Drinks (alcohol and non alcohol)	99.2	113.8
Tobacco	97.1	100.0
Service	126.4	119.7
Living Cost Index		
Total index	108.9	105.5
Food	101.7	95.9
Tobacco and drinks	97.1	104.5
Clothes and footwear	116.3	107.8
Housing	111.5	107.2
Flat	159.2	112.6
Heating and lighting	99.4	116.0
Furniture	95.9	97.8
Hygiene and health	92.1	109.3
Education and culture	111.9	128.1
Transportation and telephone	131.7	112.1
Goods	102.4	101.1
Service	130.4	120.0

Source: Sarajevo Canton Data (FBiH Statistic Bureau)

2.4 POPULATION AND LAND USE

2.4.1 Population

The Federal Institute of Statistics conducts population census once every 10 years with the latest census conducted before the war in 1991. The population of Canton Sarajevo, which was just over half a million before the war broke out, had been greatly reduced by about 34%. After the Dayton Treaty, approximately 39% of the land area of the canton, notably the southeastern region became part of the Republic of Srpska. Significantly, the whole town town and the town center of the municipalities of Pale and Trnovo were lost to the Republic of Srpska, respectively. This phenomenon greatly reduced the population of Canton Sarajevo.

For the purpose of the project's planning horizon, the 9 municipalities that comprise the Canton Sarajevo has been grouped into 2 sewerage zones, namely: Central Sarajevo and Vogosca/Ilijas. The pre-war census data were taken from the Federal Institute of Statistics, while the post-war data are estimates of the City Planning of Canton Sarajevo. **Table 2.10** shows the census and estimated population of the canton by municipalities, grouped into 2 sewerage zones. Certainly, the City Planning estimated population (that will be shown in the succeeding table) was not only based on the post-war population density but with other factors to include the rate of returnees infrastructure and utilities reconstruction. In projecting the population of Canton Sarajevo from year 2000 to 2015, the City Planning adapted a growth rate as shown in **Table 2.11.**

Table 2.10 CENSUS & ESTIMATED POPULATION OF CANTON SARAJEVO

Municipality	Sewerage Zone	1981	1991	1996	1997	1998	2000	2010	2015
1. Stari Grad	Central Sarajevo	56,181	50,744	43,129	43,562	42,379	49,971	55,738	60,000
2. Centar		72,762	79,286	66,286	64,374	68,097	72,314	87,612	96,250
3. Novo Sarajevo		94,200	95,089	48,799	59,664	67,737	68,700	87,612	98,750
4. Novi Grad		80,559	136,616	95,399	101,090	103,115	120,271	151,188	167,500
5. Ilidza		57,243	67,937	31,755	40,107	41,442	37,500	51,963	58,750
6. Hadzici		20,952	24,200	23,870	17,684	19,653	22,814	23,675	25,000
Sub-total		**381,897**	**453,872**	**309,238**	**326,481**	**342,423**	**371,570**	**457,788**	**506,250**
7. Vogosca	Vogosca/ Ili-jas	18,663	24,647	13,118	16,536	17,662	11,214	18,250	21,250
8. Ilijas		24,316	25,184	11,540	12,766	13,463	3,914	13,813	17,500
9. Trnovo	Trnovo	8,161	6,991	767	719	748	600	2,538	3,250
Sub-total		**51,140**	**56,822**	**25,425**	**30,021**	**31,873**	**15,728**	**34,601**	**42,000**
Total of Canton		**433,037**	**510,694**	**334,663**	**356,502**	**374,296**	**387,298**	**492,389**	**548,250**

Source: Federal Statistical Institute and City Planning of Canton Sarajevo.

Table 2.11 GROWTH RATE FOR POPULATION PROJECTION: 2000-2015

Municipality	Growth Rate, %
1. Stari Grad	1.30
2. Centar	2.10
3. Novo Sarajevo	2.60
4. Novi Grad	2.40
Grad	**2.20**
5. Ilidza	3.30
6. Hadzici	0.70
7. Vogosca	4.70
8. Ilijas	11.30
9. Trnovo	12.80
Canton	**2.50**

Source: City Planning of Canton Sarajevo.

2.4.2 Land Use

Based on the City Development Plan for year 1986-2015 prepared by the City Planning, the land use of Canton Sarajevo is categorized into 29 zones specifically describing the existing land usage as shown in **Fig. 2.3**, and also **Fig. 2.4** shows boundary of municipality area.

The residential zones are subdivided into 5 categories, namely: collective, mixed, individual, individual urban, and vacation houses. The collective and mixed residences are primarily located in the urban centers, such as, Stari Grad, Centar, Novo Sarajevo and Novi Grad where 75% of the Canton population is concentrated. On the other hand, individual residences and vacation houses are scattered in the city suburbs and rural areas.

The business and work zones are mostly located along the stretched of Miljaka River starting from Stari Grad all the way to Novi Grad. Majority of the developed areas in Ilidza is allocated to industry and green areas for recreation and sports.

About 30% of the developed areas of Canton Sarajevo have been categorized as forest zone, with a few as agricultural zones.

Nevertheless, specific portions of the developed area has been declared as areas for special purposes to include water sources, mineral resources exploitation, power, water and wastewater treatment plant, and others.

Trnovo, Ilijas, Vogosca and Hadzici are the less developed municipalities of Canton Sarajevo, with a few portion categorized as residential, business & work areas, and majority as forest areas.

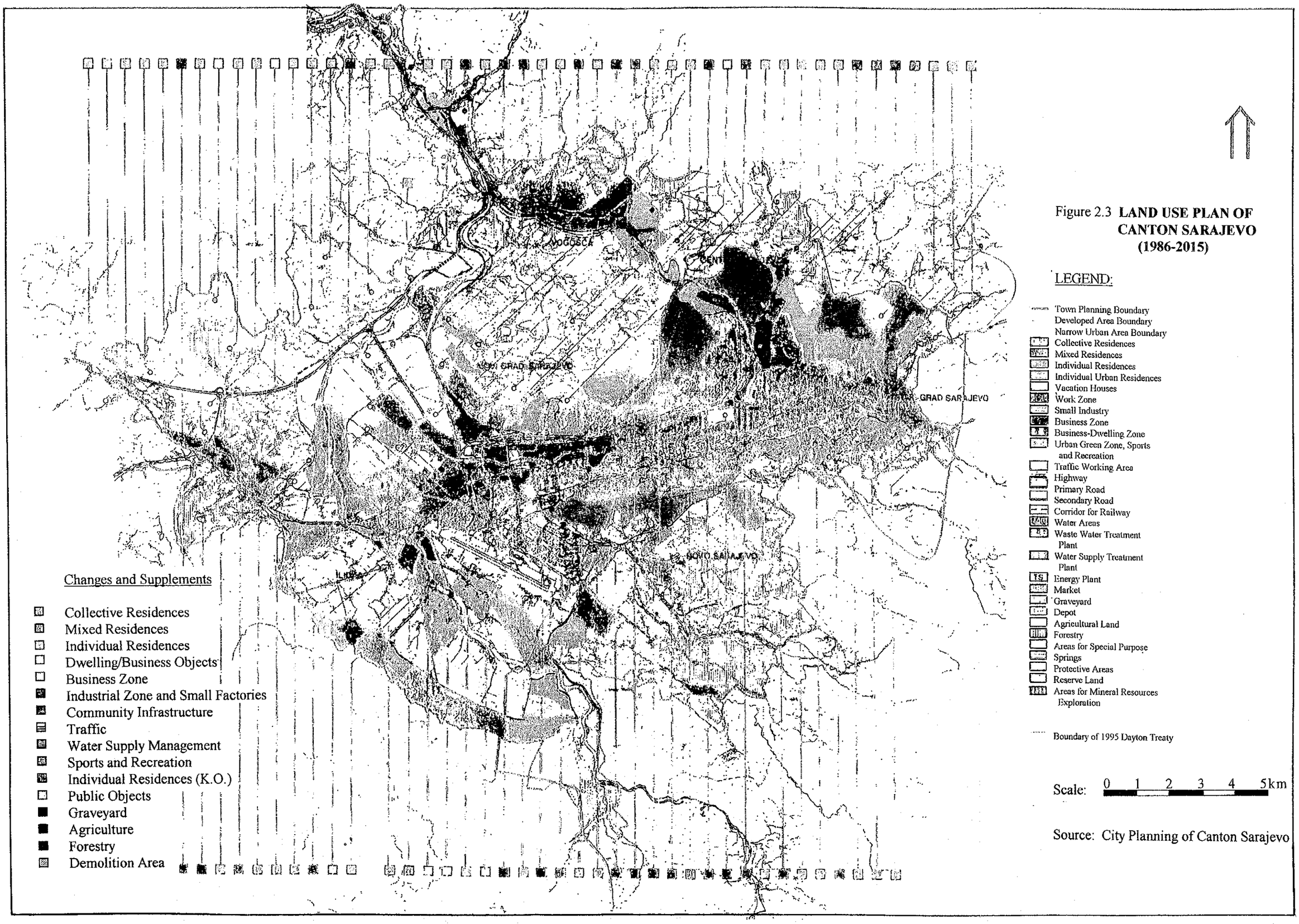
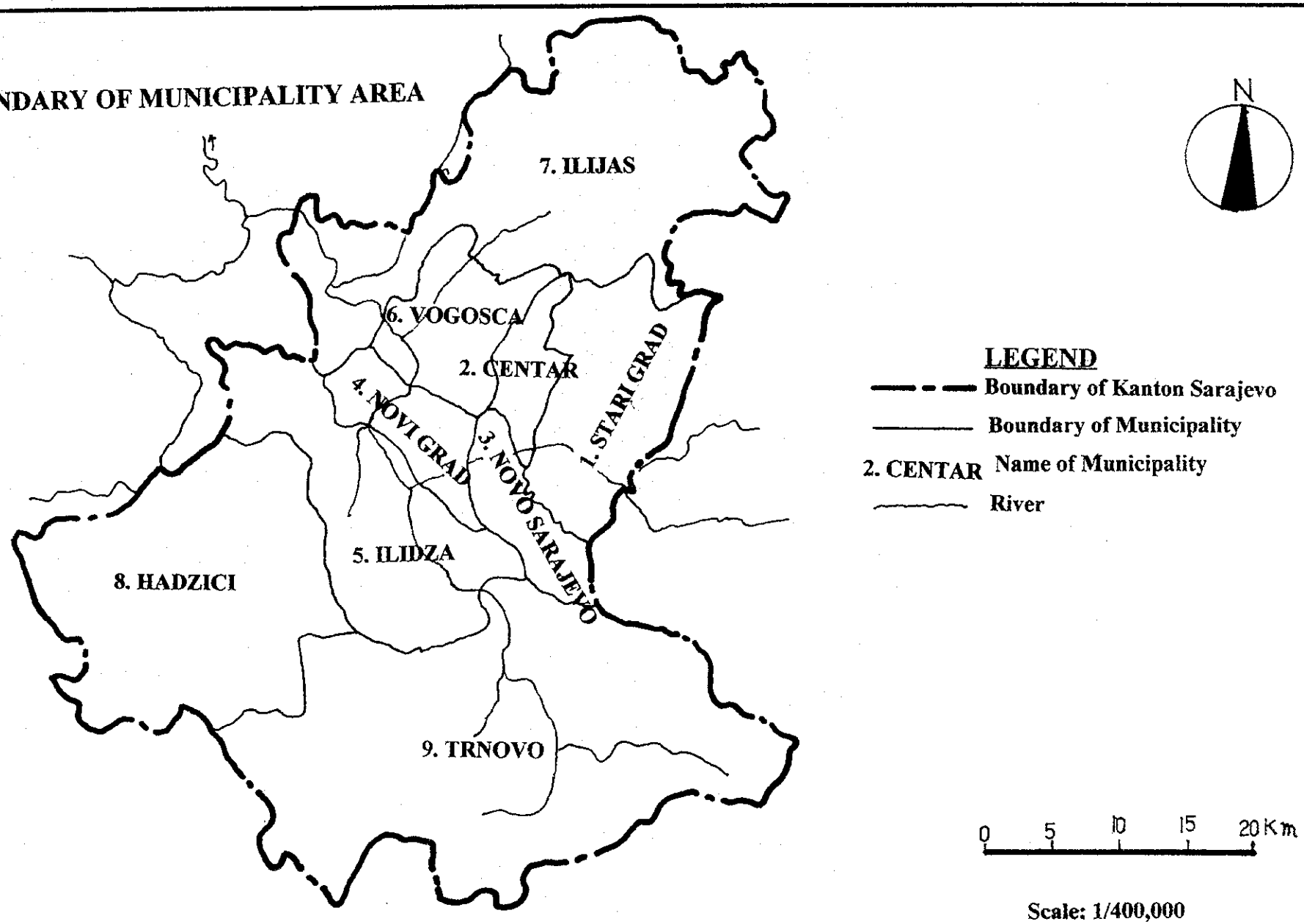


Figure 2.3 **LAND USE PLAN OF CANTON SARAJEVO (1986-2015)**

Fig.2.4

BOUNDARY OF MUNICIPALITY AREA



2.5 INSTITUTIONAL SET-UP

2.5.1 Roles and Interrelationship

(1) National Government

The BiH central government is officially called the Council of Ministers. Its role is confined to matters of foreign affairs, foreign trade, customs and monetary policy, civil affairs and communications. Therefore the constituent members are limited to the followings:

- Co-chairmen (Prime ministers)
- Vice-chairman
- Minister of economic relations and foreign trade
- Minister of foreign affairs
- Minister of civil affairs and communications

The Ministry of Foreign Affairs has a function of executing external borrowings as BiH. The Ministry of Economic Relations and Foreign Trade coordinates activities with both entities (FBiH and RS) in defining program of reconstruction in BiH.

(2) Federal Government

The constitution of BiH provides substantial power on both entities. Accordingly, FBiH has its own president, bicameral parliament and government. FBiH also has responsibility for matters such as defense, internal affairs, police, economic and social sector policies, industry, environmental policies, reconstruction program, refugees and displaced persons, justice, tax and customs administration. The primary members and ministries of FBiH government as of August 1999 are as follows:

- President
- Vice-president
- Prime minister
- Interior
- Justice
- Finance
- Defense
- Energy, mining and industry
- Urban Planning and Environment
- Education, science, culture and sports
- Health
- Social affairs, refugees and displaced persons
- Trade
- Transport and communications
- Agriculture, water management and forestry

Currently, the Ministry of Agriculture, Water Management and Forestry is the competent ministry for water supply and wastewater management within the boundary of FBiH. Under the umbrella of the ministry, and on the basis of FBiH's two watershed areas, two Public Companies

for Watershed Area (PCWA) have been established, namely, the PCWA for Sava River and the PCWA for Adriatic Sea. The former enterprise is responsible for Sava River Watershed and the latter is in charge of Adriatic Sea Watershed. According to the Water Law, the functions of those two entities include long-term planning, supervision, advice and co-ordination as regards water supply, wastewater management, irrigation, flood control and solid waste within each responsible area.

The Ministry of Urban Planning and Environment has the jurisdictional power on environmental protection matters at the federal level.

(3) Cantonal Government

The FBiH is comprised of ten cantons, among which Sarajevo occupies economically and politically a central part. Each canton has its own president, cantonal assembly and government. The constitution of FBiH allows that some of the FBiH's functions may be exercised jointly with the cantons, or separately, or by the cantons coordinated by the federal government. The cantons are responsible for all other matters not granted explicitly to FBiH, such as public services, housing, education, culture and social transfer expenditures. **Figure 2.5** shows Sarajevo Canton's governmental organization, highlighting key ministries and public service functions.

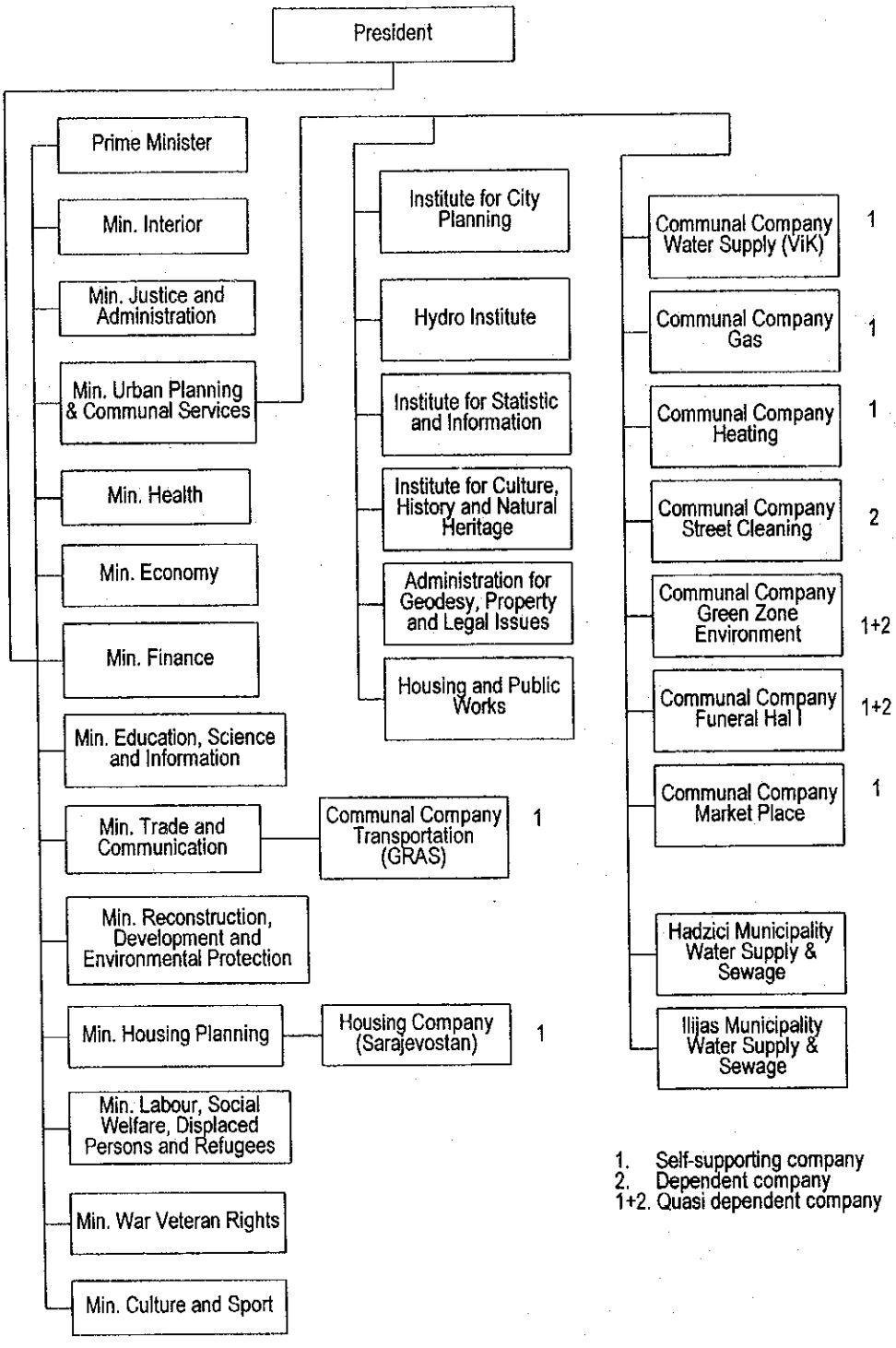


Figure 2.5 MAJOR ADMINISTRATIVE FUNCTIONS OF SARAJEVO CANTON

(4) Interrelationship of Organizations

The organizations stated in proceeding paragraphs are relevant to water supply and wastewater management operations in Sarajevo. Their interrelationships are depicted in **Figure 2.6**.

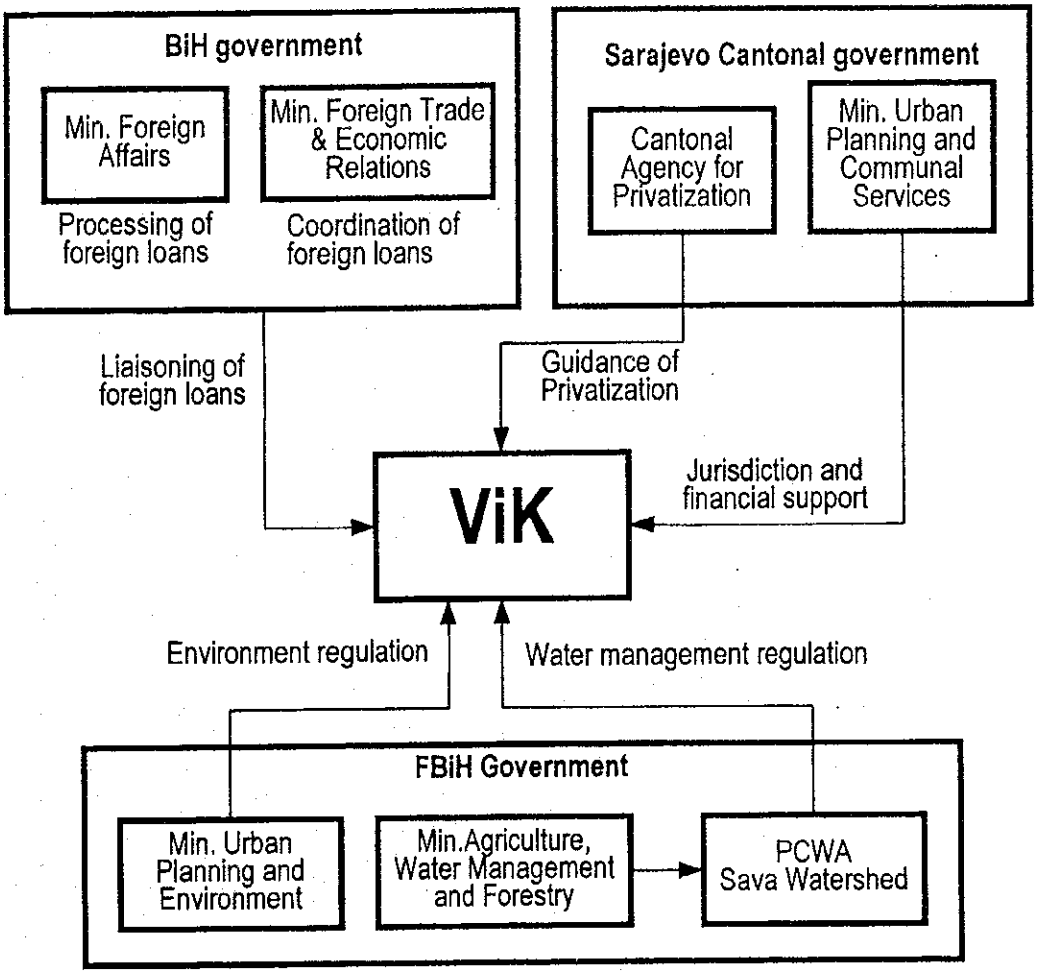


Figure 2.6 INTERRELATIONSHIP AMONG ORGANIZATIONS

2.5.2 Financing

Financing situations of BiH, FBiH, and Sarajevo Canton based on their budget data are analyzed in subsequent sections.

(1) BiH Budget

The budget of BiH is shown in **Table 2.12**. The BiH budget is dependent on FBiH and RS. The main source of revenue is transfers form those two entities because BiH has no principal taxing powers. Responsibilities of the BiH government are confined to areas such as customs policy, central banking policy, external debt, and foreign trade policy. Therefore, aside from external debt servicing, the expenditures are basically of administrative characteristics and do not include

Table 2.12 BiH BUDGET

Expenditure	Year 1999 000 KM	Year 1999 %	Year 1998 000 KM	Year 1998 %	Growth 99/98
BiH Parliament	2,009	3.0%	2,142	4.4%	94%
Salaries	1,409	2.1%	1,714	3.5%	82%
Material	600	0.9%	428	0.9%	140%
BiH Presidency	3,517	5.3%	5,072	10.5%	69%
Salaries	1,598	2.4%	856	1.8%	187%
Material	1,918	2.9%	1,216	2.5%	158%
Fees Int.Org.			3,000	6.2%	
BiH Constitutional Court	761	1.2%	630	1.3%	121%
Salaries	436	0.7%	504	1.0%	86%
Material	325	0.5%	126	0.3%	258%
Cabinet of the Council of Ministers	1,827	2.8%	979	2.0%	187%
Salaries	907	1.4%	706	1.5%	129%
Material	680	1.0%	274	0.6%	249%
Maintenance of the common institutions buildings	240	0.4%			
Ministry of Foreign Affairs	36,526	55.3%	29,403	60.8%	124%
Salaries	3,197	4.8%	2,914	6.0%	110%
Material	1,800	2.7%	1,800	3.7%	100%
Salaries of embassies	17,352	26.3%	17,352	35.9%	100%
Material of embassies	6,178	9.3%	4,338	9.0%	142%
Opening of new embassies	8,000	12.1%	3,000	6.2%	267%
Ministry of Civil Affairs and Communications	6,342	9.6%	2,669	5.5%	238%
Salaries	1,858	2.8%	1,858	3.8%	100%
Material	980	1.5%	562	1.2%	175%
Refugees program	290	0.4%	250	0.5%	116%
State Treasury (Salaries)	324	0.5%			
Fees International Organization	2,890	4.4%			
Ministry of Economic Relations and Foreign Trade	3,908	5.9%	4,899	10.1%	80%
Salaries	2,786	4.2%	2,242	4.6%	124%
Material	1,122	1.7%	658	1.4%	171%
Consultants			2,000	4.1%	
Other Beneficiaries	4,300	6.5%	2,600	5.4%	165%
Civil Aviation Dpt.	700	1.1%	800	1.7%	88%
Property claims com. CRPS	200	0.3%	200	0.4%	100%
Chamber for Human rights	200	0.3%	200	0.4%	100%
Ombudsperson Human R.	200	0.3%	200	0.4%	100%
De-mining com.	200	0.3%	200	0.4%	100%
Statistical Agency	200	0.3%			
Foreign Trade Agency	200	0.3%			
Border Commission	200	0.3%			
Telecom Regulatory Agency	200	0.3%			
New institutions	2,000	3.0%			
Other institutions			1,000	2.1%	
Running reserves	6,230	9.4%			
Other liabilities	653	1.0%			
Total expenditure	66,073	100%	48,395	100%	137%

Revenue					
Transfer from FBiH	27,000	40.9%	3,362		803%
Transfer from RS	13,500	20.4%	6,667		202%
Other revenue	25,573	38.7%			
Total revenue	66,073	100%			

Debt servicing	153,485				

Source: OHR

any material capital expenditure. As a result the budgeted expenditure was less than 1 percent of GDP in 1998.

(2) FBiH Budget

The budget of FBiH is shown in **Table 2.13**. In 1998, the budgeted expenditure was roughly 15 percent of GDP. The main sources of revenue is custom duties and excises. Major expenditure items are defense and social costs for disabled, which occupy altogether as much as almost 80 percent of total budgeted expenditures. Capital expenditure is rather small, amounting to KM 14 million or 1.5 percent of total budgeted expenditure in 1999.

(3) Sarajevo Canton Budget

The budget of Sarajevo Canton is presented in **Table 2.14**. It is estimated that the budgeted expenditure was more than 30 percent of GDP in 1998. Sarajevo budgetary expenditure consists primarily of capital investments, education, and health spending. It is important to note that the amount of capital investments is more than KM 200 million, which is by far bigger than that of FBiH. In revenue side, the biggest source is sales tax, accounting for more than 40. Individual and corporate income taxes combinedly occupies the second biggest part of revenue.

Table 2.13 FBiH BUDGET

	Year 1999		Year 1998		Growth
Revenue	000 KM	%	000 KM	%	99/98
Tax revenue	777,000	90.8%	645,015	89.5%	120%
Custom duties	330,000	38.6%	311,571	43.2%	106%
Excise	434,000	50.7%	323,077	44.8%	134%
Excise on imported goods	364,000	42.5%	267,286	37.1%	136%
Excise on domestic goods	70,000	8.2%	55,791	7.7%	125%
Tax on profit	13,000	1.5%	10,367	1.4%	125%
Non tax revenue	43,000	5.0%	37,297	5.2%	115%
Federal taxes and fees	11,200	1.3%	10,001	1.4%	112%
Fines in accordance with the Federal Regulations	2,000	0.2%	1,549	0.2%	129%
Special fees	29,500	3.4%	25,273	3.5%	117%
Other revenue	300	0.0%	474	0.1%	63%
Capital revenue	35,800	4.2%	35,850	5.0%	100%
Foreign grants		0.0%	2,560	0.4%	0%
Total revenue	855,800	100%	720,722	100%	119%
Credits from international financial institutions	64,200		59,391		108%
Expenditure					
Current expenditure	906,286	98.5%	749,243	96.1%	121%
Salaries and expense allowance of employees	76,447	8.3%	70,413	9.0%	109%
Gross salaries	64,101	7.0%	59,704	7.7%	107%
Expense allowance of employees	10,947	1.2%	9,462	1.2%	116%
Allowance for the Representatives of the FBiH assembly	1,399	0.2%	1,247	0.2%	112%
Contribution of Employer	6,883	0.7%	6,880	0.9%	100%
Material and service expenditure	28,595	3.1%	31,456	4.0%	91%
Travel expenditure	2,863	0.3%			
Energy expenditure	2,281	0.2%			
Communal service expenditures	1,721	0.2%			
Purchase of material	8,164	0.9%			
Expenditures for transportation service and fuel	1,272	0.1%			
Renting of property and equipment	2,147	0.2%			
Expenditures for current maintenance	3,944	0.4%			
Insurance and bank service expenditures	1,359	0.1%			
Contracted services	4,843	0.5%			
Defense expenditures	368,000	40.0%	276,005	35.4%	133%
Current transfers	351,245	38.2%	303,570	38.9%	116%
Exhumation transfers	933	0.1%	1,000	0.1%	93%
Election transfers 1999	634	0.1%	1,930	0.2%	33%
BiH financing transfers	20,000	2.2%	20,567	2.6%	97%
Canton transfers	2,500	0.3%	6,993	0.9%	36%
Transfer for health care institutions of importance	933	0.1%	1,300	0.2%	72%
Transfer for High school, Science, Sport, Culture	2,332	0.3%	3,320	0.4%	70%
Transfer for displaced persons and refugees	3,000	0.3%	6,400	0.8%	47%
Transfer for disabled and exceptional material security	271,000	29.5%	209,321	26.8%	129%
Transfer for pensions	9,000	1.0%	12,665	1.6%	71%
Transfer for Political Parties	756	0.1%	811	0.1%	93%
Transfers for Citizens Associations and others	1,575	0.2%	1,769	0.2%	89%
Transfers for Publishing and Public Bulletins	1,399	0.2%	1,508	0.2%	93%
Transfer for civil informing services	12,000	1.3%			
Production Stimulus	13,991	1.5%	20,366	2.6%	69%
Railway Subsidies	11,192	1.2%	15,620	2.0%	72%
Current Reserve	7,116	0.8%	17,246	2.2%	41%
BiH Federation Government	6,516	0.7%	15,800	2.0%	41%
Prime Minister and Deputy Prime Ministers Reserve	600	0.1%	1,446	0.2%	41%
Transfers of Capital			1,500	0.2%	
Transfers of capital for new formed municipalities			1,500	0.2%	
Servicing of the external debts	68,000	7.4%	42,173	5.4%	161%
Capital expenditure	13,714	1.5%	30,431	3.9%	45%
Custom-Buildings and the Government Build. in Mostar			5,040	0.6%	
Purchase of equipment for District Detention Centers			600	0.1%	
Purchase of equipment for Health care			1,000	0.1%	
Purchase of equipment for Parliament			277	0.0%	
Purchase of equipment for other beneficiaries	656	0.1%	1,268	0.2%	52%
Purchase of strategic Goods	3,731	0.4%	5,000	0.6%	75%
Reconstruction and road maintenance with investments	9,327	1.0%	17,246	2.2%	54%
Total expenditure	920,000	100%	779,674	100%	118%

Source: FBiH Ministry of Finance, OHR

Table 2.14 SARAJEVO CANTON BUDGET

	Year 1999		Year 1998		Growth
Revenue	000 KM	%	000 KM	%	99/98
Tax revenue	471,156	89.8%	510,441	92.0%	92%
Income tax	52,000	9.9%	54,001	9.7%	96%
Social and health insurance	99,571	19.0%	119,090	21.5%	84%
Income tax on salary	76,329	14.5%	90,200	16.3%	85%
Property tax	3,200	0.6%	20,200	3.6%	16%
Sales tax	240,056	45.7%	226,950	40.9%	106%
Non tax revenue and grants	38,500	7.3%	29,600	5.3%	130%
Capital undertaking fees	3,500	0.7%	5,500	1.0%	64%
Fines	35,000	6.7%	24,000	4.3%	146%
Grants			100	0.0%	
Surplus carried over from previous physical year	15,244	2.9%	14,864	2.7%	103%
Total revenue	524,900	100%	554,905	100%	95%
Expenditure					
Ministry, services, institutions	61,478	11.7%	49,579	9.1%	124%
Wages and contribution	41,863	8.0%	33,305	6.1%	126%
Gross wages	36,863	7.0%		0.0%	
Net wages		0.0%	18,154	3.3%	
Contribution to managers	5,000	1.0%	15,151	2.8%	33%
Costs for material, energy, maintaining and other services	19,615	3.7%	16,274	3.0%	121%
Current transfers	241,422	46.0%	221,761	40.7%	109%
Transfer to cities and municipalities	33,000	6.3%	28,000	5.1%	118%
Transfer to legal administration and communal public companies	30,597	5.8%	11,460	2.1%	267%
Transfer to legal administration	12,090	2.3%			
Transfer to communal public companies	18,507	3.5%			
Transfer to health	75,127	14.3%	82,000	15.0%	92%
Clinic center	37,526	7.1%	34,000	6.2%	110%
State hospitals	6,828	1.3%	7,500	1.4%	91%
Primary health protection	30,773	5.9%	40,500	7.4%	76%
Transfer of education	88,500	16.9%	85,000	15.6%	104%
Primary education	34,000	6.5%	30,070	5.5%	113%
Secondary education	26,000	5.0%	22,990	4.2%	113%
High education	27,000	5.1%	30,460	5.6%	89%
Science university	1,500	0.3%	1,480	0.3%	101%
Transfer of culture and sport	11,257	2.1%	12,585	2.3%	89%
Sport	1,270	0.2%	855	0.2%	149%
Culture	9,987	1.9%	11,730	2.2%	85%
Transfer to children protection	2,941	0.6%	2,716	0.5%	108%
Work and employment	300	0.1%	441	0.1%	68%
Social institutions	2,150	0.4%	1,800	0.3%	119%
Children institutions	491	0.1%	475	0.1%	103%
Capital investments	200,000	38.1%	271,365	49.8%	74%
Min. War Veteran Rights	11,000	2.1%	38,000	7.0%	29%
Min. Justice and Administration	1,850	0.4%	2,000	0.4%	93%
Min. Trade and Communication	27,800	5.3%	37,000	6.8%	75%
Min. Urban Planning & Communal Services	32,300	6.2%	55,865	10.3%	58%
Min. Urban Planning & Communal Services	28,500	5.4%			
Min. House Planning	3,800	0.7%			
Min. Interior	3,000	0.6%	5,000	0.9%	60%
Min. Economy	37,000	7.0%	70,200	12.9%	53%
Min. Reconstruction, Development and Environmental Protection	6,000	1.1%	6,500	1.2%	92%
Min. Health	21,000	4.0%	6,800	1.2%	309%
Min. Education, Science and Information	16,400	3.1%	10,000	1.8%	164%
Min. Culture and Sport	6,550	1.2%	5,000	0.9%	131%
Min. Labor, Social Welfare, Displaced Persons and Refugees	35,100	6.7%	35,000	6.4%	100%
Special service for common works	2,000	0.4%			
Political party	1,080	0.2%	2,200	0.4%	49%
Gradual uniting of the citizens	1,920	0.4%			
Reserve	6,000	1.1%			
Bank and credit	13,000	2.5%			
Total expenditure	524,900	100%	544,905	100%	96%
Surplus to be carried over to succeeding year	0		10,000		

Source: 1998 execution budget (Sarajevo Canton Gazette, July 1998)
1999 budget (Sarajevo Canton Gazette, March 1999)

Table 2.15 shows the comparison of economic power among BiH, FBiH, and Sarajevo Canton in the light of their financing capability for capital investment. It is noted that Sarajevo Canton has considerably high financing capability for its GDP size.

Table 2.15 FINANCING CAPABILITY OF SARAJEVO

	BiH	FBiH	Sarajevo	Sarajevo / FBiH
GDP (KM Million) *1	5,803	4,189	1,379	33%
Government budget (KM Million) *2	66	920	525	57%
Capital investment (KM Million) *2	0	14	200	1,428%

Source: FBiH Statistic Bureau, OHR
*1: Data of 1997
*2: Budget data of 1999

(4) Sarajevo Canton Communal Companies

Sarajevo Canton owns seven communal companies, one of which is ViK. Those communal companies cover wide range of public services such as provision of gas, cleaning of park, solid waste management, etc. In addition, Sarajevo Canton provides water supply and sewerage services in Municipalities Hadzici and Ilijas. The summaries of their operations and financial situations are presented in **Table 2.16**.

ViK is the biggest communal company in asset size. The assets are valued at more than KM 1 billion as of the end of 1998. In terms of revenue, ViK is the second biggest, generating KM 43 million. The company with the biggest revenue is Sarajevo Gas. This order is same in terms of loss. Sarajevo gas is the biggest loss maker, followed by ViK. Canton's capital expenditures for those communal companies amounted to KM 33 millions, out of which KM 24 million was earmarked for ViK. ViK is also dominant in receipt of donations from others. Combining Canton's expenditure and others' donation, ViK obtained about KM 38 million, which accounts for half of total capital investments spent for communal companies.

Table 2.16 COMPARISON OF CANTON COMPANIES

Major Results

Company	Revenue (000 KM)	Profit/Loss (000 KM)	Assets (000 KM)	Depreciation (000 KM)	Number of Employees	Economic Coefficient*
ViK	42,749	-30,197	1,187,107	35,855	1,070	0.43
Gas	60,275	-41,473	128,226	12,698	223	0.86
Heating	20,388	-6,083	81,526	1,821	336	0.56
Street Cleaning	26,655	248	36,671	1,947	917	0.99
Green Zone Environment	3,876	-17	13,782	132	164	0.41
Funeral Hall	4,168	425	4,077	308	96	1.12
Market Place	3,875	804	11,518	373	75	1.30
Hadzici Municipal Water	904	2	4,159	195	32	0.55
Ilijas Municipal Water	1,595	-205	5,276	399	45	0.70
Total / Average	164,486	-76,496	1,472,342	53,730	2,958	0.69

Source: Sarajevo Canton Company Data 1998

* Economic coefficient = (revenue without including subsidy / operating expenses excluding non cash item such as depreciation)
This is to indicate the level of operating revenue which has been generated by total operating cash expenses. The higher, the better.

Source of Capital Investment (000 KM)

Company	Canton's Expenditure	Loan	Donation from others	Own Funding	Total
ViK	24,000		11,630	2,000	37,630
Gas		6,392	815		7,208
Heating		13,132	1,708	521	15,360
Street Cleaning	8,412		2,330		11,564
Green Zone Environment	300		145		703
Funeral Hall					0
Market Place					1,202
Hadzici Municipal Water			28	17	45
Ilijas Municipal Water					0
Total	32,712	19,524	16,657	2,538	73,712

Structure of Assets (000 KM)

Company	Current Assets	Land	Building	Equipment	Other	Total Assets
ViK	16,700	1,289	1,138,945	29,705	462	1,187,101
Gas	41,171		64,850	20,772	1,434	128,226
Heating	9,005		60,961	2,066	9,493	81,526
Street Cleaning	7,509	2,140	16,418	10,560	45	36,671
Green Zone Environment	1,090	9,143	2,997	548	4	13,782
Funeral Hall	853	969	1,838	416		4,077
Market Place	109	330	9,886	1,142	51	11,518
Hadzici Municipal Water	477	2	3,429	250		4,159
Ilijas Municipal Water	595		4,352	324	4	5,276
Total	77,510	13,873	1,303,676	65,783	11,494	1,472,336

Major Components of Liabilities and Equity (000 KM)

Company	Suppliers	Short-term liabilities	Long-term liabilities	State capital	Share capital	Undistri-buted loss
ViK	68	2,386	1,842	1,014,482		
Gas	12,477	22,829	47,040	78,132		-41,474
Heating	9,921	1,982	29,656	43,689		-6,083
Street Cleaning	618	2,036	420	17,909		
Green Zone Environment	717	724		11,856		-17
Funeral Hall	104	613	229	1,562		
Market Place	289	104		3,860	4,885	
Hadzici Municipal Water	26	26		4,352		
Ilijas Municipal Water	11	40		4,420		-205
Total	24,229	30,741	79,186	1,180,263	4,885	-47,779

Source: Sarajevo Canton Company Data 1998

2.5.3 Privatization and Sector Reform

The FBiH authority has developed a comprehensive privatization program for enterprises and banks. The program includes (1) new laws on management of companies and privatization investment funds, (2) establishment of enterprise privatization agencies at all required levels, (3) privatization of most small enterprises, and (4) preparation for large enterprise privatization including pilot sales.

(1) Privatization of ViK

In accordance with the Law on Enterprises, The FBiH Government established the list of the enterprises and made the decision about the methods, time limits and competent agency for privatization. There are 158 enterprises in the list. Those included are 72 water companies, 2 electricity companies, 24 mining and forestry companies, traffic and transportation companies, 1 lottery company, and 37 mass communication companies.

72 water companies consist of ViK, 2 PCWAs, and 69 municipality-level water companies. Those companies have to be privatized by February 2001 through one of three methods, namely, (1) small-scale privatization, (2) tendering, and (3) public offering. In case that none of those three methods is successfully applied, other methods will be tried such as management contract, leasing, and concession.

Small-scale privatization is realized through public auction. Public auction is a method of sale via public competition where a winner is determined on the basis of highest price offered. In small-scale privatization, sellers can be enterprises with less than 50 employees and whose total assets are valued at less than KM 500,000.

Tendering, or public collection of bids is a method of sale that can be chosen if the price is not the most relevant factor. The winner or the best offer is selected on the basis of previously determined sale criteria such as, capital inflow, enterprise development, and employment increase.

In public offering of shares, state-owned capital in enterprises will be offered to citizens in exchange for their privatization certificates or cash. Privatization certificates and cash are equal means of payment in large-scale privatization. Other potential buyers can be all domestic and foreign individuals and legal entities, including privatization investment funds.

Management contract, leasing, and concession differ from the aforementioned methods in ownership of assets. Auction, tendering, and public offering allow private to own assets, while in management contract, leasing, and concession, the ownership of assets lies in public side.

As of August 1999, ViK has not decided yet which of the privatization methods should be taken. ViK can be considered either an integral enterprise or a combination of business units. When considered a combination of several business units, those units include (1) water supply operation, (2) sewer maintenance, (3) auxiliary or separable business such as restaurant, meter reading, and bill collection, and (4) wastewater treatment which has yet to be resumed. There exist various possibilities in applying most suitable methods of privatization, which are shown in **Table 2.17**.

Table 2.17 APPLICABLE PRIVATIZATION METHODS

	Small scale privatization (Auction)	Tendering	Public Offering	Management contract, Leasing, Concession,
①Water supply	Not possible	Possible	Possible	Possible
②Sewer maintenance	Not possible	Possible	Possible	Possible
③Auxiliary business	Possible	Possible	Not practical	Not practical
④WWTP	Not possible	Possible	Possible	Possible
⑤Overall business (=①+②+③+④)	Not possible	Possible	Possible	Possible

(2) Sector Reform

The International Community has been presenting several proposals to correct the current institutional, legal and financial set-up, and to strengthen the water sector of FBiH. The goals of institutional strengthening are protecting the water quality from pollution and preventing water shortages, which will lead BiH to the EU membership in the future. To this end, various efforts have been made so far and are still ongoing. The followings are major issues that are presently discussed in the context of sector reform.

- Possible creation of the Federal Ministry of Water Management and Environment --- which will combine components of environmental protection, water resources, and forestry that are currently divided between the Federal Ministry of Agriculture, Water Management and Forestry, and the Federal Ministry of Urban Planning and Environment.

- Possible reform of PCWAs --- Two PCWA's have been created on the basis of watershed area. It is pointed out that those PCWAs have incompatible and conflicting interests of responsibilities. A proposal for corrective measure is to reorganize PCWAs from the present watershed area management to the river basin management. Since FBiH has six river basins, there will be maximum 6 new PCWAs. The financing system of PCWAs is another concern. PCWAs have started collecting from water users, the special water fees for water abstraction and water protection. The financing by and the use of the water fees are required to be more transparent.