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NOTE

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Foreword

The Environmental Performance Reviews are intended to assist countries in transition to improve their management of the environment by establishing baseline conditions and making concrete recommendations for better policy implementation and performance and to integrate environmental policies into sectoral policies at the national level. Through the Peer Review process, they also promote dialogue among UNECE member countries and harmonization of environmental conditions and policies throughout the region.

This work was initiated by ministers at the second Ministerial Conference "Environment for Europe," in Lucerne, in 1993. Acting on the request of the ministers, the UNECE Committee on Environmental Policy, meeting in special session in January 1994, decided to make the Environmental Performance Reviews a part of its regular programme. As a voluntary exercise, the Environmental Performance Review is undertaken only at the request of the country itself at the ministerial level.

The studies are carried out by international teams of experts from the region, working closely with national experts from the reviewed country. Through a process of broad consultations, the experts carry out a comprehensive assessment of a wide range of issues related to the environment, covering three broad themes: the framework for environmental policy and management, management of pollution and natural resources and economic and sectoral integration. The team's final report contains recommendations for further improvement, taking into consideration the country's progress in the current transition period.

The teams also benefit from close cooperation with other organizations in the United Nations system, including the United Nations Development Programme, the United Nations Environment Programme, the World Bank and the World Health Organization.

This Environmental Performance Review is the fifteenth in the series published by the United Nations Economic Commission. I hope that this Review will be useful to all countries in the region, to intergovernmental and non-governmental organization and, especially, to Yugoslavia, to its Government, all national stakeholders, to its people.

Brigita Schmögnerova
Executive Secretary

Preface

The Environmental Performance Review (EPR) of Yugoslavia began with a preparatory mission in January 2002, when agreement was reached on both the structure and the organizational details of the project, taking into account, in particular, the considerable changes that the country had undergone during its ten-year isolation.

The review mission took place in April 2002. The review team included experts from Canada, Croatia, Denmark, France, Italy and Sweden, together with experts from the secretariat of the United Nations Economic Commission for Europe (UNECE), the United Nations Environment Programme (UNEP), the World Health Organization (WHO) and the World Bank. The draft was submitted for consideration to the EPR Expert Group of the UNECE Committee on Environmental Policy in October 2002. During this meeting, the Expert Group discussed the report in detail with representatives of Yugoslavia, focusing in particular on the conclusions and recommendations. The EPR report, as amended by the Expert Group, was then submitted for peer review to the UNECE Committee on Environmental Policy at its annual session in Geneva on 4-6 November 2002. A delegation consisting of high-level representatives of the Federal Government of Yugoslavia, and its constituent republics Serbia and Montenegro participated in the peer review. The Committee adopted the recommendations as set out in this report.

The Environmental Performance Review of Yugoslavia took place at a particularly interesting time in Yugoslavia. The Government was preparing new constitutions for the federation and the republics that would, inter alia, change their respective responsibilities. It was not within the competence of the EPR experts to anticipate decisions. Consequently, the review attempts to look at all relevant issues within the context of the Federal Government, Serbia and Montenegro, with recommendations addressed to each, as considered appropriate.

Kosovo and Metohija was also included in the review but has been presented in a separate section in deference to the special status accorded it by United Nations Security Council resolution 1244 of 10 June 1999, which authorizes the United Nations Interim Administration Mission in Kosovo (UNMIK) to, inter alia, "provide an interim administration for Kosovo under which the people of Kosovo can enjoy substantial autonomy within the Federal Republic of Yugoslavia, and which will provide transitional administration while establishing and overseeing the development of provisional democratic self-governing institutions to ensure conditions for a peaceful and normal life for all inhabitants of Kosovo."

The review of Yugoslavia's environmental performance is evidence of the efforts that the Government, at all levels, is making to improve environmental management, including by developing and implementing new legislation adapted to European standards. The EPR team, with the assistance of national experts, prepared an analysis and offered recommendations for future action in a number of areas, including the decision-making framework, economic instruments and financing, environmental information and public participation, management of waste, air quality, water, and mineral resources, agriculture and biodiversity, industry, energy, transport, sustainable tourism and human health.

The UNECE Committee on Environmental Policy and the UNECE review team would like to thank both the Government of Yugoslavia for its invitation to carry out this review and the many excellent local experts who worked with the international experts and contributed with their knowledge and assistance. UNECE wishes Yugoslavia and its constituent republics Serbia and Montenegro success in carrying out the tasks before them to meet their environmental objectives and policy, including implementation of the recommendations aiming to support and promote overall environmental protection and improve health and living standards.

UNECE would also like to express its appreciation to the Governments of Denmark, France, Germany, Italy, the Netherlands and Sweden for their support to the Environmental Performance Review Programme, to the United Nations Mission in Kosovo (UNMIK), United Nations Development Programme (UNDP) offices in Belgrade and Podgorica, to the UNEP Regional Office in Europe (ROE), and to the WHO European Centre for Environment and Health (ECEH) for their participation in the Yugoslav review mission and the preparation of this report. Special thanks also go to the World Bank, which was carrying out an Environment Sector Review in Yugoslavia, under the leadership of Mr. Arcadie Capcelea in parallel to the EPR mission. The World Bank team and the EPR team cooperated fully, and the World Bank provided its water expert to draft chapter 5 of this EPR.

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The preparatory mission for the project took place from 19 to 25 January 2002. The review mission was organized from 15 to 26 April 2002.

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ACRONYMS AND ABBREVIATIONS

BOD	Biological oxygen demand
CARDS	Community Assistance for Reconstruction, Development and Stabilization
CBD	Convention on Biological Diversity
CER	Centre for Ecotoxicological Research of Montenegro
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COD	Chemical oxygen demand
CPI	Consumer price index
DEM	Environmental Movement
DO	Dissolved oxygen
EAR	European Agency for Reconstruction
EBRD	European Investment Bank and European Bank for Reconstruction and Development
EC	European Commission
EDI	Eco-Development Initiative
EEA	European Environment Agency
EIA	Environmental impact assessment
EIONET	European Environment Information and Observation Network
EMEP	Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe
EPR	Environmental Performance Review
ERC	Environmental Resource Center
ESP	Electrostatic precipitator
EU	European Union
GDP	Gross domestic product
GEF	Global Environment Facility
GHG	Greenhouse gas
GIS	Geographic information system
GTZ	Gesellschaft für Technische Zusammenarbeit GmbH
HCFCs	Hydrochlorofluorocarbons
HESME	Health, Environment and Safety Management in Enterprises
HPP	Hydropower plant
IAEA	International Atomic Energy Agency
ICPDR	International Commission for the Protection of the Danube River
IFI	International financing institution
IMF	International Monetary Fund
IPPC	Integrated pollution prevention and control
ISDE	International Society of Doctors for the Environment
ISO	International Standardization Organization
IUCN	World Conservation Union
JICA	Japan International Cooperation Agency
LEAP	Local environmental action plan
LRTAP	Convention on Long-Range Transboundary Air Pollution
MAC	Maximum allowable concentration
MEA	Multilateral environmental agreement
NEAP	National Environmental Action Plan
NEHAP	National Environment and Health Action Plan
NGO	Non–governmental organization
NPZZS	National Environmental Protection Programme
ODS	Ozone-depleting substances
OECD	Organisation for Economic Co-operation and Development
OSCE	Organization for Security and Co-operation in Europe
PAH	Polyaromatic hydrocarbon
PCB	Polychlorinated biphenyl
PEBLDS	Pan-European Biological and Landscape Diversity Strategy
POP	Persistent organic pollutant

PPI	Producer price index
PWME	Public water management enterprise
REC	Regional Environmental Center
REReP	Regional Environmental Reconstruction Programme
RON	Research octane number
SAC	Special Area of Conservation
SCI	Site of Community Interest
SEA	Strategic environmental assessment
SECI	Southeast European Cooperation Initiative
SEEENN	South Eastern European Environmental NGOs Network
SoE	State of the Environment
SPM	Suspended particulate matter
UCTE	Union for the Co-ordination of Transmission of Electricity
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
UNIDO	United Nations Industrial Development Organization
UNMIK	United Nations Interim Administration Mission in Kosovo
USAID	United States Agency for International Development
VAT	Value-added tax
VOC	Volatile organic compound
WHO	World Health Organization
WUA	Water users associations

SIGNS AND MEASURES

..	not available
-	nil or negligible
.	decimal point
ha	hectare
kt	kiloton
g	gram
kg	kilogram
mg	milligram
mm	millimetre
cm^2	square centimetre
m^3	cubic metre
km	kilometre
km^2	square kilometre
toe	ton oil equivalent
l	litre
ml	millilitre
min	minute
s	second
m	metre
ºC	degree Celsius
GJ	gigajoule
kW_{el}	kilowatt (electric)
kW_{th}	kilowatt (thermal)
MW_{el}	megawatt (electric)
MW_{th}	megawatt (thermal)
MWh	megawatt-hour
GWh	gigawatt-hour
TWh	terawatt-hour
Bq	becquerel
Ci	curie
MSv	millisievert
Cap	capita
Eq	equivalent
H	hour
kv	kilovolt
MW	megawatt
Gcal	gigacalorie
Hz	hertz

Currency

Monetary unit: Yugoslavian Dinar

Exchange rates: UNECE

Year	Dinar/US$	Dinar/Euro
1995	..	..
1996	4.96	6.29
1997	5.70	6.46
1998	11.07	12.40
1999	22.84	24.37
2000	54.74	50.58
2001	67.67	60.61

Source: UNECE common statistical database, August 2002.
Note: Values are annual averages. Dinar/Euro rate is calculated using US$/Euro rates from the IMF IFS August 2002.

INTRODUCTION

I.1 The physical context

The Federal Republic of Yugoslavia (Yugoslavia) is located in south-eastern Europe in the heart of the Balkan Peninsula. Yugoslavia (102,173 km^2) consists of two republics, Serbia and Montenegro (Crna Gora). Serbia is considerably larger (88,361 km^2) than Montenegro (13,812 km^2) and covers 85% of the total land area of Yugoslavia. Within Serbia there are two semi-autonomous provinces, Vojvodina (21,506 km^2) in the north and Kosovo and Metohija (10,887 km^2) in the south.

The country is bounded by the Adriatic Sea, with 199 kilometres of coastline, and seven countries, with 2,246 km of land borders. Albania lies to the southwest (border 287 km), Bosnia and Herzegovina to the west (527 km), Croatia to the northwest (266 km), Hungary to the north (151 km), Romania (476 km) and Bulgaria (318 km) to the east and the former Yugoslav Republic of Macedonia (221 km) to the southeast.

Serbia has four main regions. In the north lies Vojvodina, part of the Pannonian Plain, a fertile area drained by the Danube, Sava, Tisza, and Morava rivers; the central Serbian Sumadija area is hilly and heavily populated; in the south is the autonomous province of Kosovo and Metohija, a mountainous area dominated by the Dinaric Alps, and finally, in the southeast, are the Balkan Mountains.

The Danube, which is the second longest river in Europe (total length 2,850 km) and the only major European river to flow from west to east, is one of the principal transport arteries on the continent, flowing 588 km within Yugoslavia. It crosses the Vojvodina region through the Pannonian Plain, runs through the capital Belgrade and exits the country through the Balkan Mountains, at the Iron Gate gorge, finally flowing into the Black Sea.

The navigable rivers Sava (length 206 km in Yugoslavia), Drina (length 220 km in Yugoslavia) and Morava (length 308 km, all in Yugoslavia) with the Danube form the main water resources of the country. The Danube river basin alone covers 87% of the country's territory. The annual per capita water flow is about 1600 m^3 making Yugoslavia a water-poor area (less than 3,000 m^3/capita is water-poor). Furthermore, the water flow varies seasonally, which has required the construction of reservoirs on the Drina, Danube and Lim rivers. The country's largest lake is Skadarsko Jezero (Lake Scutari) (area 369.7 km^2) on the Montenegrin-Albanian border.

Montenegro is divided into three regions. The Adriatic coast and lowlands in the southwest are separated from the rest of the country by mountains. Skadarsko Jezero, and the Zeta and lower Moraca rivers are situated on the central lowland plain. The inland mountain region dominates Montenegro in the west.

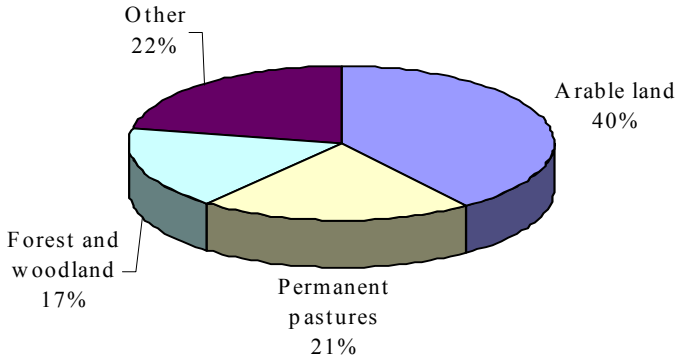
Yugoslavia has several mountain ranges and its topography is dotted with high mountain peaks, including 45 peaks higher than 2,000 m. The highest is the 2,656-metre-high Djeravica in Serbia in the Prokletije mountain range on the boundary between Yugoslavia and Albania.

The northern part of Yugoslavia has a moderate and continental climate while a Mediterranean-Adriatic climate prevails along the coast. Rainfall increases with distance from the coast, which has an average annual precipitation of 1,000 mm to 1,500 mm, while the mountain slopes receive 1,500 rising to a maximum of 5,000 mm on the higher peaks further inland. The average temperature ranges inland from 18 to 19° C in July to 2 to 3° C in January, while in the coastal area it ranges from 23 to 26° C in July to 5° C in January.

Forests and woodland cover 17% of the country, and 40% is arable land. Twenty-one per cent is used as permanent pastures and 22% is used for other purposes.

In 2000, the agricultural sector produced 21.1% of gross domestic product (GDP). The Vojvodina region contains the most fertile agricultural land. The main agricultural products are maize, sugar beet, tobacco, wheat and potatoes.

Figure I.1: Land use in Yugoslavia, 1998 (estimate)



Source: CIA factbook, 2002 (data 1998 estimated).

Total electricity output in 1999 was 34.5 billion kWh, of which 30% was produced by hydroelectric power stations. Yugoslavia has its own oil and gas reserves, and, in 1998, one third of the country's oil demand and a quarter of gas demand were produced locally.

The country is rich in mineral resources. Before 1999 it was self-sufficient in coal, and it also has large lead and antimony deposits. Some of Europe's largest copper ore reserves are located in Serbia.

I.2 The Human context

Serbia's estimated 2002 population is 9,979,752. In the mid-1990s ethnic Serbs constituted approximately two thirds of the population. Albanians, the largest minority group, represented 17% of inhabitants, and the rest of the population was made up of ethnic Hungarians, Muslims, and citizens of mixed ethnicity. However, the population of Kosovo and Metohija is more than 90% Albanian, and Vojvodina has a large Hungarian minority. Most of the Croats who formerly lived in Vojvodina and Belgrade fled after hostilities broke out between Croats and Serbs in 1991. Other, small, ethnic minorities are Slovaks, Ukrainians, Czechs, Poles, Russians, Romanians and Germans.

In 2002 Montenegro had a population of 677,177. More than 60% of its people are of Montenegrin ethnicity; the main minorities are ethnic Muslims (about 15%), Serbs (about 9%) and Albanians (about 7%).

In 2000, 52% of the population lived in urban areas. The main cities are Belgrade, the federal capital and the capital of Serbia (pop. 1,168,500); Novi Sad, a commercial centre (179,600); Nis, a transport and industrial centre (175,400); Kragujevac, a manufacturing centre (147,300); and Podgorica, the capital of Montenegro (117,000). The average population density of 103 inhabitants/km^2 is slightly lower than the EU average of 114 inhabitants/km^2.

The country's total fertility rate decreased from 2.1 (per 1000) in 1990 to 1.7 in 1999, but it is still higher than the European average of 1.4. The birth rate decreased from 14.7 (per 1000) in 1990 to 11.7 in 1999. The average population of Yugoslavia has been surprisingly steady since 1990, when the population was 10.5 million. The total population changes are insignificant compared to the huge population movements within the former Yugoslav area due to the conflicts. As a result of the wars following the collapse of the former Yugoslavia, approximately 646,000 refugees fled to Serbia and Montenegro from Croatia and Bosnia and Herzegovina. Many of them settled in Belgrade or Serbia's northern province of Vojvodina.

Surprisingly, wars and the deteriorating economic situation have not negatively affected infant mortality. Quite the contrary, in the past ten years there has been a significant decline in infant mortality as the rate fell from 22.8 infant deaths (per 1000 live births) in 1990 to 13.9 in 1998. Average life expectancy at birth in 1998 was 72.6 years (75.1 years for women and 70.2 for men).

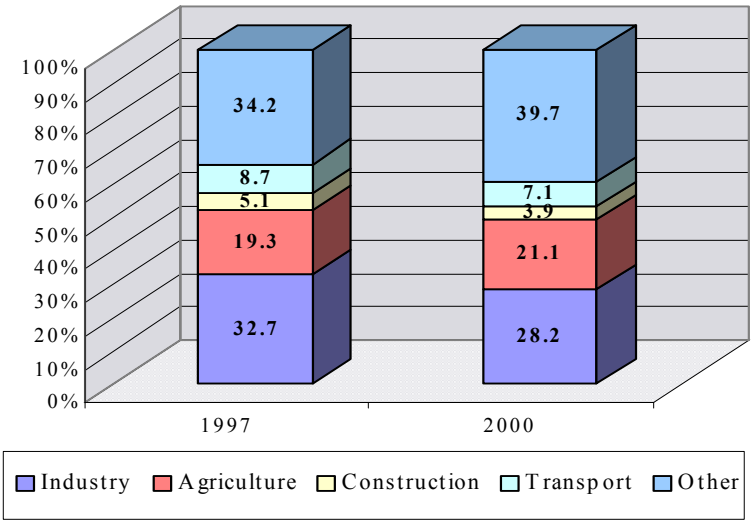
In 1992, the country's human development index (HDI) was 0.857 (on a scale of 0.0 to 1.0). Then Yugoslavia ranked 37th among the 160 countries reviewed. Since then its ranking has decreased, and the latest available HDI, for 1996, placed

Yugoslavia 87th among the 174 countries reviewed, with an HDI of 0.725.

The country's literacy rate in 1999 was 91% and the attainment quotient of post-secondary or tertiary education for adults aged 25 years and older in 1990 was 5.7%.

The official language of the whole country (both Serbia and Montenegro) is Serbian. Mainly written in the Cyrillic alphabet, it is one of two main forms of the Serbo-Croatian language mutually understandable for Serbs and Croats. The minorities speak their own languages, such as Albanian and Hungarian.

Figure I.2: GDP - composition by sector: 1997 and 2000 (per cent of total GDP)



Source : UNECE common statistical database, 2002.
Note : No earlier data available from ECE/STATS.

Table I.1: Living standard indicators, 1990-2000

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Basic telephone lines (per 1000 inhabitants)	166	172	180	182	188	192	197	206	218	214	..
Mobile telephone subscribers (per 1000 inhabitants)	..	..	..	..	..	..	1	8	23	57	..
Internet hosts	2	9	11	2	..	..	2,535	4,897	7,712	10,544	..
Estimated Internet users (in thousands)	..	..	..	..	..	..	20	50	65	80	..

Source : ITU. Yearbook of Statistics 2001.

Table I.2: Demography and health indices, 1990-2000

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Birth rate (per 1000)	14.7	14.6	13.5	13.5	13.1	13.3	13.1	12.4	12.1	11.7	..
Fertility rate (per 1000)	2.1	2.1	1.9	1.9	..	1.9	1.8	1.8	1.7	..	..
Mortality rate (per 1000)	9.3	9.8	10.1	10.2	10.0	10.2	10.6	10.6	10.7	..	..
Infant mortality rate (per 1000)	22.8	21.0	21.8	21.9	18.4	16.9	15.0	14.3	13.9	..	..
										..	
Female life expectancy at birth (years)	74.9	74.9	74.6	74.3	..	74.9	74.7	75.0	75.1	..	..
Male life expectancy at birth (years)	69.6	68.8	68.8	69.2	..	70.3	70.1	70.1	70.2	..	..
Life expectancy at birth (years)	72.3	71.8	71.6	71.7	..	72.6	72.4	72.5	72.6	..	..
Population aged 1-14 in total (%)	23.0	23.4	22.5	22.1	..	21.5	21.2	21.0	20.6	20.3	19.9
Population aged 65 or over in total (%)	9.9	9.9	11.0	11.4	..	12.2	12.5	12.8	13.2	13.5	13.7

Sources : UNECE PAU 2002, CIA Factbook 2001, WHO Health for all Database.

Figure I.3: Map of the Federal Republic of Yugoslavia

I.3 The economic context

Estimating and analysing the economic performance of any country involved in the type of prolonged conflict that took place in Yugoslavia is extremely complicated. A war economy is linked with the destruction of property, population movements, growth of the grey economy and general lawlessness and a lack of documentation on economic transactions. Therefore, it is hard to compile reliable statistics.

The break-up of the Yugoslav Federation in 1991 led to destructive warfare, causing the destabilization of internal boundaries, and the disruption of important intra-Yugoslav trade flows. The country's GDP started to fall in 1990 and lost 20% in two years. In the following two-year period, 1992-1993, the country lost half of its remaining GDP, and, in 1993, GDP decreased to 40% of the 1989 figure. Since then GDP has increased, but in 2001 it is still less than 50% of the 1989 level.

The former Yugoslav republics had been interdependent for large amounts of energy and manufacturing. This interdependence was strengthened by the differences in climate, mineral resources, agricultural production and levels of technology and wealth among them. Much of the industrial output was concentrated in a small number of giant plants, and the break-up of trade links led to a sharp drop in output as the industrial plants lost suppliers and markets. The destruction of physical assets during the fighting also contributed to the economic difficulties of the republics.

Yugoslavia's annual inflation as measured by the consumer price index (CPI) shot up to 122% in 1991 and to 8,926% in 1992. Hyperinflation ended with the establishment of a new currency unit in June 1994, and prices stayed relatively stable from 1995 to 1997, but inflationary pressures resurged in 1998. The CPI rose from 21.6% in 1997 to 89.2% in 2001.

The sanctions imposed on Yugoslavia in 1992 by the international community were damaging for the whole economy, and high hopes were attached to their suspension. The economic boom anticipated by the Government after the suspension of United Nations sanctions in December 1995 failed to materialize. GDP growth between 1995 and 1998 was insignificant and the already high registered unemployment figure continued upward. Unemployment had been at a very high 21% already in 1991, and over the years it gradually increased to 27.9% in 2001. It should be noted that it was only in November 2000 and January 2001 respectively that EU and United States sanctions against Yugoslavia were lifted.

Continuous wars and conflicts over a ten-year period and the poor management of the economy and the environment are largely to blame for the economic hardship of the country. All sanctions have now been lifted and Yugoslavia is in the first stage of economic reform. It has been re-admitted to the United Nations, and it became a member of the World Bank in May 2001.

I.4 The institutions

On 27 April 1992, Serbia and Montenegro established the Federal Republic of Yugoslavia. A new constitution with a federal president and a federal assembly was adopted. The head of State is the Federal President, elected by popular vote for a maximum of two terms. The President can dissolve the Assembly at the request of the Prime Minister. The Government is composed of the Prime Minister and the Cabinet with executive duties. There is a bicameral Federal Assembly with two chambers: a Chamber of Republics, composed of 20 representatives from each republic, and a Chamber of Citizens, composed of one federal deputy for approximately 65,000 citizens.

At present each of the constituent republics, Serbia and Montenegro, has its own government, with legislative, judicial and executive branches. At local level Serbia is divided into 29 districts and Montenegro has 21 municipalities, with directly elected assemblies.

On 14 March 2002, the Yugoslav Government and the respective national assemblies of Serbia and Montenegro adopted "The Agreement on Principles of Relations between Serbia and Montenegro" defining the relations within the Yugoslav State union. A constitutional commission is drafting the new constitutional charter for the State that will be called the Union of Serbia and Montenegro. This constitutional charter must then be adopted by the republics' assemblies and submitted to the Federal Assembly for adoption before entering into force. Signatories have the right to withdraw from the union during a three-year reconsideration period.

Table I.3: Selected economic indicators, 1994-2001

	1994	1995	1996	1997	1998	1999	2000	Estim. 2001
GDP (change, 1989=100)	41.7	44.2	46.8	50.3	51.5	42.4	45.1	47.9
GDP (% change over previous year)	2.5	6.1	5.9	7.4	2.5	-17.7	6.4	6.2
GDP in current prices (million dinar)	23,884	43,984	79,396	112,355	154,584	196,516	358,100	699,600
GDP in current prices (billion US$)	15.4	12.6	14.5	16.6	13.9	10.2	8.1	10.5
GDP per capita (US$ PPP per capita)	..	..	..	..	..	..	..	..
Share of agriculture in GDP (%)	..	..	..	19.3	18.4	20.6	21.1	..
Industrial output (% change over previous year)	1.3	3.8	7.5	9.5	3.6	-23.1	11.2	0.0
Agricultural output (% change over previous year)	6.0	4.2	1.0	7.0	-3.0	-1.0	-13.0	23.0
Labour productivity in industry (% change over previous year)	4.1	6.5	10.0	13.0	7.2	-14.5	15.1	..
CPI (% change over the preceding year, annual average)	3.3	78.6	91.5	21.6	29.9	44.9	85.6	89.2
PPI (% change over the preceding year, annual average)	..	57.7	90.1	19.5	25.5	44.2	106.5	85.1
Registered unemployment (% of labour force, end of period)	23.9	24.7	26.1	25.6	27.2	27.4	26.6	27.9
Balance of trade in goods and non-factor services (million US$)	-400	-1,018	-2,060	-2,070	-1,736	-1,619	-1,788	-2,710
Current account balance (million US$)	-400	-1,037	-600	-1,279	-580	-764	-339	-700
" " (as % of GDP)	..	..	..	..	..	..	..	..
Net FDI inflows (million US$)	..	..	0	740	113	112	25	90
Net FDI flows (as % of GDP)	..	..	..	..	..	..	..	..
Cumulative FDI (million US$)	0	0	0	740	853	965	990	1,080
Foreign exchange reserves (million US$)	200	260	306	288	173	128	355	850
(as months of imports)	..	..	..	..	..	..	..	..
Total net external debt (million US$)	..	..	..	..	..	..	..	..
Exports of goods (million US$)	1,500	1,360	2,042	2,758	2,996	1,676	1,923	2,130
Imports of goods (million US$)	1,900	2,378	4,102	4,828	4,732	3,295	3,711	4,840
Ratio of net debt to exports (%) (calc)	..	..	..	..	..	..	..	..
Ratio of gross debt to GDP (%)	..	..	..	..	..	..	..	..
Exchange rates: annual averages (dinar/ US$)			5.0	5.7	9.2	10.9	16.1	..
Population (1000)	10,516	10,547	10,577	10,597	10,617	10,629	10,641	..

Source: UNECE Common statistical database and National Statistics.

Notes: As from 1998 Kosovo and Metohija data are excluded from Yugoslavia's data.

The new parliament will be unicameral and will elect the head of State, who will be a president. The council of ministers will have only five departments: foreign affairs, defence, international economic relations, internal economic relations, and the protection of human and minority rights.

The court of Serbia and Montenegro will have constitutional and administrative functions, and will deal with harmonization of court practices. It is not an appellate court.

Serbia and Montenegro will amend their respective constitutions in compliance with the constitutional charter of Serbia and Montenegro or promulgate new constitutions by the end of 2002.

I.5 Environmental context

Industrialization of the country, especially after the Second World War, increased pollution levels and contributed to environmental degradation. Natural resources were exploited freely and industrial effluents were not treated appropriately. As Yugoslavia was absorbed in the war in the early 1990s, environmental issues were largely ignored. The international embargo put pressure on the country's natural resources and pollution, worsened by outdated technologies, went largely unchecked.

However, the weak economic performance also had a favourable effect on the environment. The decline in general economic activity between 1990 and 1999 reduced pollution and the pressure on the environment. Emissions of pollutants fell between 1990 and 1997.

Due to erosion, opencast mining and waste disposal, about 20% of Yugoslavia's land area could be classified as degraded. Water-related problems are due to rapid industrialization, increased urbanization and pressures caused by agriculture. In the mid-1990s less than 10% of the country's waste water was treated before being released into rivers and lakes, and deforestation accelerated.

Thermal power plants and heating facilities produce about 40% of the air pollution. The use of low-quality coal (lignite) causes most of the air pollution. The lack of emission control and inadequate maintenance of the facilities aggravate the situation. The quality of air also suffers from the ageing fleet of motor vehicles and the mainly leaded, low-quality fuel. Old and environmentally unsound technologies, poor technological discipline and a low waste utilization rate are contributing factors to industrial pollution.

Yugoslavia's climate and geographic position have created a rich biodiversity of plant and animal species. According to the World Conservation Union (IUCN), Yugoslavia is one of the six main European centres of biological diversity ranking third in Europe with its number of species per square kilometre. To preserve the natural diversity, 4% of the country's territory is protected, including eight internationally protected areas, nine national parks (five in Serbia and four in Montenegro) and sixteen regional natural parks.

PART I: THE FRAMEWORK FOR ENVIRONMENTAL POLICY AND MANAGEMENT

Chapter 1

DECISION-MAKING FRAMEWORK FOR ENVIRONMENTAL PROTECTION

1.1 Introduction

Yugoslavia has inherited a reasonably well developed environmental management system compared to that in many other countries in transition. Until the end of the 1980s, the Federal Socialist Republic invested around 1% of its GDP in environmental protection. However, due to the wars and the subsequent sanctions, the environmental management system was disrupted for almost ten years. Since 2000, there have been clear indications of an increasing political interest in the environment. Plans for the development of a national environmental action plan (NEAP) are being negotiated with the World Bank and this Environmental Performance Review has been undertaken as part of the "Environment for Europe" process. These efforts reflect Yugoslavia's commitment to become a full member of the international environmental community.

On 12 July 2002, the Serbian Ministry for Protection of Natural Resources and Environment and the Montenegrin Ministry of Environmental Protection and Physical Planning agreed to cooperate on environmental protection and to establish a coordinating body to carry out joint environmental activities. The coordinating body would meet not less than once a month to share information and arrange for joint action and approaches to environmental protection. It is also foreseen that this coordinating body would cooperate with the federal institution(s) responsible for environmental protection, without prejudice to the outcome of the process of drafting a new constitution.

For the time being, the agreement to establish a coordinating body is considered an acceptable solution for both Serbia and Montenegro for the implementation of international agreements on environmental protection, a more efficient approach to foreign donors and the tasks of stabilization and association with the EU and linking with the European Environment Agency (EEA). The coordinating body would function as a formal focal point, while the mechanism of rotating its representatives would provide direct representation and protection of the interests of Serbia and Montenegro. It is also understood that this will depend on the final agreement to be reached among Yugoslavia, Serbia and Montenegro.

1.2 Yugoslavia

The institutional framework

Environmental responsibilities have been divided among the federal State, the constituent republics and the municipalities. The federal competences are laid down in the Yugoslavia's 1992 Constitution and in the various environmental laws. These competences are primarily aimed at transboundary and international issues. Until October 2000, environmental issues were dealt with at ministerial level by the Federal Ministry for Science, Development and Environment. After reforms reducing the number of ministries from 17 to 10, the Federal Secretariat for Labour, Health and Social Care, through its Environment Department, became responsible for the basis environmental issues at the federal level.

Yugoslavia is organized according to a 'double track' system, whereby the federal State and each constituent republic has its own constitution. Environmental protection is part of the responsibilities of the federal State. It should formulate policy, enact and enforce federal legislation, other laws and general enactments and ensure judicial protection. Among the issues that will be addressed through the adoption of the new constitutional charter are the respective constitutional competencies in the following areas: (i) the atmosphere and watercourses of international interest and international waters and the territorial waters with reference to international relations; (ii) foreign trade and customs regimes and the basic principles of the fiscal system; (iii) scientific research and development, and regional development; (iv) safety in all types of transport

and the basis of the real estate system; (v) international relations; (vi) defence and security; and (vii) the protection of human life and health against contagious diseases that threaten the country as a whole; the manufacture and sale of medicines; the protection of animals against contagious diseases and the protection of plants against diseases and pests that threaten the country as a whole; the sale of chemicals for plant and animal protection and the control of animals and plants crossing State frontiers; genetic material in agriculture and forestry; protection against ionizing radiation; the production, sale and transport of weapons and of toxic, inflammable, explosive, radioactive and other dangerous substances (art. 77, paras. 2-8).

The republics enjoy considerable autonomy and the federal State does not have supervisory competencies over their environmental authorities. De facto this has major implications for the implementation of international (environmental) agreements. The federal State is the entity with legal authority and responsibility for international agreements, but it does not have sufficient legal competence to guarantee their implementation. Federal laws on the ratification of international environmental agreements are implemented through both federal and republican legislation. Therefore, ongoing negotiations are taking place to clarify the current and future role of the federal State and the two constituent republics in the signing and implementation of international agreements and the future Union of Serbia and Montenegro. The implications for the approximation of legislation to European Union legislation pose additional challenges to the judicial organization of the federal State and the member republics (see chapter 4, on International cooperation).

Federal policies and strategies

Policies and strategies are a key element of a country's environmental management system. An environmental policy should set priorities and provide strategic, long-term directions. The federal State has developed the following three key policy documents:

- The Resolution on Environmental Policy (1993);
- The Resolution on Biodiversity Protection (1993); and
- The Medium-term Economic Recovery and Transition Programme (2001).

The Resolution on Environmental Policy outlines 12 programmes and 49 priority measures to be reviewed and adopted every five years. In 1998, the Law on the Basic Principles of Environmental Protection (No. 24/98) provided an instrument to implement this Resolution. The programmes, focusing on water, air, forests, soil, natural heritage, biodiversity, waste, hazardous substances, ionizing radiation, regional planning, town planning, architectural heritage, and noise, mainly call for the drafting of more specific policies for each one. Specific targets were set for a number of programmes, for example to solve the problem of the temporary storage of radioactive waste by 2015.

The Resolution on Biodiversity Protection sets out the goals and principles of biodiversity protection and includes four programmes to achieve them, including a monitoring programme and a programme to identify processes and activities with a negative influence on biodiversity (see also chapter 9, on biodiversity conservation and nature protection).

The most recent policy statement, "Breaking With the Past: The Path to Stability and Growth", was prepared for a donors' conference organized by the World Bank and the European Commission in June 2001. Chapter 12 is dedicated to the environment and proposes an environmental agenda based upon approximation to the body of environmental laws of the European Union. It sets both short- and long-term goals. The near-term goals are accompanied by the following key actions:

- Strengthening capacity for the enforcement of environmental impact assessment and pollution permits and
- Restoring and strengthening the environmental monitoring and information system.

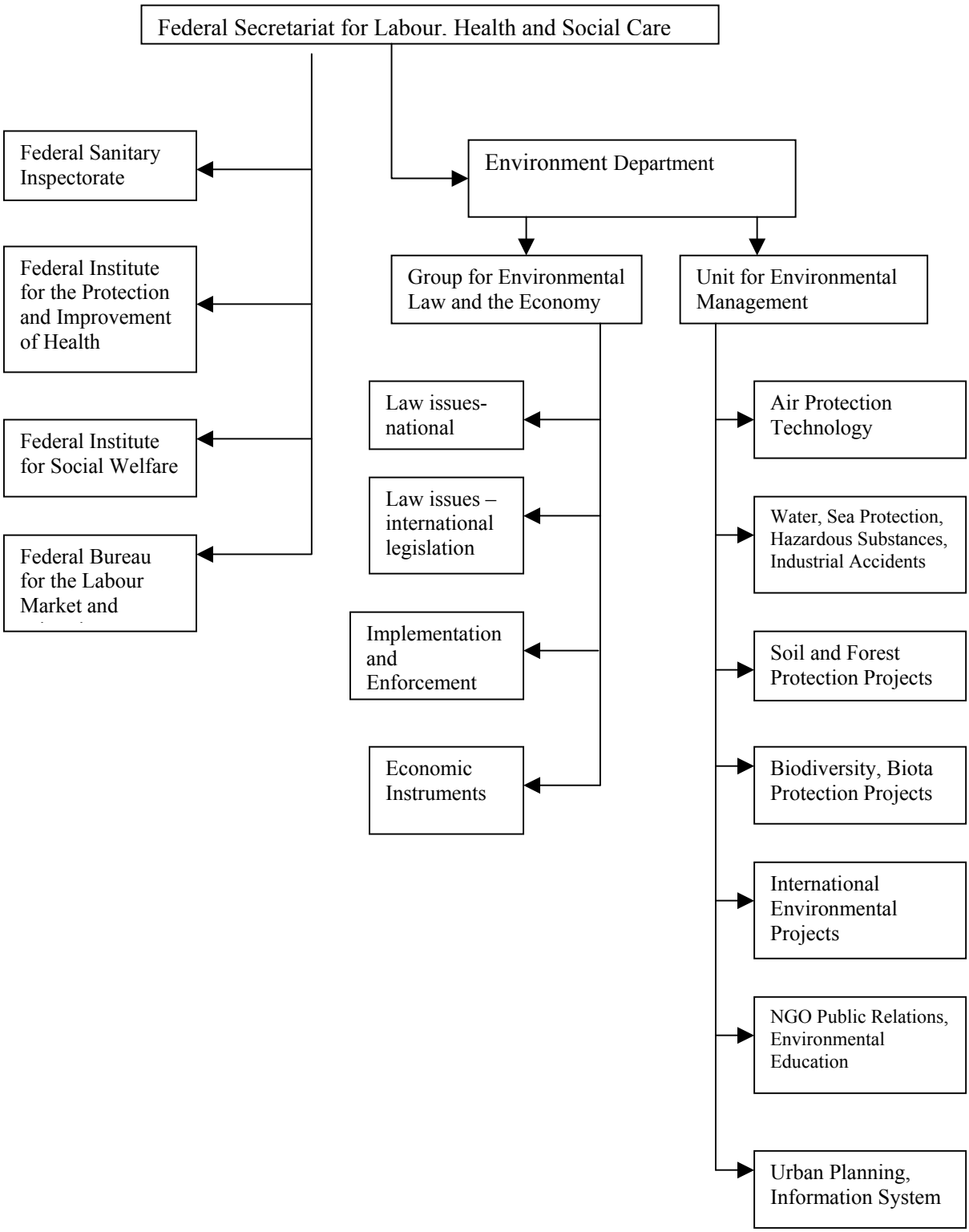
The legal framework of Yugoslavia

The legal framework is well developed, and there is a wide range of laws and regulations in Yugoslavia. There are over 150 laws and 100 regulations at both federal and republican levels. The most important federal law is the 1998 Law on the Basic Principles of Environmental Protection. This law lays down the basic principles for sustainable development, integrated pollution control, polluter pays and user liability and public participation. It also describes the main federal competences, including:

- Environmental impact assessment with transboundary effects;

- Protection from substances which deplete the ozone layer;
- The import, export and transit of waste;
- The import, export and transit of endangered species of wild fauna and flora;
- Industrial accidents in a transboundary context;
- Financing;
- Monitoring, inspection and enforcement; and
- Liability for environmental damage.

Figure 1.1: Federal Secretariat for Labour, Health and Social Care



The Federal Secretariat for Labour, Health and Social Care, and in particular its Environment Department, is responsible for the implementation of this Law. This takes place mainly through the issuance of import and export permits for waste and endangered species and sharing of information on transboundary environmental impacts. However, border inspection has not yet been established.

Yugoslavia has not signed the United Nations Economic Commission for Europe's Convention on Environmental Impact Assessment in a Transboundary Context (Espoo, 1991). As for the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989), the federal State provides permits for the import, export and transit of hazardous waste. However, at the republican level, from September 2002, in Serbia, the internal transport of hazardous waste and radioactive substances are under the competencies of the Ministry for Protection of Natural Resources and Environment Under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the federal State provides permits for the import, export and transit of endangered species.

The Law on Hydrometeorological Affairs of Interest to the Country (Nos. 18/88 and 63/90) regulates mainly the atmosphere, the monitoring of air, water pollution and radioactivity, the collection and haring of data, and the hydrometeorological information system. The Federal Hydrometeorological Institute and the republics' hydrometeorological institutes are competent for the implementation of this Law.

The Law on the Water Regime (No. 59/98) regulates the regime of watercourses of international interest and international waters, emissions and water quality, monitoring and supervision. Emission and water quality standards have not been adopted. The Federal Ministry of the Economy, through its Department for Water Resources, and the Federal Hydrometeorological Institute are competent for the implementation of this Law (see chapter 5, on water management).

Other relevant federal laws include:

- The Law on the Transport of Hazardous Substances (Nos. 27/90, 45/90, 24/94, 28/96 and 21/99). This Law lays down the conditions for the transport of hazardous substances, transport safety measures, permits for the export, import and transit of hazardous substances, and border inspections. The competent authorities for this Law are the Department of Health of the Federal Secretariat for Labour, Health and Social Care, the Federal Ministry of Internal Affairs and the Federal Ministry of Transport (see chapter 13, on transport and the environment);

- The Law on the Production of and Trade in Poisonous Substances (No. 15/95). This Law stipulates the conditions for the production of and trade in poisonous substances, categories of poisons, their packing, trading and use, the removal of poison residues, and border inspection. The Department of Health of the Federal Secretariat for Labour, Health and Social Care is responsible for the implementation of this Law;

- The Law on Protection against Ionizing Radiation (No. 46/96). This Law stipulates general measures of protection, particularly safety measures, for nuclear structures and substances, and for their import, export and transit, and border inspection. The Federal Ministry of the Economy and the Department of Health of the Federal Secretariat for Labour, Health and Social Care are the competent authorities for this Law;

- The Law on Foreign Trade (Nos. 46/92, 16/93 and 24/94) contains provisions related to the environment (import, export and transit of hazardous substances);

- The Law on Standardization (No. 30/96) requires standards and technical regulations for the protection of human life, health and environment. The competent authority for the implementation of this law is the federal Institute for Standardization; and

- The Customs Act (No. 45/92) and related regulations contain provisions on customs supervision and procedures concerning goods harmful or dangerous for the environment. The Federal Secretariat for Labour, Health and Social Care's Environment Department is the competent authority for matters concerning the environment.

Although it is the intention of the federal Government to approximate its environmental legislation with that of the European Union, no comparative analysis of existing national legislation

has yet taken place. The Federal Secretariat for Labour, Health and Social Care is, however, fully aware of the challenge.

1.3 Serbia

According to its Constitution, Serbia has competence for "the system for environmental protection and advancement and the protection and promotion of plants and animals". Until recently the competent authority for environmental issues was the Directorate for Environmental Protection of the Serbian Ministry for Health and Environmental Protection. In May 2002, Serbia's National Assembly adopted the Law on Ministries and thereby established the Ministry for Protection of Natural Resources and Environment. Its organizational structure is still being developed. The competences of this new Ministry are discussed below in the section on the institutional framework.

The passing of the Law on the Transmission of Competences from the Republic to the autonomous Provinces-Vojvodina in 2002 (No. 6/2002) was accompanied by, inter alia, a decentralization of environmental competences. The province of Vojvodina can now, through its own bodies, and in accordance with Serbian environmental legislation, adopt programmes for environmental protection, and establish an institute for nature protection and public enterprises. It can also consent to environmental impact assessments for construction permits for which the province is the competent authority. It will be responsible for the implementation of environmental programmes, which will require regular monitoring and inspections of each environmental issue, except for hazardous substances and the protection of biodiversity.

The policy framework

In 2001, the Government of Serbia approved its first State-of-the-Environment report covering the year 2000. This report is translated into English. According to Serbia's Constitution, the Government has to formulate policies. To date, no environmental policy has been developed. In 2001 the National Assembly adopted the following priorities based upon the State-of-the-Environment report and set by the Ministry of Health and Environment Protection:

- The building and reinforcing of environmental protection institutions and services. This includes cooperation between the environment and other sectors;
- The adoption of a framework law on environmental protection and the design and implementation of new environmental strategies, e.g. a waste management strategy, a national environmental action plan, a local environmental action plans and strategies for the sustainable use of natural resources and protected areas;
- Accidental response system development;
- The cleaning-up of environmental hot spot;
- A commitment to regional cooperation and environmental legal reform (EU accession, economic reform); and
- The development of an integral environmental information system (public awareness, civil society building, environmental education).

The World Bank is preparing an environment sector review for Yugoslavia. As part of this review, the Ministry for Protection of Natural Resources and Environment has expressed interest in receiving assistance for the development of a national environmental action plan.

There is no legal obligation for municipalities to develop local environmental action plans (LEAP). The country office of the Regional Environmental Center for Central and Eastern Europe (REC) is running a project with ten municipalities to develop such a plan. The municipality of Nis delivered the first LEAP in December 2001 and the second – in the municipality of Subotica – is expected in the middle of 2002. To assist the municipalities in developing their LEAPs, the REC country office, with support from the Government of the Netherlands, translated and distributed the Institute for Sustainable Development's LEAP manual for local communities.

The legal framework

The Law on Environmental Protection (Nos. 66/91, 83/92, 67/93, 48/94 and 53/95) is the most important piece of environmental legislation in Serbia. This comprehensive Law regulates the system of protection and development of the environment, including spatial planning, environmental impact assessment and construction. It contains paragraphs on the protection of air, water, land, flora and fauna, natural resources, noise, ionizing radiation, waste and hazardous materials. It also contains special sections on financing, inspections and sanctions. The Law on

Environmental Protection forbids the pollution of natural resources. However, the protection of various media is divided amongst various institutions, and the Ministry for Protection of Natural Resources and Environment does not have full competence for implementing this Law (e.g. soil, water).

In order to approximate the European Union's body of environmental law and introduce other international standards, a new environmental law was developed in 2001 as part of the Regional Environmental Reconstruction Programme for South and Eastern Europe (REReP), with strong support from the Organisation for Security and Cooperation in Europe (OSCE). The first draft of the law on the environmental protection system was drawn up with expertise from national experts and a number of international organizations. In September 2001, it underwent an extensive public participation process. It was open for discussion in approximately 30 public hearings and it was submitted to 160 local communities for comment. An awareness-raising media campaign was also launched. In April 2002 the draft was finalized and submitted to the National Assembly, which is expected to consider it in October 2002.

The draft law on the environmental protection system prescribes the issuance of environmental permits including conditions for natural resource use and an environmental impact assessment permit. In addition, the new Ministry will be assisted by an environmental protection agency responsible for the implementation of the law.

Other important environmental laws and regulations include:

- The Law on Waters (Nos. 46/91, 53/93, 67/93, 48/94 and 54/96), which regulates the water regime, and is responsible for the water management plan, water permits, water resource conditions, inspections and sanctions;
- The Law on the Protection of Forests (Nos. 46/91, 83/92, 54/93, 67/93 and 54/96), which regulates the establishment of public enterprises, and is responsible for the management, protection and use of forests, inspections and sanctions;
- The Law on Agricultural Land (Nos. 49/92, 53/93, 67/93, 48/94, 46/95, 54/96 and 14/00), which regulates the protection and use of agricultural soil, financing for their protection, use, improvement, inspections and sanctions;
- Regulations on the environmental impact assessment of facilities and works (No. 61/92), which determine the types of installations and activities that require an environmental impact assessment, the content, method and verification of the environmental impact assessment;
- The Law on Natural Parks (Nos. 39/93, 44/93, 53/93, 67/93 and 48/94), which regulates the establishment and protection of natural parks, their management, the establishment of public enterprises, inspections and sanctions;
- Regulations on the handling of waste products of a hazardous nature (No. 12/95), which define and classify waste according to the Basel Convention, the temporary storage method on the manufacturer's premises, technical conditions for storage and record-keeping; and
- The Law on the Handling of Waste (No. 25/96), which regulates waste collection, treatment, storage, incineration and recycling. This Law also provides for the establishment of a new recycling agency.

With foreign assistance a three-year project aimed at harmonizing and strengthening the enforcement of EU legislation will be implemented. The total cost of the project is Fmk 9.5 million (US$ 1.43 million) and will involve legislation at federal and republican levels. There will be a specific focus on (i) environmental impact assessment legislation, (ii) integrated pollution prevention and control (IPPC) and (iii) legislation governing access to information and public participation. The project will begin with Serbia and continue in later phases with Montenegro and the federal level.

Environmental impact assessment and permits

Serbia does not have an integrated environmental permit system, nor media-specific permits except for the water resource permit. Environment responsibilities are very fragmented and a number of ministries issue permits in an attempt to limit the negative environmental impacts of certain activities. An important permit is the construction permit issued, on the basis of the Law on the Construction of Facilities (Nos. 44/95 and 24/96), by the Ministry of Construction and Urban Planning. This Law can require certain facilities to include an environmental impact assessment in the technical documentation for their construction. Approval of the environmental impact assessment study by the Ministry for Protection of Natural Resources and Environment is required before a

construction permit is issued. There are currently three staff persons working on environmental impact assessment (EIA). The approved study, including technical prevention or mitigation measures, is often referred to as an "environmental impact assessment-permit".

The EIA procedure consists of a two-tier system. Activities requiring an urban planning permit must have a 'decision on the acceptance of environmental protection requirements' by the Ministry for Protection of Natural Resources and Environment. Activities requiring a construction permit must have a 'decision on the approval of the delivered detailed environmental impact assessment'. To obtain the first decision, a 'preliminary environmental impact assessment' has to be prepared by an independent institution. The 'more detailed environmental impact assessment' is a specific analysis of the expected impacts, including potential accidents. In both cases, professional consultancies approved by the Ministry have to undertake the studies at the investor's expense.

Regulations on the environmental impact assessment of facilities and works set out approximately 60 general types of facilities and works requiring an environmental impact assessment. Before 1992, no environmental impact assessments were carried out. Although the Regulations have been in place for 10 years, very few large industries have started up, and the approximately 6000 environmental impact assessments produced so far are mainly for small and medium-sized enterprises such as petrol stations and manufacturing enterprises. Many of the smaller enterprises could be regulated by standard regulations on measures for environmental protection in order to ease the burden on the environmental administration. There is no provision for an environmental impact assessment on change of ownership (privatization).

There are no provisions for public participation or access to information. However, the proposed law on the environmental protection system includes articles on access to information (art. 80) and public participation (art. 83). In addition, new provisions for environmental impact assessment and strategic environmental assessment will be drawn up to meet the legislative requirements of the European Union. Public participation will be required at various stages of the impact assessment, either through public hearings or written comments (see also chapter 3, on information, public participation and awareness-raising). The new law also provides for environmental permits as a new and important regulatory tool for environmental management.

Based on the Law on Waters, a water resources permit is required for the abstraction of water from surface and underground water systems, and for the discharge of water into surface and groundwater and into sewage systems. Depending on the water source, the Ministry of Agriculture and Water Management, the municipality or the public enterprise for waters is the competent authority for the issuance of a water resources permit (see chapter 5, on water management).

The number of EIA reports will increase. These reports are not stored in a computerized database, nor are the norms and standards that apply to the facilities. Information retrieval is difficult.

Compliance and enforcement

In Serbia, there are two competent authorities for environmental inspection. At the republican level there is the republican environmental inspectorate and at the local level there are municipal inspectors. The republican inspectorate comprises 40 inspectors, of whom 8 are responsible for nature conservation. The 32 inspectors are not specialized in noise, waste or air pollution, but have a more general training such as engineering. They are mainly involved in inspecting the application of environmental protection measures identified in the (preliminary) environmental impact assessment. There are five regional inspectorates in Serbia. Inspectors are authorized to impose preventive or mitigation measures as well as to halt production until certain prescribed measures are in place. According to the environmental inspectorate, approximately 4000 inspections were carried out in 2001. The environmental inspectorate has five cars to cover 17 municipalities, and only seven inspectors have personal computers.

In 2001, US$ 44,000 was spent on the acquisition of inspection equipment and US$ 22,000 on training inspectors. This means that more than 10% of total expenditure was on the inspections. Despite this expenditure, enforcement capacity remains a weak link in the legal framework. The responsible authorities acknowledge this and distinguish three problem areas in compliance and enforcement:

- Hardware: inadequate monitoring and inspection facilities, vehicles, equipment, materials;

- Software: inappropriate monitoring, information and management systems, processes, procedures, tools; and
- Human resources: inadequate human resources and individual skills.

The environmental inspectorate cannot access a database on the registered environmental impact assessment-permits, including the norms and standards that apply to the facilities. There is no legal requirement for planning, and inspections are ad hoc. It is not known how many companies require inspection. The inspectorate receives a copy of a part of the environmental impact assessment, notably the part with the required measures to prevent or mitigate the environmental impacts of the proposed activity.

Due to the fragmentation of competences, the environmental inspectorate does not have competence for soil and water inspection and little or no cooperation exists with other inspectorates. The fragmentation of competences leads to confusing situations. For example, in nature reserves with production forests, there are three authorities responsible for management and inspections; namely the republican inspectorate of the Ministry for Protection of Natural Resources and Environment, the Public Enterprise "National Parks of Serbia" (see also chapter 9, on biodiversity conservation and nature protection) and the forestry inspection recently moved to the new Ministry. In cases of illegal building in a nature reserve, the urban planning inspectorate is the responsible authority.

Institutional framework

Until May 2002, the main institution for environmental management was the Ministry for Health and Environmental Protection and in particular its Directorate for Environmental Protection. A new Ministry for Protection of Natural Resources and Environment was created by the Law on Ministries, with the following competencies:

- Environmental protection and sustainable use of natural resources (air, water, land, minerals, forests, fish, and wild plant and animal species);
- The preparation of strategic documents, plans and programmes or research work;
- Nature protection;
- The preparation of geological research for the sustainable use of resources and groundwaters;
- The identification of potential nature conservation areas;
- Protection against noise and vibrations;
- Environmental protection measures in spatial planning and buildings;
- The monitoring of the state of the environment;
- Protection against non-ionizing radiation, chemicals and (hazardous) waste; and
- The inspection of environmental protection and the sustainable use of resources.

The new Ministry for Protection of Natural Resources and Environment now also has the competences of the forest authorities:

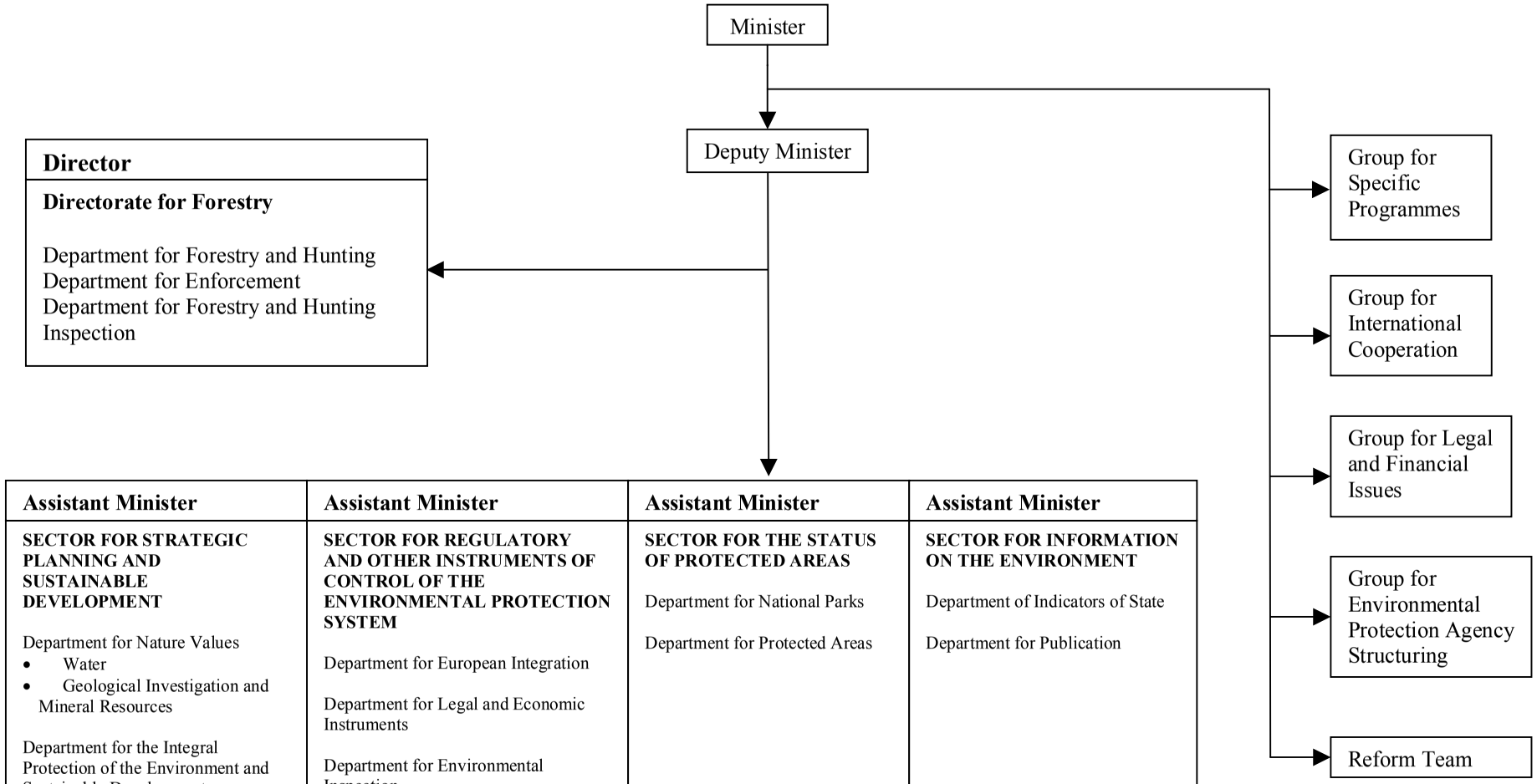
- Forestry policy-making and enforcement;
- The protection of wild animals and forests; and
- The control of seeds and seedling materials in forests.

In addition to the Ministry for Protection of Natural Resources and Environment, there are a number of institutions that monitor and protect parts of the environment. The Institute for Nature Protection is responsible for protecting natural parks and wild fauna and flora. The Public Institute for Health is responsible for monitoring the pollution of air, noise, water and groundwater in urban areas. The Ministry of Agriculture and Water Management is responsible for the protection of soil and water resources and forests. The Recycling Agency monitors and records the state and use of secondary raw materials. The Republic Hydrometeorological Institute also monitors air and water.

Other ministries with competences relevant to the environment include:

- The Ministry of the Economy and Privatization (industrial issues and small and medium-sized enterprises (SMEs));
- The Ministry of Construction and Urban Planning (urban planning and utilization permits);
- The Ministry for Mining and Energy (energy tariffs, energy efficiency, permits for the exploitation of mineral resources);
- The Ministry of Transport and Telecommunications (road, air, rail and water traffic); and
- The Ministry of Tourism.

Figure 1.2: Ministry for Protection of Natural Resources and Environment, Serbia



At municipal level, the secretariats for environmental protection have limited responsibility for environmental issues that includes local air protection, noise protection, urban planning and construction permits for small facilities. They do not have competences for environmental impact assessment as this responsibility is ministerial. Should there be alarming emissions, the municipalities can issue more stringent emission limit values in their areas with the Minister's approval. No cases are known where stricter emission limit values have been applied. In addition, municipal waste management (collection, landfill site selection and operation) falls within the competences of the environmental secretariats. The municipalities also ensure that settlements are monitored by authorized specialized organizations on the basis of a programme coordinated with the Air Quality Control Programme adopted by the Government. There are 161 municipalities in Serbia (excluding Kosovo and Metohija) though not all of them have an environmental secretariat. In cities with no environmental secretariat, republican environmental inspectors carry out the tasks allocated to the secretariat.

There is considerable overlap and fragmentation of environmental protection responsibilities. In addition, there is little coordination between the various activities of the responsible institutions. Repetition and fragmentation can lead to the shifting of environmental problems to other media and the inefficient allocation of resources. For example, environmental problems related to uncontrolled waste sites can lead to soil and groundwater pollution that do not fall under the competence of the Ministry for Protection of Natural Resources and Environment.

1.4 Montenegro

In 1991, Montenegro's National Assembly declared it an 'ecological State'. This statement later formed part of the Constitution and reflects a commitment of the Government at the highest level to protect the environment. It does so through the Ministry of Environmental Protection and Physical Planning (see discussion on the institutional framework, below.)

For political reasons, there is little or no cooperation between the Montenegrin Ministry of Environmental Protection and Physical Planning and the federal environmental authorities.

The 1991 Law on Self-Government provides for the establishment of environmental secretariats at the municipal level. These secretariats are responsible for nature, water, forests and other public goods of local importance.

The policy framework

In November 2000, Montenegro published its first report on the State of the Environment. This report is now published yearly. It outlines the state of the environment in general terms, as specific data are not available due to a poor and unorganized monitoring system (see also chapters 3, on monitoring, information and public participation and 6, on air management). The State-of-the-Environment report is a first step in identifying the extent of Montenegro's environmental problems and its monitoring system's problems. As such, it is an important element of a national environmental management system and a basis for developing a strategic approach to solving and mitigating the problems.

In March 2001, the Government adopted the "developmental directions for Montenegro, the ecological State" which provided long-term strategic directions, including environmental, economic and social aspects. The drawing-up of this strategy started back in 1996 and was developed with the assistance of the European Centre for Peace and Development. This broad and far-ranging document outlines goals for Montenegro as an ecological State, including for sectors such as agriculture, culture, health, biodiversity, economic and social-human development, thereby taking the three main pillars of sustainable development equally into consideration.

Based on the environmental development directions, terms of reference were drawn up for a national environmental protection programme (NPZZS), and it was put out to tender. No further action has yet been taken on the NPZZS. The Ministry of Environmental Protection and Physical Planning expects to close the tender before the end of 2002. At the same time, Montenegro is interested in developing a national environmental action plan.

Montenegro's 1996 Law on the Environment prescribes the development of an ecological programme by the Government, which should be implemented by the NPZZS once it has been developed. Local authorities are expected to

develop their own environmental protection programmes in compliance with the ecological programme within six months of the ecological programme being adopted. Local capacity to develop and implement such programmes appears to be limited.

Kotor, a municipality with 22,000 inhabitants and a United Nations Educational, Scientific and Cultural Organization (UNESCO) world cultural heritage site, is the only municipality in Montenegro that has developed a local environmental action plan (LEAP). Part of the process was an extensive public participation procedure, including the establishment a technical and a civil council. Due to financial constraints, the municipality is struggling with the implementation of the LEAP.

The legal framework

Montenegro published its Law on the Environment (No. 12/96) in 1996. This Law lays down the main principles, such as polluter pays, environmental impact assessment, data transparency, and user pays, for environmental protection. However, few by-laws have been developed to implement these principles.

Other relevant laws and regulations include:

- The Law on Air Protection (No. 14/80) and its subsequent Regulations on admissible concentrations of harmful substances in the air (Nos. 4/82 and 8/82), which set ambient air maximum allowable concentrations (MAC) for various sectors such as the metal and chemical industries, and energy production;
- Regulations on permitted amounts of hazardous and harmful substances in soil and water for irrigation and methods for their testing (No. 23/94), which regulate soil quality in terms of hazardous chemical substances content;
- The Law on Waters (Nos. 16/95 and 22/95), which regulates changes in waters and watercourses, flood protection and protection against other harmful effects, and the supply of waters for various uses; and
- Regulations on environmental impact assessment (No. 14/97), which prescribes the activities subject to EIA, the preliminary assessment procedure, criteria for assessment reports, public participation and the procedure for the evaluation and verification of EIA.

Environmental impact assessment and permits

The Law on the Environment requires an environmental impact assessment for a project that may have adverse effects on the environment. As part of the environmental impact assessment, an environmental protection programme has to be provided which would include impacts in the event of an accident or emergency, a register of the type, quantity and method of disposal or release of detrimental or hazardous substances and deadlines for respective measures for the proposed project or activity. The Regulations prescribe 79 categories of activities requiring an environmental impact assessment. The categories are very general with few specifications as to size, impact or clear distinction in the type of enterprise. The Ministry of Environmental Protection and Physical Planning has two staff members working on environmental impact assessments.

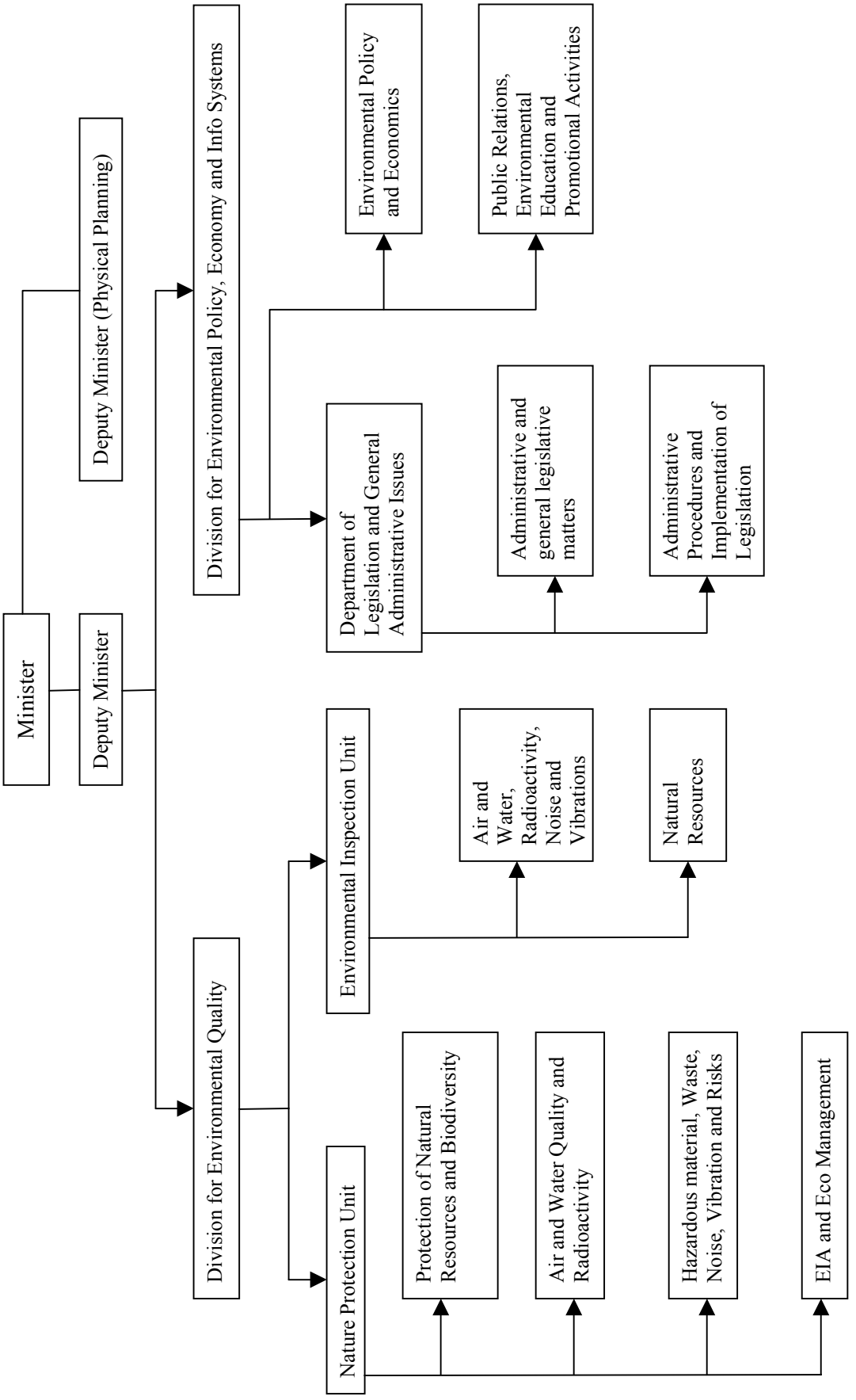
Public participation is not mandatory for an environmental impact assessment. It is left to the discretion of the Ministry to organize public hearings for major projects and define the procedures for these hearings. On the basis of an approved environmental impact assessment, the Ministry issues an ‘ecological permit’ containing the prevention and mitigation measures identified in the environmental impact assessment. As the competences of the Ministry of Environment and Physical Planning cover only biodiversity and air, the content of the environmental impact assessment is also limited to these areas. No preventive or mitigation measures are given for the protection of water or soil.

According to the 1980 Law on Air Protection, prior authorization is required for activities likely to exceed maximum allowable concentrations. The Ministry of Environmental Protection and Physical Planning issues permits only after the adoption of prescribed protection measures. The air quality standards set MACs for more than 100 substances of various sources, such as the metallurgical and chemical industries, energy production and motor vehicles (see chapter 6, on air management)

Compliance and enforcement

According to the Law on the Environment, “inspection shall be performed by the ecological

Figure 1.3: Ministry of Environmental Protection and Physical Planning, Montenegro



inspectorate in compliance with the law." The Law furthermore includes information-sharing with other inspectorates on measures taken. There are environmental inspections of the 'ecological permits' at the republican and municipal levels. Inspections are carried out by the ecological inspectorate that is responsible directly to the Ministry. There is a potential conflict of interest here as the issuance and the control of permits are done by the same organization. Municipalities carry out local inspections such as sanitary inspections at landfills. There are additional inspectorates at the republican level for mining, energy, forestry, veterinary services and water. Little or no cooperation exists between the environmental inspectorate and the other inspectorates.

Inspections are carried out in various ways, they can: (i) be planned, (ii) be ordered by the Deputy Minister or Minister, (iii) follow complaints, (iv) take place after an accident, and (v) take place at facilities requiring an environmental impact assessment. The phone number of the environmental inspectorate is published in newspapers to ease access for plaintiffs. In 1996, the environmental inspectorate started with one inspector. Currently, there are four. In the year 2000, 231 inspections took place, of which 57% were regular inspections, 23% a result of inspector decrees, 16% a result of complaints, and 4% ordered by the Deputy Minister. Out of the total, 19% led to mandatory sentences.

Inspections are ad hoc, and there is no inventory of industries with an environmental impact. According to the inspectorate, a pollution inventory is being developed, but no data could be provided.

Following a study for the Regional Environmental Reconstruction Programme (REReP) on strengthening environmental enforcement capacity in the Balkans in 2001, the following shortcomings in inspection and enforcement were identified:

- Too few inspectors;
- A lack of municipal environmental inspections;
- A lack of specialization of inspectors (air, water, soil, nature conservation);
- A lack of modern quick-reaction technical equipment and support for it;
- Incomplete environmental legislation;
- A lack of harmonized regulations underlying the activities of all bodies of the Ministry and other inspectorates;
- A lack of training programmes and organized permanent education in environmental protection; and
- A lack of standardization of the work and action of inspectorates and individual inspectors.

The institutional framework

The Ministry of Environmental Protection and Physical Planning, with 20 staff members, is the main competent authority for the environment. It is responsible for the implementation of the Law on the Environment and its subsequent regulations. The competences of the Ministry include the environmental protection system, air, noise and vibration, nature conservation and parks, inspection and enforcement, and international cooperation.

Its Environment Department consists of two divisions: one for Environmental Quality and one for General Environmental Policy. The ecological inspectorate is part of the Division for Environmental Quality. There are four other institutions under the administration of the Ministry of Environmental Protection and Physical Planning:

- The Institute for the Protection of Nature;
- The Republican Hydrometeorological Institute;
- The public enterprise for the management of Montenegro's national parks; and
- The Centre for Ecotoxicological Research.

The Ministry of Agriculture, Forestry and Water Management is responsible for the protection of soil, forests and water, and the Ministry of Health is responsible for the protection of public health against environmental impacts.

Environmental secretariats are responsible for nature protection, water, parks and forests of local importance. These responsibilities are laid down in the 1991 Law on Self-government , not in the Law on the Environment.

1.5 Conclusions and recommendations

Recommendation to the Federal Government

Recommendations of relevance to Yugoslavia's decision-making framework may be found in chapter 4 on international cooperation, in particular recommendations 4.1 and 4.4.

Recommendation to the Federal Government, Serbia and Montenegro

Following the adoption by the Government of Yugoslavia and the national assemblies of Serbia and Montenegro of "The Agreement on Principles of Relations between Serbia and Montenegro," Yugoslavia is in the process of determining future constitutional competencies in many areas, including those of relevance to the environment. At the same time, Yugoslavia has entered into a framework agreement with the European Union and has begun to consider harmonizing its legislation with EU standards (see chapter 4, on international cooperation).

Recommendation 1.1:
*The **Federal Government of Yugoslavia**, in cooperation with the **Serbian** Ministry for Protection of Natural Resources and Environment and the **Montenegrin** Ministry of Environmental Protection and Physical Planning,*

(a) *Should take advantage of their constitutional reviews and the framework agreement with the EU to harmonize all legal instruments concerning the protection of the environment and the management of natural resources; and*
(b) *Should establish a mechanism to coordinate the process of approximation to EU legislation.*

Recommendation to Serbia and to Montenegro

The Agreement reached on 12 July 2002 between Serbia's Ministry for Protection of Natural Resources and Environment and Montenegro's Ministry of Environmental Protection and Physical Planning is intended to provide for cooperation on environmental protection.

This Agreement should improve and accelerate decision-making on: (i) a unified position on the ratification of international environmental agreements, in cooperation with the Yugoslav Ministry of Foreign Affairs, other relevant ministries, and international organizations; (ii) coordination of the approach to international funding organizations; (iii) transboundary issues between the constituent republics on issues of shared concern (e.g. transboundary rivers, mountains, lakes, marine protection); (iv) coordination of the policy approach to global issues (e.g. atmosphere, chemicals, hazardous waste, biodiversity), in cooperation with the Yugoslav Ministry of Foreign Affairs, and relevant international organizations; and (v) harmonization of the approach to the European Union institutions and programmes (e.g. CARDS), and to the REReP in the framework of the Stability Pact, in cooperation with the Ministry of Foreign Affairs, the Ministry of Foreign Economic Relations, and the relevant European or international agencies.

Recommendation 1.2:
***Serbia**'s Ministry for Protection of Natural Resources and Environment and **Montenegro**'s Ministry of Environmental Protection and Physical Planning should implement the Agreement that they reached on 12 July 2002 on cooperation on environmental protection. Implementation should be consistent with the new constitutional charter and in cooperation with the relevant Yugoslav Ministry.*

Recommendations to Serbia

An environmental management system should include monitoring, environmental policies and specific instruments (command and control, economic and communication) to implement these policies. In Serbia, the overall environmental management system is unevenly developed. While the command-and-control instruments, including standards and environmental impact assessments, are well developed, both policy development and law enforcement are in the early stages of transition and require major support in terms of capacity and finance. No environmental or sustainable development policies exist, nor is there a national environmental action plan to provide a framework of guidance and direction. In 2001, a State-of-the-Environment report was produced. It formed the basis for a number of priorities. It is unclear, however, how they will be addressed, who is responsible, what the financial implications are and how long it will take place.

Recommendation 1.3:
Based on the 2001 State-of-the-Environment report, the Ministry for Protection of Natural Resources and Environment should further develop an environmental policy, to be approved by the Government, to set clear and achievable goals and objectives. This environmental policy should be implemented through an action plan clearly specifying the responsible actors and the required actions, in a realistic time frame and outlining the means of finance.

A wide range of laws and regulations, including some standards and norms, has been developed. In addition, a system for environmental impact

assessment is in place resulting in so-called environmental impact assessment-permits. However, as yet, there are no integrated environmental permits. The new draft law does provide for integrated pollution prevention and control, improved EIA procedures and a strengthened inspectorate. Until now, due to the poor economic situation and low political priority, compliance and enforcement have been a weak link in Serbia's environmental management system. Inspectorates have few facilities to fulfil their tasks, and there is a significant fragmentation of responsibilities.

Recommendation 1.4:

(a) The National Assembly should adopt the draft law on the environmental protection system at its earliest opportunity; and

(b) The Ministry for Protection of Natural Resources and Environment should prioritize compliance and enforcement by providing appropriate training in inspection, equipment and human resources to its inspectorate. The Government should allocate sufficient funds for this purpose; in addition, twinning arrangements could be sought with other countries.

Since 1992, environmental impact assessments are compulsory for new activities. Measures are prescribed to prevent or mitigate negative environmental activity. The Regulations did not include any requirements for existing, and often heavily polluting, industries. Serbia is planning to adopt a new environmental protection law. New environmental impact assessment procedures will be developed in accordance with European Union legislation. As many of these pre-1992 polluting industries are still in operation, and are expected to be so for some time in the future, their environmental performance should be improved.

Recommendation 1.5:

The Ministry for Protection of Natural Resources and Environment should require a compliance plan from pre-1992 polluting industries. It should be based on environmental audits done by the enterprises. As a result, the Ministry for Protection of Natural Resources and Environment should issue environmental permits taking into account the compliance plan, stipulating a time frame and the measures required to comply with existing standards and norms.

Recommendations to Montenegro

Since the start of its transition, the National Assembly of Montenegro has acknowledged the importance of the environment for its future development. This was emphasized by its declaring Montenegro an 'ecological State' in the Constitution. Most elements of a national environmental management system are in place; a state-of-the-environment report outlines the environmental problems and, on the basis of these problems, a sustainable development strategy has been developed which will be implemented through a national environmental protection programme (NPZZS).

The process to promote the 'developmental directions for Montenegro, the ecological State' has taken about five years. Following its approval, the Government agreed in May 2001 on the terms of reference for the development of the NPZZS. A year later, the tendering process is still open and is expected to be so until the end of 2002.

Recommendation 1.6:

The Ministry of Environmental Protection and Physical Planning should develop a national environmental action plan following the document called 'developmental directions for Montenegro, the ecological State'.

Environmental problems are not considered an integrated problem in Montenegro, which for historical reasons, has developed a media-oriented approach focusing on soil, water and air. Competences have been divided over several ministries and their inspectorates. As a result, the Ministry of Environmental Protection and Physical Planning has the main competency for air and biodiversity. On the basis of the Law on the Environment, water, soil and air require protection by the Ministry, though inspections focus only on air and biodiversity. Most environmental problems require a more integrated approach. A clear example of this are waste sites, which pollute the air with methane emissions, and can pollute both soil and groundwater with the leakage of polluted drainage water. Such an approach would require an overhaul of the existing system, which is not feasible in the short term for financial and organizational reasons. However, closer cooperation among inspectorates could prove a starting point, resulting in better integration at the

operational level. In addition, limited resources for inspections could be used more efficiently.

Recommendation 1.7:
The environmental inspectorate should improve the coordination of joint inspections with the various inspectorates for water, forestry, sanitation and nature conservation, preferably starting with the biggest industrial polluters, and develop a joint pollution database as a first step towards an integrated approach to environmental problems.

Chapter 2

ECONOMIC INSTRUMENTS AND FINANCING

Economic instruments for environmental protection

2.1 Yugoslavia

Economic instruments for environmental protection are not mentioned in the Federal Law on the Basic Principles of Environmental Protection, unlike the laws of Serbia and Montenegro. Despite the fact that the present tax systems allow the introduction of so-called "eco-taxes", there has been no move to do so either by Yugoslavia or by its constituent republics to date.

The few economic instruments that are in place are mainly conceived as user charges for water and waste to raise revenue. However, in an attempt to reduce pollution, the Federal Secretariat for Labour, Health and Social Care (specifically its Environment Department) has agreed to introduce certain financial and economic incentives into the Federal Law on Customs, the Federal Law on Foreign Trade, the Federal Law on Free Zones and the Federal Law on Concessions.

2.2 Introduction

A number of economic instruments have been introduced in Serbia and Montenegro, although the role of economic instruments for environmental protection has not been fully recognized. In principle there is agreement with the polluter pays and user pays principles. However, the Ministries of Finance are reluctant to introduce new environmental taxes for fear that this may represent a return to the recently eliminated complex tax system and that there could be political repercussions from imposing new taxes on a population that is just beginning to recover from a decade of economic hardship. On the other hand, economic instruments can have a number of fiscal advantages that are in line with Serbia's and Montenegro's overall economic reform agenda, including cost recovery for public service enterprises and increased fiscal revenues. Both constituent republics have introduced tax allowances in the form of exemptions from income taxes, excise duties and sales taxes and accelerated depreciation for investment in cleaner technologies.

The existing economic instruments in Serbia and Montenegro do not provide enough incentives for consumers and producers to change their attitude to environmental protection. The main problem of the effectiveness of existing economic instruments is the inadequate level of charges and non-compliance fees. Charge levels have not been adapted to inflation and were kept low during the 1990s. The low charges for public services and natural resources have resulted in the inefficient use of resources. Broader problems related to the implementation of existing economic instruments include the extent of the grey and untaxed economy, the inability of several enterprises to pay their fines because they are insolvent, legislative gaps regarding the enforcement of delayed payments, organizational weaknesses in the collection of charges, the limited powers of inspectorates to imposed sanctions in case of non-compliance, and the lack of political support for the effective enforcement and implementation of economic instruments.

2.3 Serbia

Background and policy objectives

Serbia's Law on Environmental Protection (1991) does not specifically mention the introduction of economic instruments, but specifies sources of financing environmental protection, including, according to article 88:

- Pollution taxes;
- Budgetary funds originating from a 5% tax on pesticides, plastic packaging and cigarettes;
- Budgetary funds originating from a 1% tax on coal and oil derivatives, and on motor vehicles;
- 1% of total investment capital for legally required environmental impact assessments on new plants in the industry, energy and transport sectors;
- Interest repayment on loans;
- Environmental fines; and

- Other sources.

In practice, only the investment tax, introduced in 1992, is in place. This tax was earmarked for environmental expenditures, but this has not been enforced. The same is true for environmental fines. Pollution taxes have never been introduced, and product sales taxes were introduced only partially. Another specific source of revenue for environmental expenditures was a 5% charge based on the market value of wild plants and animal species collected for commercial purposes. This was successfully earmarked for the environment and collected for a period of time, but it has been discontinued.

The Law on Environmental Protection states that the revenues from these instruments are to be used for certain environmental activities, such as monitoring, training staff, crediting investments for reducing environmental pollution, and scientific research. It appears, however, that, during the 1990s, only a small portion of the earmarked revenues reached the special account of the former Directorate of Environmental Protection. In 2001, in the framework of budgetary reforms, the earmarking of public revenues and special extrabudgetary accounts were abolished, and all revenues are now credited to the State budget.

Unfortunately fiscal reforms in Serbia have not resulted in the introduction of fiscal incentives for environmental purposes. The incentives are not incorporated in the Law on Income Tax (2001), the Law on Excise Tax (2001), the Law on Property Tax (2001), and the Law on Sales Tax (2001). Despite the fact that the present tax system allows for the introduction of additional special taxes, including eco-taxes and environmental tax incentives, the Ministry of Finance and Economy seems reluctant to move in this direction. Currently, the dominant role in the area of economic instruments in Serbia is played by tax incentives for environmental investments. However, the current instruments, along with the under-pricing of water and other resources, are not stimulating enough to change the population's behaviour or consumption patterns.

The Serbian draft law on the environmental protection system proposes a chapter on economic instruments, which defines in more detail the use of new economic instruments for financing environmental protection. It also introduces the polluter pays and user pays principles.

Economic instruments

Instruments for air pollution management

Air management is based on the Law on Environmental Protection (1991) and on the Regulations on Emission Limit Values, Methods and Time Frame for Measuring and Data Noting (No. 30/1997) and the Regulations on Limit Values, Imission Measuring Methods, the Selection of Sample Spots Criteria and Data Collecting (No. 50/1992). The Law and regulations do not define air emission charges or taxes.

According to the Law on Environmental Protection, an enterprise or legal entity can be fined up to 450,000 dinars if it does not ensure that air emissions are within the prescribed limits, or if it does not follow the commitments and measures stipulated by the municipality to prevent air pollution.

Instruments related to transport

Several transport-related taxes have been introduced without an environmental purpose, but which may affect transport. These include, through the Law on Roads, an excise duty on fuels, a road user tax (road toll) and an annual vehicle registration tax.

Revenues from road tolls are collected by the Road Directorate within the Ministry of Transport and Telecommunications and are mainly used for new road construction and maintenance. The revenues from the annual vehicle registration are shared between the Road Directorate and local budgets. The revenues of these taxes are not used for environmental purposes.

The Law on Excise Duty (effective 1 April 2001) established an excise duty for oil derivatives. The Law does not differentiate between leaded and unleaded petrol. There is no analysis of the estimated market share of unleaded petrol in the country, but it is thought to be marginal due to the high average age of cars.

Instruments for water resources management

Instruments for water resources management include abstraction charges, user charges for water supply, sewerage and waste water, and non-compliance fees. Charges on effluent discharges do not exist in Serbia. The Law on Waters governs the

conditions of water resources management. The Ministry of Agriculture and Water Management is responsible for the management of water resources, water pollution and protection.

Economic policy has kept water charges and prices low for several years. In general, the price policy for drinking water and water treatment facilities falls within the competence of municipalities. In most cases, water services charges are collected by municipal service companies together with other municipal service charges, such as those for solid waste, heating and electricity. In many cases (but not all) revenues are then arbitrarily distributed among the different services, without any relation to the amounts actually billed. Water companies have little control over bills paid by domestic consumers and are unable to use proper commercial practices. Revenues are also normally complemented with direct transfers from municipal budgets. For example, Novi Sad Water Company has a budgeted contribution of 206 million dinars for 2001, against a projected revenue from billing of 360 million dinars.

Drinking water prices differ from city to city according to the consumer category and range from 0.5 to 10 dinars/m^3 in 1998. Households pay less than industries. Additionally, population poverty and industrial decline have reduced collection rates to below 50%, despite the low tariffs. Currently, the revenues of the water utilities do not even cover operating costs. Utilities are not able to properly maintain or upgrade their facilities so that water and waste-water services are deteriorating. In order to cover the operating and investment costs incurred by the service companies, the price of drinking water and sewage should be much higher. Although prices were increased recently, they are still not sufficient to cover the full cost of the services. The situation is further exacerbated by extremely low collection rates.

Tariffs for the maintenance of the sewerage system ranged from 0.1 to 9 dinars/m^3 (in 1998). In addition to the sewage charges, waste-water charges were introduced through the Decree on Tariffs for Water Consumption and Tariffs for the Protection of Water (No. 2/1997). The waste-water charges are paid by enterprises and the tariffs depend on the category of the polluter. Rates are decreased if the waste water has been treated before it is discharged. Enterprises that have waste-water treatment facilities are exempted from these charges if the quality of the water is adequate. Revenues are used for water protection and waste-water treatment. Revenues are collected by the Serbian Ministry of Agriculture and Water Management. There used to be a Water Fund, but charges are now collected in the agricultural budget.

According to the Decree on Tariffs for Water Consumption and Tariffs for the Protection of Water, tariffs are laid down for extracting surface water and groundwater for industrial purposes, for agricultural purposes and for drinking water supply (effective from 1997) (see table 2.1).

The Serbian Electric Power Enterprise (EPS) is charged for each kWh of electric power produced. For electric power produced at the hydroelectric power stations this is 2.3% of the kWh cost to customers, and for thermal electric power stations, 1.25% of the kWh price charged to customers.

There are separate charges for discharging treated and non-treated waste water into man-made channels. These charges are collected by the Public Water Management Enterprise ("Srbijavode") and are used for the maintenance of canals and related facilities. The charges are paid according to the quantity of the discharged water, i.e. the amount of pollution, based on a scheme defined by the Decree on Tariffs for Water Consumption and Tariffs for the Protection of Water.

The Serbian Law on Environmental Protection states that an enterprise can be fined up to 450,000 dinars if it discharges sewage containing hazardous

Table 2.1: Tariffs for water consumption, 1997

Untreated water	0.027 dinars/m^3
Drinking water for sale	0.090 - 0.045 dinars/m^3
Drinking water for consumption	0.075 dinars/m^3
Hydroelectric power stations	2.3% price/kWh
Thermal power stations	1.25% price/kWh

Source: Decree on Tariffs for Water Consumption and Tariffs for the Protection of Water, Official Gazette No. 2/1997.

materials exceeding the prescribed limits, carries out other activities liable to deteriorate the prescribed quality of water, or discharges sewage without systematically checking water quality and quantity.

Instruments for waste management

The only economic instrument related to waste management is the user charge for municipal waste services. The waste collection and disposal charge is calculated according to the size of residential or business premises. So the charge is not directly related to the volume of waste produced. Applying present regulations, solid waste charges are set by each municipal service enterprise and vary widely. Collection is undertaken by municipal enterprises. Before the decree on the price of municipal services was issued in February 2002, households were charged from 0.4 to 1.2 dinars/m^2. Since February 2002, the charge for households has been 1.2 dinars/m^2 (No. 2/2002). The collection rates vary from one municipality to the other and range from 10 to 70%. Research shows that the collection rates depend on the collection method. Much better results have been achieved where a single collection is made for several municipal services.

Practice shows that the municipal waste user charges do not correspond to the costs of waste disposal and are not high enough to stimulate a change of behaviour. Current charges do not cover all treatment costs, and many municipalities provide subsidies. The price of services involving waste collection and disposal should be increased to cover their full costs.

At the moment, there are no charges for hazardous waste in Serbia, and there is no separation of waste according to hazardousness or need for special handling.

The Serbian Law on the Handling of Waste lays down fines for enterprises and for individuals. The fine for fly-tippers is 100 to 1,000 dinars. According to the Law an enterprise or legal entity that discharges dangerous waste on the ground or buries it elsewhere than in dumps or treatment plants specially provided for this purpose can be fined up to 100,000 dinars. The revenues are not earmarked for environmental purposes. The Law does not stipulate explicitly who is responsible for implementation. For legal entities it could be done by courts after charges are laid by an environmental inspector, while for physical persons the issue remains open. In addition, the level of fines is inadequate to encourage pollution reduction.

Economic instruments for natural resources management

Economic instruments for natural resources management are widely used in Serbia. The taxes and payments are mainly related to the abstraction and use of water and minerals, the use of land and forests, and fishing and hunting. The taxes and payments are more command-and-control than economic incentive, and are used to enforce nature protection legislation.

Procedures for the use of natural resources are laid down in several laws and regulations, including the Decree on the Protection of Natural Rarities (1993), the Law on Natural Parks (1993), the Law on Hunting (1993), the Law on Fishing (1994), the Law on Agricultural Land (1992), the Law on Mining (1995) and the Law on the Protection of Forests (1991).

2.4 Montenegro

Background and policy objectives

Montenegro's 1996 Law on the Environment provides the basis for funding environmental protection from the following sources: the budget, eco-charges from specific local sources, and other sources. Eco-charges are defined as (a) charges on investments and (b) charges on environmental pollution. The investment charges to be paid by the investor are: 2% of the investment value on the area of national parks, unless the project is in direct functional relation to nature conservation, and 1% of the investment value for projects that legally require environmental impact assessments.

Pollution taxes and charges are planned for air emissions, fossil fuels, ozone-depleting substances, lubricant oils, the production and disposal of hazardous waste, and taxes on motor vehicles and aeroplanes. The revenues from these taxes are to be channelled into a special sub-account in the State budget. However, the environmental sub-account has never been established. The allocations for environmental purposes are distributed directly from the State budget.

The Law on the Environment describes how financial resources should be used, including for the development of an ecological plan, for financing programmes to protect and develop

protected nature resources and for investment programmes that contribute to a significant reduction in environmental pollution, and for training professional staff.

According to the Law on the Environment, there is also a possibility of specific tax incentives:

- For using environmentally sound technologies or production processes;
- For trading in products that have a benign environmental influence;
- For renewable energy resources;
- For equipment and installations that are used for the protection and monitoring of the quality of the environment;
- For producers who organize recycling programmes, deposit-refund systems or any other systems aimed at improving the state of the environment; and
- For recycling businesses.

In practice, however, the above-mentioned instruments have not yet been properly implemented. Several of the by-laws (regulations and decrees) needed to regulate the legal basis for the implementation of these economic instruments are lacking.

Economic instruments

Instruments for air pollution management

Air emission charges were introduced in Montenegro in January 1998. The Decree on Environmental Pollution Charges (No. 26/1997) defines charge levels for SO_2, NO_2, organic compounds, heavy metals, and fluorine substances. The rates are based on the quantity and toxicity of the emissions. In March 2000, new Regulations (No. 9/2000) amended the rates and indexed them to inflation. For the enterprises that do not have monitoring equipment, the charge is DM 800 (€400) for facilities with installed power from 1 to 10 MW. For those facilities with installed power of more than 200 MW the emission charge is DM 15,000 (€7,500) per month. Most enterprises do not have monitoring equipment and therefore pay the fixed monthly amount. Some enterprises prefer to pay the regular charges instead of investing in cleaner technologies or monitoring equipment, since it costs less.

The Decree on Environmental Pollution Charges also includes a carbon tax on the use of fossil fuels. This tax for heavy oils is DM 0.75/ton, for light oils DM 0.60/ton, for coal DM 0.45/ton, for liquid gas DM 0.003/litre, for diesel DM 0.006/litre, for petrol DM 0.003/litre, and for lubricants DM 0.06/kg. Enterprises that use CFC in the production process pay a tax of DM 0.9/kg of CFC used.

If an enterprise cannot keep its emissions within the permitted limits, or if it does not respect the measures for preventing air pollution, it can be fined. There is no specific mechanism for calculating the fine, nor is there either an analysis or an estimation of total yearly revenues from the non-compliance fine. The revenues are not earmarked for environmental purposes and go to the State budget.

Instruments related to transport

Several transport-related taxes have been introduced in Montenegro without specific environmental purposes, but they may affect the amount of transport. The 2001 Law on Sales Tax establishes an excise duty on oil derivatives. The Law does not differentiate between leaded and unleaded petrol. In January 1998, a 10% environmental tax on vehicles was introduced. It is paid on registration of the vehicle.

Table 2.2: Environmental pollution charges

Substances	DM/ton
Benzopyrene	180.67
CO	2.23
SO_2	4.01
NO_2	3.20
HF	13.48
HCl	2.67
Organic substances	3.12
Heavy metals	31.55
Solid particles	18.87

Source: Amendment to Decree on Environmental Pollution Charges (No. 9/2000).

Instruments for water resources management

Instruments for water resources management include user charges for water supply, sewerage and waste-water treatment, water extraction charges, water effluent charges and non-compliance fines. The Law on Waters (Nos. 16/1995 and 22/1995) governs the conditions of water allocation and use, water pollution and financing.

The water sector infrastructure belongs to Montenegro. It delegates its use and responsibility for service provision to municipalities, with each having its own water company. The Ministry of Agriculture, Forestry and Water Management is responsible for the management of water resources and water protection.

Price policy for drinking water and water treatment facilities falls within the competence of municipalities. Drinking water prices differ from city to city according to the category of consumer and range from DM 0.20 to 0.70/m^3 for households. Enterprises and public institutions paid between DM 0.80 and 1.50/m^3 in 2001. The charges for sewage and waste-water treatment are levied on between 30 and 70% of the water used. User charges have recently doubled to begin to adapt to market values. Still, they can cover only a small share of the services.

Montenegro applies water effluent charges. The Decree on Water Pollution Charges (No. 15/1996), based on the Law on Waters, established criteria for determining water pollution charges. The criteria are the quantity of the water discharged, the degree of pollution, the type of water discharged, and the category of location. The charge per polluter is determined by multiplying the quantity of the discharged water by the unit of the pollutant defined in the Decree.

These charges are based on the following parameters: biological oxygen demand, chemical oxygen demand, suspended materials, heavy metals, nitrate, phosphorus, mineral oils, sulphates, cyanides, and pH value. Water effluent charges are paid by enterprises with monitoring equipment. Those which do not have monitoring equipment have to pay a fixed amount. The charges do not constitute incentives for companies to install water-monitoring equipment since they might pay more in the end. For waste water, only standard charges are paid because adequate monitoring systems do not yet exist.

The penalties for water pollution are marginal compared to the cost to the facilities of waste-water treatment. In addition, revenue collection is inefficient for various reasons. Water protection would be more efficient if economic instruments were in place to provide incentives to industry to install water treatment equipment and use new technologies.

Instruments for waste management

While in urban areas 98% of solid waste is collected by a public utility, in rural areas 44% of solid waste is either disposed of in illegal landfills, burned, disposed of near the home, buried or thrown into a river. Each municipality, through its public waste enterprise, is responsible for the collection and disposal of its solid waste. In most cities, this enterprise is an independent public utility company, but in some cases, it is part of a larger public service company that is also responsible for waterworks, markets and parks.

Revenues available for each public waste enterprise are obtained from three sources: municipal waste user charges; general revenues in municipal funds; and direct user charges. The municipal waste charge collected from residents is based on house surface, a method which is not directly related to the volume of waste produced. The charge is established within a range set by the Montenegrin Government. The current charges do not cover all the treatment costs, and in many cases municipalities provide subsidies. The charges differ from municipality to municipality: rates for households range from DM 0.02 to 0.08/m^2, and for enterprises from DM 0.30 to 0.70/m^2.

Charges on hazardous waste were introduced in Montenegro in January 1998. The charge for hazardous waste deposition is 500 dinars/ton and for other waste 250 dinars/ton.

Economic instruments for natural resources management

Natural resources for specific use are leased or permission is granted to individuals, enterprises, institutions and organizations to use natural resources, on the basis of special permits, to carry out industrial or other activities. There is a charge for these permits. The taxes and payments are mainly related to water abstraction and use, the use of land and forests, the extraction and use of minerals, and fishing and hunting. The taxes and payments are more command-and-control than an

economic incentive and are used to enforce nature protection legislation.

Procedures for the use of natural resources are laid down in several laws and regulations, including the Law on Waters (1995), the Law on Agricultural Land, the Law on Forest Management (2001), the Law on Mining (1993), the Law on National Parks (1991), the Law on Nature Conservation (1977), the Law on Hunting (1992) and the Law on Fishing (1992).

Environmental financing and expenditures

2.5 Introduction: the Federal level

The Federal Law on the Basic Principles of Environmental Protection (1998) states that the federal budget is the main source of financing for environmental protection. Its resources are used to finance environmental protection and clean-up programmes adopted by the Federal Government; to finance obligations deriving from international agreements ratified by Yugoslavia; to finance international measures in case of transboundary accidents and for other purposes related to environmental protection at the federal level.

The Federal Resolution on Environmental Policy (No. 31/1993) stipulates that each year an amount of no less than 0.1% and up to 0.3% of Yugoslavia's GDP will be allocated from the federal budget to environmental protection. In fact, due to the difficult economic situation of the past several years, it has never been more than 0.001% of GDP.

2002 budget allocations for environmental expenditures at both federal and republic levels are higher than in 2001. However, disbursements are contingent upon actual budget revenue.

2.6 Serbia

The funds for financing environmental protection are prescribed in articles 88 to 90 of the Serbian Law on Environmental Protection. They include pollution taxes, budgetary funds, environmental impact assessment funds, interest loans, environmental fines, and other sources. According to the Law, funds collected from the aforementioned sources were to be paid into a special account of the former Directorate for Environmental Protection – now the Ministry for Protection of Natural Resources and Environment. The Ministry was to distribute these funds on the basis of a medium-term programme adopted by the Government and an annual plan adopted by the Directorate. In practice, during the 1990s only a small portion of the earmarked revenues reached the special account. The environmental charges – a charge of 5% of the market value of wild plants and animal species and the 1% investment tax – were collected in a transit account of the Ministry of Finance before being only partly reallocated to the Directorate. The inflow of these funds in 1997 was only 50% of the planned amount. Since 2001, in the framework of budgetary reforms, the earmarking of public revenues and special extrabudgetary accounts were abolished. The Ministry for Protection of Natural Resources and Environment now receives its entire budget from the Ministry of Finance and projected budget allocations are made at the beginning of the fiscal year.

The activities to be funded by the above public resources listed in the 1991 Law on Environmental Protection are:

- Monitoring the state of the environment;
- Co-financing equipment for technical and scientific institutions in the area of environmental protection;
- Co-financing specialized training for personnel dealing with environmental protection;
- Creating investments to substantially reduce environmental pollution;
- Incentives for developing preliminary designs, applied scientific research projects, studies, surveys, contracting projects;
- Financing programmes for the protection and development of natural resources;
- Financing organized efforts to prevent environmental degradation and clean up pollution; and
- Co-financing publications, magazines and public awareness drives in the area of environmental protection.

The draft law on the environmental protection system also defines activities that should be funded for the sustainable management of natural resources and environmental protection. These do not really differ from the activities listed in the Law on Environmental Protection, apart from some new activities that were added. These concern financing the preparation of a strategy, a national programme, and research programmes; the implementation of action and rehabilitation plans; and the development of an environmental information system.

Table 2.3: State budget allocations to the environment, 1998-2002

million dinars

	1998	1999	2000	2001	2002
Total State budget expenditure	9,693	15,848	22,522	45,874	65,936
Budget expenditure on environment	1.2	3.1	8.6	15.9	150.0
Environmental expenditure as % of State budget	0.01	0.02	0.04	0.03	0.23

Source: Federal Secretariat for Labour, Health and Social Care, 2002.

Table 2.4: Expenditure of the Directorate for Environmental Protection, 1998-2001

	1998	1999	2000	2001*
Expenditure (million dinar)	15.3	19.0	19.8	44.0
% of State budget	0.095	0.089	0.069	0.034

Source: Directorate for Environmental Protection, 2002.
Note: * = without salaries and maintenance

The table 2.4 presents the total expenditure of the Ministry for Protection of Natural Resources and Environment, including the costs of salaries (66 persons) and maintenance expenditure. Expenditure as a percentage of the total budget declined from 0.095% in 1998 to 0.069% in 2000. In 2001 the Ministry's expenditure was only 0.03% of Serbia's total budget. It should be noted that expenditure for 2001 does not include salaries and maintenance costs.

In 2001, the amount planned for the Directorate for Environmental Protection was 54 million dinars, of which only 44 million dinars was actually disbursed as a result of lower than expected privatization proceeds. A breakdown of expenditure in 2001 shows that almost 30% of the budget was spent on the mitigation of environmental hazards in industrial enterprises. The beneficiary enterprises were mostly State-owned or socially owned. The Ministry states that this kind of subsidy is the only way to encourage compliance with environmental protection regulations within the financially poor industrial sector. Another 10% of the budget was used to strengthen the environmental inspectorate with new equipment and train the inspectors. The rest was spent on monitoring projects, staff training, assistance to NGOs, and the preparation of documents and publications.

In 2002, the implementation of the planned activities, estimated at 130 million dinars (without salaries), will also depend on the actual allocations from the State budget. The budget is insufficient to support big environmental projects.

The Ministry for Protection of Natural Resources and Environment has entered into a dialogue with the Ministry of Finance for the reinstatement of an environment fund. The Ministry of Finance opposes earmarked funds because it would limit flexibility in controlling public expenditure. The negotiations have led to the inclusion of an article on the establishment of a budgetary fund in the draft law on the environmental protection system. The fund would be established to finance certain priority projects related to the environment and nature protection and for achieving aims determined by a special act or an international agreement.

2.7 Montenegro

Environmental financing and expenditure

The basic provisions on environmental financing are laid down in the Montenegrin Law on the Environment and are based on the polluter pays and user pays principles. Article 35 of the Law provides for the following sources of financing for environment protection: budgetary funds, eco-charges, fines collected in accordance with this Law, funds from special sources prescribed by local authorities with the consent of the Montenegrin Government, and funds from other sources. The Law stipulates that all environmental charges, taxes and fines are to be paid into a special sub-account ("ecological account") within Montenegro's budget. In practice, this environmental account does not exist and allocations for environmental expenditures are distributed directly from the State budget. The disbursements are therefore contingent upon actual budgetary revenues.

The Law on the Environment prescribes the use of the financial resources, including the following specific purposes:

- Realization of an environmental programme;

- Co-financing the programmes for the protection and development of protected natural resources;
- Financing the development and implementation of rehabilitation programmes should the polluter be unknown;
- Co-financing intervention measures in environmental pollution emergencies;
- Co-financing other investment programmes which contribute to a significant reduction in environmental pollution;
- Providing funds for case studies, scientific projects, studies, plans and construction projects;
- Co-financing training of staff in professional, scientific, industrial and public institutions related to the environment;
- Co-financing organized pollution prevention activities and the rehabilitation of the environment carried out by ecological NGOs; and
- Co-financing publications, magazines, professional and scientific gatherings and information and promotional activities in the field of environmental protection and improvement.

Total planned expenditure in 2000 for the Ministry of Environmental Protection and Physical Planning was DM 1.5 million, of which DM 1.28 million went to environmental programmes. The main environmental programmes that have been financed through this budget are: the protection of the environmental quality of the Zeta Plain; a programme for air, soil, biodiversity and ionizing radiation pollution monitoring; research on environmental quality in the Pljevja Valley; the supply of equipment for the national parks; and the draft strategy for the ecological State of Montenegro. Although the budget of the Ministry of Environmental Protection and Physical Planning has increased in recent years, it does not seem to be sufficient to finance its environmental projects and activities. For example, a national environmental awareness campaign had to be stopped because of a lack of finances. In addition, there is hardly any cooperation on environmental projects between the Ministry of Environmental Protection and Physical Planning and other ministries.

The financing of the basic activities of the institutions involved in nature protection (i.e. the Institute for the Protection of Nature, the Public Enterprise for National Parks) is via the Montenegrin budget. The additional activities of the Public Enterprise for National Parks are financed through user fees, such as fishing and hunting licence fees, and fees for the use of raw minerals.

The eco-charges – pollution charges and investment charges – are collected by the Ministry of Environmental Protection and Physical Planning, and amounted to DM 1.9 million in 2001 (see table 2.6). Revenue from investment charges amounted to 88% of the total.

Table 2.5: Budget of the Ministry of Environmental Protection and Physical Planning, 1994-2001 (million dinars in 1994-1999 and DM million in 2000-2001)

	1994	1995	1996	1997	1998	1999	2000	2001
Total	0.47	1.29	4.64	8.76	10.86	14.93	1.50	1.87
Salaries	..	..	0.37	1.02	1.20	1.76	0.19	0.24
Administration	0.02	0.05	0.12	0.24	0.27	0.42	0.03	0.11
Environmental investments	0.45	1.24	4.15	7.50	9.40	12.75	1.28	1.52

Source: Ministry of Environmental Protection and Physical Planning, 2002.

Table 2.6: Revenues from environmental taxes and charges, 1997-2001 (Dinars 1997-1999; and DM 2000-2001)

	1997	1998	1999	2000	2001
Total	21,000	4,547,000	7,064,000	1,130,000	1,905,000
Pollution charges	21,000	307,000	755,000	121,000	226,000
Investment charges	..	4,240,000	6,309,000	1,009,000	1,679,000

Source: Ministry of Environmental Protection and Physical Planning, 2002.

2.8 Conclusions and recommendations

Recommendations to Serbia

Even though a broad range of instruments may well have great potential for achieving greater environmental effectiveness and economic efficiency, economic instruments and incentives have not yet found an appropriate place in Serbia's environmental policy. There are several reasons why proposals for more economic instruments have been delayed, modified or simply abandoned.

As for existing economic instruments, one of the major obstacles to improving their efficiency is poor fiscal discipline, i.e. the prevalence of the grey economy. Improvements in fiscal discipline have recently taken place through the introduction of new taxation laws and the ongoing reform of the tax administration. At the same time, a number of enterprises owing fines and charges are insolvent. The financial situation of these enterprises could be improved by the ongoing restructuring and privatization, which would allow for stricter payment arrangements in the near future. Other major problems concerning implementation and effectiveness are the legislative gaps in enforcement; organizational problems in collecting the charges mean that only a small part of the imposed charges are actually collected; the limited possibilities for inspectorates to impose sanctions for non-compliance; and the lack of political support for the necessary action in some cases. In addition, official measuring equipment is lacking, and the inspectorates base their charges on enterprises' own measurement. Enterprises, however, generally prefer to pay fines rather than implement the necessary abatement or preventive measures.

<u>Recommendation 2.1:</u>
The Ministry for Protection of Natural Resources and Environment should:

(a) *Together with the Ministry of Finance and the Economy, increase the use of economic instruments for environmental protection, specifically emission charges and product charges;*

(b) *Give more emphasis to the application of economic instruments in order to increase their use and effectiveness. A programme for the systematic monitoring and evaluation of existing economic instruments should be launched; and*

(c) *Start drafting by-laws to apply the polluter and user pays principles and economic instruments.*

Population poverty and industrial decline in the 1990s have kept user charges very low. They do not even cover the cost of investments and the maintenance of service companies. Despite low tariffs, collection rates are also very low, even below 50%. Increases in charge rates in line with increases in the purchasing power of inhabitants are inevitable for both environmental and economic reasons. Although the reduction of price controls is generally a politically and socially sensitive issue where incomes are low, the long-term benefits of improved services, environmental quality and more efficient resource use should exceed the initial price increases.

<u>Recommendation 2.2:</u>
The Government should give municipalities and public enterprises the possibility of setting their own tariffs for municipal services in order to operate on a full cost-recovery basis. Tariffs should be gradually increased to consumer affordability levels, with the possibility of subsidies for lower-income groups.

Strict enforcement is needed to increase collection rates. It is common for enterprises to prefer regular payment of the low non-compliance fines rather than implement the necessary abatement or preventive measures, as the latter may be more expensive in the end. The present level of fines cannot even cover the administrative costs of fining.

<u>Recommendation 2.3:</u>
The Ministry of Finance and the Economy should increase the efficiency of collection and enforcement procedures by setting higher non-compliance fines.

The earmarking of charges and the redistribution of revenue are of the utmost importance. The Law on Environmental Protection states that the revenue from environmental charges, taxes and fines is to be channelled to a special sub-account within Serbia's budget. But in practice, revenue from the taxes and charges that are in place goes directly to the State budget. There is no environmental account and allocations for environmental expenditure are distributed directly from the State budget.

The financial resources available for environmental projects and activities seem rather limited. The establishment of an environment fund could ensure

that revenue collected through environmental taxes, charges and fines is spent on environmental protection. The fund would use the revenue to finance investments and other projects to achieve environmental objectives.

The draft law on the environmental protection system proposes the establishment of a budgetary fund for certain priority projects related to environment and nature protection and to achieve the objectives of special acts or international agreements.

Recommendation 2.4:
As soon as the law on the environmental protection system has been adopted, the ***Government of Serbia*** *should take the necessary steps to establish and implement an environmental budgetary fund to channel financing for environmental purposes. Its statutes, structure, and management and operational procedures should be set out in an additional regulation. The fund should aim at generating funds from national and international sources, and not simply be a disbursing mechanism, but also take into account the environmental objectives targeted by economic instruments.*

Recommendations to Montenegro

Montenegro's Law on the Environment defines the polluter pays principle and gives a basis for the introduction of economic instruments for environmental protection. The Law foresees the introduction of pollution charges on air emissions, fossil fuels, substances that harm the ozone layer, lubricant oils, the production and disposal of hazardous waste, and taxes on motor vehicles and aeroplanes. In practice, however, the above-mentioned instruments have not yet been properly implemented. Several by-laws (regulations and decrees) needed to regulate legally the implementation of economic instruments are lacking.

In addition, most enterprises do not have monitoring equipment and pay a fixed amount per month. The charges do not provide real incentives for enterprises to invest in cleaner technologies or monitoring equipment, since the cost of investing in new technology is higher than the charges.

User charges, i.e. payments for public services, are mainly used to cover the operating and maintenance costs of these services. But social considerations keep the user charges below the full cost-recovery level. They have increased recently, but still do not reflect the real cost. Other complicating factors are poor revenue collection and the marginal cost of fines for non-compliance.

Recommendation 2.5:
The Ministry of Environmental Protection and Physical Planning, together with the Ministry of Agriculture, Forestry and Water Management and the Ministry of Finance, should analyse their existing economic instruments and put more emphasis on their application. Important factors in the analysis of existing economic instruments are environmental effectiveness (i.e. the extent to which instruments contribute to the achievement of environmental goals), economic efficiency, administration and compliance costs, use of revenues, and the incentive effects.

The Law on the Environment stipulates that all environmental charges, taxes and fines are to be channelled to a special sub-account ("ecological account") within Montenegro's State budget. In practice, there is no such account, and allocations for environmental expenditures are distributed directly from the State budget.

The financial resources available for environmental projects and activities are limited. The Ministry of Environmental Protection and Physical Planning collects the so-called eco-taxes – pollution charges and investment charges – and fines. The revenue is directly channelled to the State budget of Montenegro, and is not used for environmental investments at all. The establishment of an environment fund would help to ensure that revenues collected through environmental taxes, charges and fines are spent on environmental protection. The fund would use the revenue to finance investments and other projects to achieve environmental objectives.

The fund could be established as a special ecological account within the State budget, subject to regular State budget procedures, under the supervision of the Ministry of Finance, and distributed according to the environmental priorities set by the Ministry of Environmental Protection and Physical Planning. The priorities should also be included in the future NEAP and updated regularly.

Recommendation 2.6:

(a) *The **Government of Montenegro** should take the necessary steps to establish a special sub-account within its State budget to channel financing for environmental purposes, in line with the Law on the Environment.*

(b) *To make environmental investments more effective, priority projects need to be identified by the Ministry of Environmental Protection and Physical Planning and should be viewed in the context of the preparation of the national environmental action plan.*

Chapter 3

INFORMATION, PUBLIC PARTICIPATION AND AWARENESS-RAISING

3.1 Access to Environmental Information

Yugoslavia

In principle, all Yugoslavia's government-related activities are open to the public. Article 52 of the 1992 Constitution provides the right to environmental information and to a healthy environment. There is no specific law on access to and provision of environmental information, but the 1990 Federal Law on the Public Information System guarantees all natural and legal persons free access to public information. The Federal Law on the Basic Principles of Environmental Protection also lays down principles on public participation. All public authorities and legal entities have to make available to the public all information in their possession, with the exception of State, military, official or business secrets. There are no formal requirements governing the quality of information provided, and there are no formal guidelines on how to request or give information. Both the federal and the republics' laws prescribe fines for anyone who withholds information without justification.

Yugoslavia is not a Party to the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice on Environmental Matters, but in November 2001 it announced that it hoped to be ready to accede in the first half of 2003.

Serbia

Serbia's Constitution does not proclaim public rights to environmental information. It was written before the Federal Constitution, and has not been updated or harmonized with the Federal Constitution. However, the Serbian Law on Environmental Protection provides the right to access to environmental information. In particular, its article 8 grants the public the right of access to environmental quality data. The public must also be informed about real or potential threats to the environment. Article 9 outlines the foundation of a separate environmental information system, and according to related regulations, the Government is obliged to establish an environmental information system within six months.

A subsequent implementation programme was prepared for the period up to 1995 (No. 78/92). It prescribed the establishment of an information centre, a monitoring centre, a special agency to run the system and links with other relevant databases both within and outside Serbia. In addition to this, the 1996 Law on the Information System calls for the creation of a joint database that would standardize data for all State administration institutions. The whole programme is still in the early stages of implementation. To make up for the absence of a functional information system, the Federal Hydrometeorological Institute has started to develop an environmental information system.

In addition, the REC Country Office in Belgrade established the Environmental Resource Centre (ERC), which provides relevant environmental information to the public. The project was funded by the Japan Special Fund and supported by the (then) Directorate for Environmental Protection (now the Ministry for Protection of Natural Resources and Environment) and the City of Belgrade. The Directorate helped to fund the project by supporting the Eko Documentation, Information and Media Centre (Eko-DIMeC). The Executive Board of the City of Belgrade provided the office space. ERC has its working space, library, business and press conference room, bulletin, web portal and Internet café. The web portal (http://www.erc.org.yu), still in development, will provide interactive targeted information and will include environmental news and information on environmental events, governmental institutions, scientific bodies and donors whose activities are related to the environment, projects and experts, the state of the environment through the database, questionnaires and forums of the Republic Hydrometeorological Institute.

Montenegro

Article 19of the 1992 Constitution of Montenegro provides the right to environmental information. The Constitution proclaims the right to a healthy environment and to timely public access to environmental information.

A specific law on access to information does not exist, but the Law on the Environment provides a basis for future legislation. Still, there is a delay in the adoption of by-laws, essential for the implementation of the law.

Disseminating information is the responsibility of State agencies only (Law on the Environment, art. 12). Enterprises indirectly inform the public about environmental pollution via the transmission of data from State agencies to the information system (Law on the Environment, art. 26). However, there are no time constraints for this procedure. Enterprises engaged in activities that need an environmental impact assessment are required to submit reports on their environmental protection programmes to the local authorities. These reports are then submitted to the Ministry of Environmental Protection and Physical Planning in regular annual reports, which are available to the public. The Law on the Environment also provides for the establishment of a Montenegrin environmental information system through the Ministry of Environmental Protection and Physical Planning, but for financial reasons the project has not been implemented. However, the Republic Hydrometeorological Institute (Montenegrin Hydromet) has developed a web site to provide the public with relevant information, although this is rather limited, also because of budget constraints. The web site can be found at http://www.meteo.cg.yu. The Centre for Ecotoxicological Research of Montenegro (CER) also plans to create a web site to provide access to monitoring information.

3.2 Sources of Environmental Information: Monitoring

Introduction

Before 1991, the Federal Hydrometeorological Institute and the hydrometeorological institutes of the (then) six republics were in charge of monitoring the state of air and water. The Federal Hydrometeorological Institute was primarily a coordination unit, with the other six carrying out monitoring and research. The Federal Hydrometeorological Institute was also responsible for international and regional cooperation on hydrological, meteorological and air quality issues and it was the leader in designing a national network that included not only hydrological, meteorological and air quality data but also data on transboundary water management.

After the break-up of the former Yugoslavia, the relationships among the institutes at different levels deteriorated. Regular communication among them has only recently resumed.

Yugoslavia

Overall the Federal Hydrometeorological Institute is responsible for the interpretation and analysis of data collected by the republics' institutes. According to the Law on Hydrometeorological Affairs of Interest to the Country, it is responsible for meteorological, hydrological, water and air quality issues, and it participates in transboundary projects and monitoring programmes. The Federal Hydrometeorological Institute remains the coordinator for all relevant international programmes involving international data exchange, and it is itself involved in a number of different international programmes for Yugoslavia. These include:

- Water quality monitoring and the protection of the Danube River against pollution in the framework of the Bucharest Declaration (on the cooperation of the Danubian Countries on problems of the Danubian water management). It also participates in international cooperation related to the Sofia Declaration (Convention on Cooperation for the Protection and Sustainable Use of the Danube River);
- Air pollution monitoring within
  - The Global Atmosphere Watch, under the auspices of the World Meteorological Organization (WMO);
  - The Cooperative Programme for Monitoring and Evaluation of Long-range Transmission of Air Pollutants in Europe (EMEP); Assessment of the emission of pollutants (sulphur dioxide and nitrogen oxides) in the EMEP 50-km resolution grid used for the 1999 EMEP model. The Federal Hydrometeorological Institute has delivered EMEP data to the UNECE secretariat since 1985. The republics' institutes are responsible for the EMEP

stations, and cooperation between them and the Federal Hydrometeorological Institute has been good;

- The Programme for the Assessment and Control of Pollution in the Mediterranean Region (MED-POL) under the auspices of the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) (http://irptc.unep.ch/gmn/014_map.htm); and
- The early warning system for radioactive atmospheric pollution;

- In cooperation with government and scientific institutions, the preparation of long-term programmes for the implementation of the Convention on Long-range Transboundary Air Pollution; and
- The study of greenhouse gases emissions at the national level, in collaboration with the National Observatory in Athens and the Greek Ministry of the Environment.

In 2001, the International Commission for the Protection of the Danube made a survey at 19 sampling locations. The Federal Hydrometeorological Institute, through its Department for Water and Air Quality, took part in this exercise, but due to a lack of financing, it was able to take samples at only 13 of the 19 locations. At the request of the Federal Hydrometeorological Institute, the Republic Hydrometeorological Institute of Serbia surveyed the Danube's water quality, taking five different sample types: (i) water, (ii) sediment, (iii) biology, (iv) suspended solids and (v) mussels. The Federal Hydrometeorological Institute is also carrying out studies on the propagation of different pollutants in the vicinity of highly polluting enterprises.

After data quality control, the Federal Hydrometeorological Institute analyses, processes and archives data. The results are published on the Web in a user-friendly and comprehensive format for the public. The web address is http://www.meteo.yu. The database is updated four times a day.

The Federal Hydrometeorological Institute consists of four departments:

- The Meteorological Watch Department;
- The Hydrological Department;
- The Department for Water and Air Quality and the Early Warning of Accidents. This Department deals, inter alia, with the surface, underground and coastal water monitoring network, the accident emergency warning system, and the standardization and application of methods for water quality sampling and parameter analysis; and
- The Meteorological Research Department (climate research, agro-meteorological research, laboratory for instruments and observation methods and the National Information Database.

There are three main federal laws covering the monitoring of the state of the environment: the 1998 Law on the Basic Principles of Environmental Protection; the Law on the Water Regime (No. 59/88); and the Law on Hydrometeorological Affairs of Interest to the Country (Nos. 18/1988 and 63/1990).

Since 1999, the Federal Hydrometeorological Institute has been faced with inadequate financing, a lack of modern and adequate equipment and a lack of staff. Educated young people are attracted by better salaries elsewhere, within but also outside of the country. However, the Institute's team continues to do what it can to provide a full range of environmental data on air and water quality (health) parameters in Yugoslavia.

Monitoring in Serbia

Under the framework Law on Environmental Protection, Serbia is responsible for monitoring air, water, waste and biodiversity. The Republic Hydrometeorological Institute (Serbian Hydromet) and the public health institutes manage two complementary networks for monitoring the state of the environment.

Air monitoring

The Law on Environmental Protection calls for air quality monitoring by measuring emissions and imissions. A combination of republic hydrometeorological stations, urban hydrometeorological stations and local urban air quality stations carry out these measurements. Measurements are taken in accordance with the 1992 Regulations on Limit Values, Imission Measuring Methods, the Selection of Sample Spots Criteria and Data Collecting and the 1997

Regulations on Emission Limit Values, Methods and Time Frame for Measuring and Data Noting.

SO_2 and soot are measured at 92 sites, total deposited matter at 108 sites, NO_x at 39 sites and traffic pollutants at 10 sites. Total suspended particulate matter is monitored in Belgrade and in Nis. Heavy metals are monitored at 27 measurement points, of which 17 are located close to highly polluting industries (see also chapter 6, on air management).

Water monitoring

The water monitoring network was created under the former Yugoslavia. Groundwater quality is measured only in central Serbia and Vojvodina, not in Kosovo. Due to a lack of financing, monitoring operations were reduced and only the most important parameters for pollution retained. These include measuring points along transboundary rivers and other important rivers located close to highly polluting enterprises.

Following EU standards, 72 parameters are listed in the monitoring programme, but, in fact, only the most representative parameters are systematically monitored. These are grouped into five categories:

- Hydrological (level, flow, speed, surface, temperature);
- Meteorological (cloudiness, precipitation, wind);
- Microbiological (faecal, coliform, aerobe);
- Saprobic (saprobic index, and degree); and
- Physico-chemical (pH, biological oxygen demand, suspended matter).

Water monitoring is organized by catchment area around six regional centres, each with six to eight staff members. The teams, which are well trained and competent, are responsible for equipment maintenance, gauging, data collection and reporting, quality sampling and basic primary analysis. Basic quality analysis is done by the field teams with appropriate but rudimentary equipment. More complex analysis takes place in the central laboratory of Serbian Hydromet in Belgrade. In all cases, equipment is old and inefficient. More complex analysis is contracted with the well-equipped and efficient laboratory of the Public Health Institute.

Discharges are monitored at 283 level measurement stations, and they are evaluated for 190 stations. Data are reported to the central Serbian Hydromet office daily for 55 stations and monthly for the other 228. Where discharge is evaluated, gauging is usually performed monthly. Groundwater level and temperature are measured weekly at 35 springs. Water quality is monitored monthly at 156 stations on 83 rivers. Most parameters are measured monthly, some quarterly. Daily reporting of the 17 main parameters is available for 10 stations. A biotic index is evaluated quarterly.

Quality monitoring on the Danube and Sava rivers in the Belgrade district is part of the Danube Commission's programme. For some stations on the main rivers (Danube, Sava, Tisza and Morava), sediment analyses are performed once a year. Groundwater quality is assessed once a year at 35 springs and 36 lakes or reservoirs (see also chapter 5, on water management).

Waste monitoring

All polluting enterprises send monthly reports of their emissions to the inspectorate. The information is not stored electronically so efficient retrieval is impossible. Nevertheless, the inspectorate is organizing a database on enterprises' waste storage. On request, the inspectorate can provide information on a specific hazardous waste stored in Serbia, but not by enterprise. A project to post this database on the Web is foreseen, but it has been postponed due to a lack of financing (see also chapter 7, on waste management).

Institutional and legislative framework

Overall, the Republic Hydrometeorological Institute is responsible for monitoring air, water and other hydrometeorological issues in Serbia and is consulted on projects for the extraction of materials from riverbeds. The public health institutes in major towns (Belgrade, Novi Sad) are responsible for monitoring air, noise, water and groundwater in urban areas. The Recycling Agency has the main responsibility for industrial waste management, for monitoring, for controlling the use of secondary raw materials and for keeping the requisite records.

The legislative framework for monitoring the environment in Serbia rests on five laws, including: the Law on Environmental Protection (monitoring rules); the Law on the Handling of Waste (waste measurements); the Law on Waters (ground and surface water monitoring); the Law on Agricultural

Land (soil monitoring); the Law on the Transport of Hazardous Substances (waste monitoring). Several by-laws have also been adopted in connection with these laws.

The monitoring of the state of the environment is based on regular measurements and analyses. The following institutions are involved in the monitoring programme:

- The Ministry for Protection of Nature Resources and Environment;
- The Ministry of Agriculture and Water Management;
- The Republic Hydrometeorological Institute;
- The public health institutes; and
- The Universities of Belgrade, Novi Sad and others.

Monitoring in Montenegro

The monitoring system is based on air pollution monitoring from mobile and stationary sources; surface and underground water monitoring; and radioactivity, biodiversity and soil pollution monitoring. Data are collected through the Republic Hydrometeorological Institute, the Institute for Nature Protection, the public health institutes, the Institute for Marine Biology and the Centre for Ecotoxicological Research of Montenegro (CER). Once collected, the data are aggregated by the Ministry of Environmental Protection and Physical Planning.

The Ministry publishes a report on the State of the Environment based on these data. The document is available in all Montenegrin municipalities and upon request. The Ministry also has a project to establish a web site to post on-line both the report and other environmental information, but this project is waiting for financing.

Air monitoring

The Ministry of Environmental Protection and Physical Planning is responsible for establishing an air monitoring programme. This is supposed to be done in consultation with all the responsible institutes, but, in fact, is not. The Republic Hydrometeorological Institute is responsible for implementing the programme, but it indicated during interviews that the monitoring programme is inadequate, especially for urban areas like Podgorica. The programme currently relies primarily on random measurements, but Montenegrin Hydromet suggests that the monitoring should be continuous and regular. The monitoring system has 19 measuring stations.

The Centre for Ecotoxicological Research also monitors air quality with its mobile laboratory. It analyses pollutant emissions upon request, issues certificates for segments of the technological process, and carries out toxicological analysis in the event of an accident.

Montenegrin Hydromet monitors stationary sources. Its measurement programmes include:

- Smoke and sulphur dioxide;
- Nitrogen oxides, tropospheric ozone and particulate matter (PM);
- The chemical composition of precipitation;
- Sediment;
- PM and heavy metals in precipitation and air (as a part of MEDPOL);
- SO_2 and NO_x in a transboundary context (as a part of EMEP); and
- Radioactivity-gamma radiation (see also chapter 6, on air management).

Water monitoring

The Centre for Ecotoxicological Research undertakes research on specific pollutants for new water-supply installations, the contamination of coastal seawater, and toxic materials in waste water. It also monitors surface and groundwaters.

Montenegrin Hydromet operates and maintains a network of measuring stations. Thirty-six stations measure surface water parameters; eleven stations the natural accumulation parameter and nine stations groundwater. Under MEDPOL, 19 stations measure coastal seawater quality, using standard physico-chemical, microbiological and saprobic parameters in surface water and deep water. Montenegrin Hydromet follows the same requirements as the Federal Hydrometeorological Institute, but, due to the lack of financing, its management board selects only the most important parameters to be measured at a certain geographical point, e.g. the vicinity of the aluminium plant and underground water flows around Skadarsko Jerezo. Montenegrin Hydromet could not provide a reliable picture of water quality.

The public health institutes within the Ministry of Health are supposed to monitor the quality of

drinking water, but CER also carries out toxicological research on drinking water.

Seawater is monitored by the Institute of Marine Biology in Kotor for biological parameters and through CER for chemical parameters (see also chapter 5, on water management).

Waste Monitoring

There is no waste monitoring in Montenegro (see also chapter 7, on waste management).

Institutional and legislative framework

Montenegrin Hydromet is responsible for air, water and waste monitoring and meteorological research in Montenegro. The public health institutes are responsible for monitoring air, water and food for health-related problems, e.g. microbiological contamination. The Institute for Nature Protection is responsible for monitoring biodiversity. The Institute for Marine Biology is responsible for coastal zone monitoring and research. Due to a lack of financing and obsolete equipment, these institutes might have to reduce systematic monitoring of the various media.

The Centre for Ecotoxicological Research also undertakes monitoring, but it works on a commercial basis. It was created in 1998 by the Ministry of Environmental Protection and Physical Planning and received a significant amount of money to purchase state-of-the-art laboratory equipment. CER is able to work on a contractual basis, but Montenegrin Hydromet is not.

Funding is also provided by the Ministry of Environmental Protection and Physical Planning. CER usually receives approximately 80% of the allocated budget, and the remaining 20% goes to Montenegrin Hydromet for water and air monitoring. In 2002, CER received the entire budget with the exception only of salaries for the staff within Montenegrin Hydromet.

The legislative basis for monitoring in Montenegro is derived from its 1996 Law on the Environment (general provisions) and the Federal Law on Hydrometeorological Affairs of Interest to the Country, which stipulates that Montenegrin Hydromet is the competent authority for implementing the Law, that is, for monitoring air, collecting and exchanging data, and establishing the hydrometeorological information system.

3.3 Public participation and public awareness

Serbia

Public participation, awareness-raising and education

The general provisions of the Serbian Constitution provide broad possibilities for public participation. According to the Constitution, the work of the State and other agencies and institutions, as well as high-ranking officials, can be criticized publicly. Citizens have the right to make requests, petitions, and proposals, receive an answer and not to be called to account for taking such action. Unfortunately, those broad constitutional possibilities are not explicitly reflected in either the 1991 Law on Environmental Protection or in the 1992 Regulations on environmental impact assessment (see Chapter 1, on the decision-making framework for environmental protection). Those acts do not include any provisions for public participation. According to NGO experts, there are no opportunities for the involvement of affected parties and the interested public in the EIA procedure.

The new draft law on the environmental protection system does contain an article that proposes the participation of the public in strategic environmental assessments (SEA) and environmental impact assessments (EIA). Participation of the public would be ensured through the presentation of spatial and urban plans and programmes where it concerns SEA, and through public hearings and debates in the case of EIA.

In December 2001 a media campaign was launched in Serbia by the Organisation for Security and Cooperation in Europe (OSCE) to make the public aware of the need to address environmental problems. The "Pollution Demands a Solution" campaign focused on the various ways pollution can manifest itself and on how it affects the population. It was the first step in a public debate on the draft environmental law. In January 2002, the draft law was submitted to 160 municipalities for comment. A digest of the law was also included in daily newspapers throughout the country, in order to encourage the people of Serbia to participate in the discussion.

The Serbian Government and Assembly have identified environmental education and awareness-raising as one of the priorities in the environmental

sector. The (then) Directorate for Environmental Protection (now the Ministry for Protection of Natural Resources and Environment) decided to prepare a national programme of environmental education in cooperation with the Ministry of Education and Sport. The aim is to introduce environmental education at all levels, in order to raise people's awareness and to stimulate environmentally sound behaviour.

Montenegro

Public participation, awareness-raising and education

The legal basis for public participation in decision-making is article 2 of the Constitution of Montenegro, which states that sovereignty belongs to the people so they exercise their power both directly and through freely elected representatives. The Montenegrin Constitution guarantees several basic rights which address public participation (the right to expression, association and assembly, the right to information). More specifically, the right to participate in environmental decision-making is proclaimed by the Law on the Environment (art. 7). Public participation is also mentioned in its article 42, which states that non-governmental environmental organizations represent organized public participation in environmental decision-making. However, this Law provides neither procedures nor measures for the implementation of this right.

Although the Regulations on environmental impact assessment (EIA) of 1997 explicitly mention public participation in article 1, decision-making in EIA belongs exclusively to the Ministry of Environmental Protection and Physical Planning. Article 7 of the Regulations provides for public debate with two conditions: public debate is not obligatory and depends on the decision of the Ministry, and it may be organized only for undertakings that could have a powerful influence on the environment. In addition, the conclusions of the public debate are not binding. The way EIA is regulated gives public officials considerable freedom to avoid public participation. So far, there are no signs that the issue of public participation will be regulated in more detail in the future (see also chapter 1, on the decision-making framework for environmental protection).

Public awareness of environmental issues is rather low and is focused mainly on environmental accidents. The public is more interested in political and economic issues.

Environmental subjects are a part of basic education. However, there is still a lack of coherent staff training for integral environmental protection and improvement, as well as for sustainable development, especially at the highest levels of education.

3.4 The role of non-governmental organizations

Yugoslavia

Non-governmental organizations (NGOs) play an important role in fostering the value of a clean environment and the protection of natural resources. According to available statistics, there are 176 environmental organizations in Yugoslavia. Most are very young; 80% were officially registered during the 1990s. The NGOs are involved in different ways in nature protection, education, public awareness-raising and clean-up projects. Some of them are quite weak and define their financial status as very poor.

The Regional Environmental Center for Central and Eastern Europe (REC) acts as the secretariat for the Regional Environmental Reconstruction Programme (REReP). In that role, it supports capacity-building for implementing the Aarhus Convention, mainly through training and workshops for representatives of governmental institutions, NGOs and other stakeholders (see also chapter 4, on international cooperation).

In recent years, environmental NGOs have developed a number of initiatives and networks in the region. One of them is the South Eastern European Environmental NGOs Network (SEEENN), which endeavours to coordinate environmental NGOs on a regional level. Another network that will be formed soon is the SEE NGO Electronic Network, whose goal is a stronger and better organized and coordinated environmental NGO community. For this purpose, an environmental electronic NGO network will be established in Yugoslavia.

Serbia

In Serbia, there are some 100 environmental NGOs. These are particularly important at the local level where they are represented on certain local councils

and are able to influence environmental decision-making. Many NGOs have also established good working relationships with governmental institutions and international organizations that benefit their work in Serbia. Environmental NGOs have significantly raised the level of public awareness about the environment and have contributed to the development of local environmental action plans (see also chapter 1, on the decision-making framework for environmental protection). A number of NGOs (e.g. the Serbian Ecological Society and the Danube Environmental Forum Network) have contributed to an improved dissemination of environmental information through their web sites and publishing activities.

Many of the NGOs operate under difficult conditions caused by chronic underfunding. As a consequence, they tend to be driven by the priorities of external donors. Additional support comes through the REC Country Office in Belgrade, which initiates and distributes small grant projects. All REC granting programmes are publicly announced through daily newspapers and e-media. But many NGOs are still not aware of the possibility of applying for these grants.

Montenegro

The UNDP office in Montenegro has started an NGO capacity-building programme that supports NGOs in addressing environmental and poverty reduction issues. The programme is focused on helping NGOs through training workshops and conferences to develop skills to facilitate the process of social change connected to issues of direct concern to the communities. NGOs are encouraged to form informal coalitions and work either independently at the local level or through the coalition at the republican level. One example is an NGO in the town of Pljevlja, which has a coal mine, a power station and a tailings pond in the vicinity. The NGO, supported by UNDP, is completing studies that are to be used to raise citizens' awareness of existing problems and to help the Government identify ways of reducing the pollution.

In addition, UNDP in cooperation with the Government of Montenegro recently launched the Eco-Development Initiative (EDI). This was a partnership to put sustainable development on top of the agenda by linking government ministries, municipal authorities and civil society. Unfortunately, EDI has recently been stopped for unknown reasons.

3.5 Conclusions and Recommendations

Recommendations to the Federal Government

Recommendations of relevance to information, public participation and awareness-raising for Yugoslavia may be found in chapter 4, on international cooperation, in particular recommendation 4.3.

Recommendations to the Federal Government of Yugoslavia, Serbia and Montenegro

The rise of the environmental NGO community in Yugoslavia is a promising development. However, at the moment, NGOs lack both good networks among themselves and a mechanism for cooperation. There is also little communication between NGOs and the environment ministries. In general, the role of NGOs should be strengthened at all levels.

Recommendation 3.1:
*The **Federal Secretariat** for Labour, Health and Social Care, **Serbia**'s Ministry for Protection of Natural Resources and Environment and **Montenegro**'s Ministry of Environmental Protection and Physical Planning should continue providing support for the establishment of environmental NGO networks and provide NGOs with access to accurate environmental information and the opportunity to participate in environmental decision-making.*

Recommendations to Serbia and to Montenegro

With the exception of the Centre for Ecotoxicological Research of Montenegro, virtually all of the institutes with monitoring responsibilities throughout Yugoslavia suffer from obsolete and inadequate equipment, insufficient training for staff and a lack of resources to remedy the situation. Without the appropriate equipment and the means to carry out monitoring on a systematic and predictable basis, there is no assurance that the data collected are accurate and comprehensive.

Recommendation 3.2:
*The Government of **Serbia**, through its Ministry for Protection of Natural Resources and Environment, and the Government of **Montenegro**, through its Ministry of Environmental Protection and Physical Planning, should provide the resources to update monitoring facilities for carrying out a comprehensive and systematic monitoring of the state of the environment. (see recommendation 6.4)*

Recommendation 3.3:
***Serbia**'s Ministry for Protection of Natural Resources and Environment and **Montenegro**'s Ministry of Environmental Protection and Physical Planning should:*

(a) *Prepare periodic reports on the basis of the data collected and analysed and*

(b) *Provide training programmes for the staff currently employed in the monitoring institutes.*

Water monitoring is currently based on parameters that are essential for human health. Under the Danube Convention, the monitoring of rivers should also take into account other parameters, such as vegetation and animal life in the aquatic environment and along the riverbanks, since these are indicators of the environmental health of the river.

Recommendation 3.4:
***Serbia**'s Republic Hydrometeorological Institute and **Montenegro**'s Republic Hydrometeorological Institute, in cooperation with the Federal Hydrometeorological Institute, should update the water monitoring to include life parameters, such as vegetation and animal ecosystems in the rivers and along the riverbanks. A first step would be to start simple observation studies on the status of the ecosystems close to the riverbanks.*

Public participation is underdeveloped in Serbia, even in local decision-making and EIA procedures. There are currently no provisions for public participation or environmental information in the Law on Environmental Protection or the Regulations on environmental impact assessment. Public participation needs to be further encouraged and developed by strengthening the legal framework. The laws and regulations at local and EIA levels should also be altered to allow for more public participation similar to the situation in other countries.

In Montenegro, the 1997 Regulations on environmental impact assessment explicitly mention public participation, but decision-making in EIA belongs exclusively to the Ministry of Environmental Protection and Physical Planning. Public debates within the EIA procedures are not obligatory and their conclusions not binding. In fact, there is no public participation, and this needs to be introduced. In addition, there is a need to raise public awareness of environmental issues and the EIA process.

Recommendation 3.5:
***Serbia**'s Ministry for Protection of Natural Resources and Environment and **Montenegro**'s Ministry of Environmental Protection and Physical Planning should:*

(a) *Introduce public participation in EIA procedures and should include more provision for public participation in the environmental decision-making procedures in accordance with the Aarhus Convention.*

(b) *Consult **Serbia**'s Ministry of Education and Sport and **Montenegro**'s Ministry of Education and Science on appropriate ways to introduce environmental protection issues into the curricula of primary schools.*

(c) *Raise public awareness of environmental issues through information campaigns, the use of the media, environmental programmes, and cooperation with schools and universities.*

Recommendations to Serbia

Several major problems persist in public participation and access to environmental information. The Law on Environmental Protection lays down the establishment of an environmental information system, which has not yet been set up. The absence of this information system has limited both the environmental information available to the public and certain environmental activities. The new draft law on the environmental protection system proposes the creation of an information system on natural resources and environmental protection, to ensure efficient monitoring and recording of natural resources and the optimal management of the environment.

Recommendation 3.6:
The Ministry for Protection of Natural Resources and Environment should establish an environmental information system. This system should provide data and information on the status and the protection of the environment, which should be made available to decision makers and to the public.

Recommendation 3.7:
The Ministry for Protection of Natural Resources and Environment should regularly prepare a report on the state of the environment and submit it to the Government of Serbia. The Government should submit the report to the National Assembly, and it should be accessible to the public.

Recommendations to Montenegro

There is lack of clarity about the distribution of responsibilities for monitoring among the Republic Hydrometeorological Institute, the Institute for Nature Protection, the public health institutes, the Institute for Marine Biology and the Centre for Ecotoxicological Research. In addition, there is very little sharing of information among the institutes, even though this is mandatory.

Recommendation 3.8:
The Ministry of Environmental Protection and Physical Planning, the Ministry of Health and the Ministry of Agriculture, Forestry and Water Management should define clearly the responsibilities of the different institutes within Montenegro so as to rationalize environmental monitoring.

Chapter 4

INTERNATIONAL COOPERATION

4.1 Driving forces and objectives of international environmental cooperation

On 1 November 2000, the General Assembly admitted Yugoslavia to membership of the United Nations. On 10 September 2001, the Security Council of the United Nations unanimously voted to lift the remaining sanctions imposed by the international community on Yugoslavia. These acts finally ended the restrictions on the participation in international cooperation of Yugoslavia for almost a decade. It also marked a new turning point in the international environmental cooperation of the country.

While Yugoslavia has normalized its international cooperation and its relation with international organizations, the process of political and economic transition is still ongoing. The main point of reference in the process of constitutional and State reform is the recently concluded Agreement on Principles of Relations between Serbia and Montenegro within the framework of a State Union, signed in Belgrade on 14 March 2002 by the representatives of Yugoslavia, Serbia and Montenegro, and by the European Union High Representative for Foreign Policy and Security. Since then, the Agreement has been ratified by the three assemblies. A new constitutional charter in accordance with the organizational set-up and competence laid down in the Agreement is currently under development.

Yugoslavia is aiming at full participation in the process of European integration, and a basic cooperation agreement has been signed with the European Commission, allowing Yugoslavia to participate in Community Assistance for Reconstruction, Development and Stabilization (CARDS). The main goal of cooperation is the rapid conclusion of a Stabilisation and Association Agreement (SAA) with the European Union. Another important aspect of effective integration is the increased regional cooperation, in which Yugoslavia is actively engaged within the framework of the Stability Pact for South Eastern Europe, which it joined as a full member on 26 October 2000. Within the Stability Pact, the most important environmental projects are implemented under the Regional Environmental Reconstruction Programme (REReP).

International cooperation on environmental protection and sustainable development clearly depends on the country's overall international relations. For this reason, Yugoslavia's isolation had led to a reduction in official environmental cooperation and exclusion from international forums, such as the United Nations. At the same time, some environmental cooperation among experts and non-governmental organizations was able to continue. Environmental cooperation did serve as a bridge-builder between communities and countries. Today, a very active national, regional and international environmental cooperation is contributing to the sustainable development of the country, and to the ongoing reconstruction and stabilization, and will therefore accelerate the process of association with the European Union.

Yugoslavia's main strategic goal in international cooperation is to move forward together with the rest of the region, through full reintegration into the international community, the achievement of a sustainable economy and accession to the European Union in the long term.

4.2 Institutional arrangements for international environmental cooperation

Introduction

The main State institutions currently involved in international environmental cooperation are situated both at the federal level and in the constituent republics. A special situation applies to the province of Kosovo and Metohija, which remains under the interim administration of the United Nations, through the United Nations Interim Administration Mission in Kosovo (UNMIK).

Under the 1992 Yugoslav Constitution, it is the Federation that has State sovereignty. In performing their duties and organizing authority in

their territories, the constituent republics must be guided by the principles set by the highest federal legal act. Article 77 of the Constitution confirms the basic international environmental cooperation obligations, including environmental protection; the atmosphere and watercourses of national interest and international waters; territorial waters, with reference to the international relations of Yugoslavia; navigation on waters under an international or intergovernmental regime; international relations; border-crossing and control of the circulation of goods, services and passengers across the border; the defence and security of Yugoslavia; and the control of animals and plants crossing State frontiers.

The current situation is characterized by administrative and political reorganization and State reform. Clearly, Yugoslavia is the international legal subject (person), and participates as such in multilateral environmental agreements. However, the recently concluded Agreement does not include environmental protection among the future competences of the Union's Ministries. Foreign affairs and international economic relations will remain with the Federal State, and it is expected that international environmental issues will be represented in this way, though this is still not sure.

Current actors

At the federal level, the Federal Secretariat for Labour, Health and Social Care, created in 2001 as the successor of the former Federal Ministry for Health and Social Policy, is currently one of the main institutions involved in international environmental cooperation. For example, the focal point and competent authority for the Basel Convention are situated within the Secretariat. The Secretariat is currently also in charge of the exchange of information on environmental impact assessment in a transboundary context and the issuance of export or transit permits for radioactive material and poisonous substances.

Other federal institutions currently involved in international cooperation are the Department for Water Resources of the Federal Ministry of the Economy, which authorizes and inspects the use of international waters and monitors transboundary impacts, and the Federal Ministry for Foreign Economic Cooperation, which acts as the national coordinator for the Stability Pact and its REReP. As far as ratification of international agreements is concerned, the current Law on Concluding and Realizing International Agreements in Yugoslavia requires a decision by the federal Executive Council (the Federal Government), and the formal collection of opinions from at least three federal institutions, such as the Ministry of Foreign Affairs, the Ministry of Finance and the Ministry of Justice.

In Serbia, on 19 June 2002, the National Assembly formally established a new Ministry for Protection of Natural Resources and Environment. The new Ministry replaces the Directorate for Environmental Protection of the former Ministry of Health and Environmental Protection, which had been playing a proactive role in international cooperation, and had engaged in various activities with the support of the international community. At present, the draft law on the environmental protection system is awaiting parliamentary adoption. This draft law is aimed at implementing all relevant international environmental agreements, and is harmonized with European Union legislation in areas such as integrated pollution prevention and control and environmental impact assessment. The Serbian Ministry has also established cooperation with the International Commission for the Protection of the Danube River and the Sofia Convention, through the Federal Ministry of Foreign Affairs. It has developed direct cooperation with the Italian Ministry of the Environment, with Slovenia and with the former Yugoslav Republic of Macedonia.

In Montenegro, since the government reorganization in July 2001, the Ministry of Environmental Protection and Physical Planning has been responsible for the development and implementation of environmental policies. A Senior Adviser for International Cooperation is on the staff of the Division for Environmental Policy.

By resolution 1244 (1999) of the United Nations Security Council, the United Nations established an "international civil presence in Kosovo in order to provide an interim administration for Kosovo". The Resolution is the basis for the establishment and operation of UNMIK.

International cooperation

In the current situation, various operational channels of international cooperation have been opened, with different degrees of effectiveness. On some issues international cooperation passed through the Secretariat for Labour, Health and Social Care, as mentioned above. On others, Serbia's and Montenegro's ministries coordinate and communicate through the Ministry for Foreign

Economic Cooperation (e.g. REReP) or through the Ministry of Foreign Affairs (e.g. International Commission for the Protection of the Danube River). In order to establish workable relations, some international organizations communicate directly and in parallel with both the republican and the federal institutions. Finally, for technical cooperation and assistance, Serbia and Montenegro sometimes cooperate directly with the partner country or organization.

The situation can be further illustrated by the example of the relations of Yugoslavia with the Global Environment Facility (GEF). Currently, Yugoslavia has designated two operational focal points for GEF, situated in the environment ministries of Serbia and Montenegro. At the federal level, there are three political focal points, currently situated in the Secretariat for Labour, Health and Social Care, in the Ministry of Foreign Economic Cooperation, and in the Sector of Multilateral Affairs of the Federal Government. GEF, however, usually requests one submission for projects covering the whole of a country's territory. Given the complexity of the multi-layered and multi-institutional approach in Yugoslavia, the decision-making procedure is often complicated, confused and time-consuming.

There are, in addition, other problems associated with the implementation of international agreements. For example, responsible institutions for implementation have not been identified for all agreements, particularly for those ratified before 1978. Some of the former responsible institutions no longer exist, some obligations deriving from international agreements are regulated by a number of different federal and republican provisions, and there is a need for institutional strengthening, capacity-building, and technical and financial support for implementation.

4.3 Cooperation in global and regional environmental agreements

Yugoslavia is a Party to numerous multilateral environmental agreements (MEAs), concluded at the regional or global levels. To several of these, Yugoslavia is a Party by succession to the treaties ratified by the former Socialist Federal Republic of Yugoslavia. During the period of international sanctions, official cooperation in these multilateral treaties was restricted or interrupted. A considerable number of other treaties – from the year 2000 onwards – have subsequently been ratified by the Federal Republic of Yugoslavia in its own capacity. The international seminar on the implementation of eight MEAs in Yugoslavia, co-organized by the United Nations Economic Commission for Europe, the United Nations Environment Programme, the Federal Ministry of Foreign Affairs and the (then) Serbian Directorate for Environmental Protection in November 2001, marked a significant turning point in cooperation in international agreements.

The following section gives an overview of the status of implementation of some of the most relevant MEAs. A complete list of MEAs to which Yugoslavia is a Party can be found in annex II. For virtually all of the conventions to which Yugoslavia is a Party, problems in implementation have arisen as a result of frequent changes in government structures and a lack of harmonization between the respective federal and republic competencies.

Conventions related to the conservation and sustainable use of biological diversity

Yugoslavia ratified the Convention on Biological Diversity in early 2002. A number of legal acts are in force in the country relating to the conservation and sustainable use of biological diversity, in particular in the republics, within their environmental protection laws, legislation on protected areas, hunting, fisheries, forestry or the control of trade in wild fauna and flora. Yugoslavia is currently developing its national environmental action plan (NEAP), and biodiversity conservation and sustainable use should become one of its main priorities. A national biodiversity strategy and action plan are still awaiting development (see chapter 9, on biodiversity conservation and nature protection).

Yugoslavia has also been a Party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) since early 2002. It has already designated a management authority (the Federal Secretariat for Labour, Health and Social Care) and four scientific authorities. A major challenge to the implementation of CITES will be improving harmonization between environmental and foreign trade regulations, as well between Yugoslavia and its constituent republics.

Yugoslavia has not yet ratified the Bonn Convention on the Conservation of Migratory Species of Wild Animals. However, ratification is planned in the short term. It has also not yet ratified the Bern Convention on the Conservation of European Wildlife and Natural Habitats concluded

under the auspices of the Council of Europe. The ratification is planned as soon as Yugoslavia is admitted to full membership of the Council of Europe, which is expected in the near future.

Yugoslavia is a Party to the Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat, which was ratified by the former Socialist Federal Republic of Yugoslavia, with a succession statement presented by Yugoslavia in 2001. So far, four wetlands of international importance have been designated (Ludasko Lake, Obedska Bara, Skadarsko Jezero, and Stari Begej/Carska Bara Special Nature Reserve).

The ratification of the Cartagena Protocol on Biosafety can be considered as one of Yugoslavia's priorities. The National Council for Biological Safety has already been constituted, and the operative organ within the Federal Ministry for Economy and Internal Trade is the Federal Bureau for Plant and Genetic Resources. The basic federal act is the Law on Genetically Modified Organisms (Nos. 21/01 and 24/98). This Law is intended to determine conditions for the restricted use of GMOs, their production and internal trade.

Conventions on the protection of the atmosphere

Yugoslavia ratified the United Nations Framework Convention on Climate Change in 2001. It has not ratified the Kyoto Protocol, and no specific action for its ratification has been undertaken. Yugoslavia has begun preparation of a project to enabling it to prepare its first national communication to the Convention, financed through GEF and implemented by UNDP, in cooperation with the Serbian and Montenegrin Ministries as the executing agencies. The current focal point is the Federal Hydrometeorological Institute.

Yugoslavia is a Party to both the Vienna Convention on the Protection of the Ozone Layer and its Montreal Protocol, ratified by the Socialist Federal Republic of Yugoslavia. The four amendments to the Montreal Protocol have not yet been ratified, but ratification is planned. With the assistance of the Multilateral Fund, an Ozone Office has been established in the Federal Secretariat of Development and Science. The Federal Secretariat for Labour, Health and Social Care is responsible for issuing licences for the import of ozone-depleting substances (ODS). Due to past restrictions in international cooperation, the Yugoslav authorities were late in starting the State programme for phasing out ODS in comparison with other countries. However, the programme has now been prepared and accepted by the Multilateral Fund, and implementation has begun (through six programmes).

The Socialist Federal Republic of Yugoslavia ratified the UNECE Convention on Long-range Transboundary Air Pollution in 1986, and the Federal Republic of Yugoslavia succeeded to it in 2001. Yugoslavia is also a Party to the 1984 Geneva Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP). Yugoslavia has not ratified any of the remaining seven protocols to the Convention. The Federal Hydrometeorological Institute is responsible for the implementation of the Convention. There are no plans at the moment to ratify the remaining protocols due to the anticipated costs of implementation.

Conventions on chemicals and hazardous wastes

Yugoslavia signed the Stockholm Convention on Persistent Organic Pollutants in May 2002, and plans to begin the ratification process in 2002. Upon signing the Convention, Yugoslavia became eligible for GEF funding for the development of a national implementation plan. The Federal Secretariat for Labour, Health and Social Care had been the responsible body, but this competence has now been shifted to the Federal Ministry for Economy and Internal Trade. The main problem of implementation is the fragmentation of the legal bases for implementation competences, with the republics being competent for the environmental protection system, and further changes expected.

Yugoslavia has neither signed nor ratified the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade. Currently, the Inspectorate for Toxins of the Federal Secretariat for Labour, Health and Social Care is responsible for coordination. No action has been taken to ratify this Convention.

Yugoslavia ratified the Basel Convention on the Control of Transbounday Movements of Hazardous Wastes and their Disposal in 2000, making it one of the very few international treaties ratified during the period of international sanctions. The Basel Convention is implemented by several federal and

republican laws. The Federal Secretariat for Labour, Health and Social Care is currently acting as the focal point for the Basel Convention, and – together with the Public Health Institute of the City of Belgrade – as the competent authority.

International agreements on water

Although Yugoslavia has not yet ratified the Convention on Cooperation for the Protection and Sustainable Use of the Danube River, ratification is now being considered a top priority and can be expected in the short term. In the meantime, several activities are ongoing or planned, and the Serbian Ministry for Protection of Natural Resources and Environment recently announced the start of regular cooperation with the International Commission for the Protection of the Danube River. Furthermore, Yugoslav experts will participate in the ongoing UNDP/GEF regional project to reduce pollution in the Danube and Black Sea basins.

Yugoslavia is not a Party to the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes, but there are ongoing preparations for ratification. Even though Yugoslavia shares several transboundary waters with neighbouring countries (e.g. Skadarsko Jezero, or river basins such as Sava, Drava or Tisza), the bilateral agreements on the protection and sustainable use of these resources are either out of date or non-existent.

Yugoslavia is a party to several agreements on the protection of the marine environment, such as the International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, the International Convention for the Prevention of Pollution from Ships, the International Convention for the Prevention of Pollution of the Sea by Oil, and the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter.

The Socialist Federal Republic of Yugoslavia ratified the 1976 Barcelona Convention for the Protection of the Mediterranean Sea against Pollution. In addition, it ratified the Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft, the Protocol concerning Cooperation in Combating Pollution of the Mediterranean Sea by Oil and Other Harmful Substances in Cases of Emergency, and the Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-based Sources in 1980.

Other environmental UNECE conventions

Yugoslavia is planning to ratify the UNECE Convention on Environmental Impact Assessment in a Transboundary Context in the near future. Currently, the environmental impact assessment procedure is regulated and implemented by the republics. The Federal Secretariat for Labour, Health and Social Care is in charge of the exchange of information in a transboundary context.

Yugoslavia has not ratified the UNECE Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, but it has begun a number of activities toward this end. For example, Yugoslavia is participating in the regional REReP project "Development of a Strategy for Implementation of the Aarhus Convention". The ratification of the Convention is currently under consideration. The Convention is considered highly relevant, in particular in the ongoing process of State and constitutional reform.

There are ongoing preparations for ratification of the UNECE Convention on the Transboundary Effects of Industrial Accidents. Recent experiences with transboundary accidental pollution in the region (e.g. Tisza) demonstrate the relevance of this MEA.

4.4 Cooperation through bilateral and multilateral agreements

Yugoslavia entered into a framework agreement with the European Union on assistance in November 2000. Today, the European Agency for Reconstruction (EAR) is responsible for the management of the main EU assistance programmes in Yugoslavia. These are part of the European Union's ongoing process of deepening political and economic dialogue with Yugoslavia. They fit within the EU Country Strategy Paper for Yugoslavia for the period 2002-2006.

EAR opened an office in Belgrade in December 2000. For the year 2002, EAR will assist Serbian environmental activities for the first time. An amount of €500,000 has been pledged to help with drafting new environmental laws in line with EU legislation, the establishment of the new Serbian Ministry for Protection of Natural Resources and

Environment, and the involvement of civil society in environmental protection.

EAR opened an office in Podgorica in Montenegro in February 2001. EAR-funded activities in 2002 include sewerage and waste-water treatment (€1.7 million) in the coastal region as well as in the Virpazar area close to Skadarsko Jezero.

EAR has also opened a separate office in Kosovo and Metohija, where it has been active since February 2000. In the 2002 EC Annual Programme for Kosovo, EAR manages €134.4 million, of which €5 million are dedicated to water and the environment. An additional €38 million has been dedicated to a three-year project to rehabilitate the urban water supply and sanitation systems.

As with multilateral cooperation, Yugoslavia's bilateral cooperation has suffered over the past decade. Currently, Yugoslavia is Party to Agreements with Italy on the Protection of the Waters of the Adriatic Sea and Coastal Areas Against Pollution, ratified in 1977. Treaties have been concluded between Yugoslavia and the Russian Federation on cooperation on environmental protection, as well as on the prevention and remediation of industrial and natural hazards.

In July 2002, an agreement on environmental protection was signed with the Government of Finland, providing for bilateral assistance in harmonizing environmental legislation with that of the EU.

The first environmental projects implemented in Yugoslavia in 1999 were a part of the FOCUS initiative established by Austria, Greece, the Russian Federation and Switzerland. Because the FOCUS ecological projects were able to address only some of the immediate remediation needs, additional financing was provided by the Swiss Disaster Relief Unit of the Swiss Agency for Development and Cooperation. Projects funded include: a waste-water canal floating barrier in Pancevo, mercury decontamination in HIP Petrohemija Pancevo, soil decontamination in Beopetrol fuel storage in Bogutovac, the decontamination of HIP Azotara fuel storage in Pancevo, groundwater monitoring in Novi Sad, in Pancevo, in Nis and in Smederevo.

4.5 Cooperation with international organizations

The main international actors involved in environmental cooperation in Yugoslavia are United Nations system organizations, and, in particular, UNECE, UNEP and UNDP, the World Bank, other international financing institutions, such as the European Bank for Reconstruction and Development and the European Investment Bank, and the Organization for Security and Cooperation in Europe (OSCE). The main agency for the implementation of EU programmes and EU support to the stabilization and association process is EAR (see section on bilateral and multilateral agreements, above). The Regional Environmental Center (REC), through its headquarters and its country, field and project offices, plays a significant role and acts as the secretariat for the Regional Environmental Reconstruction Programme (REReP).

Among other activities in Yugoslavia, UNECE undertook this Environmental Performance Review at the request of the (then) Federal Ministry of Health and Social Policy (currently the Federal Secretariat of Labour, Health and Social Care), and UNECE and UNEP together organized an international seminar on the implementation of multilateral environmental agreements in Yugoslavia. UNECE also cooperates actively with Yugoslavia through its regional environmental conventions (see above).

Immediately following the Kosovo conflict, UNEP, together with the United Nations Centre for Human Settlements (Habitat), established a Balkan Task Force. On the basis of the Task Force's findings, UNEP identified several environmental hot spots, requiring short-term remediation, and began implementation of clean-up projects, in particular in Novi Sad, Pancevo, Kragujevac and Bor. In January 2001, a project implementation office was opened in Belgrade. Urgent clean-up needs are not yet met but additional resources must be made available. Special areas of concern remain Pancevo and Bor. In 2002, UNEP published a report on the effects of the use of depleted uranium ammunition in Serbia and in Montenegro. Parallel to the urgent clean-up activities, UNEP has been active in several capacity-building activities, including a number of workshops. Discussions on the

establishment of a cleaner production centre in Serbia continue with national and international institutions.

The current work of UNDP is governed by its "First Country Cooperation Framework for the Federal Republic of Yugoslavia 2002 – 2004." In accordance with the Framework, UNDP is focusing its activities on energy efficiency, including the installation of monitoring equipment, consensus building, fund raising and the promotion of sector reform through advisory services and capacity building. Furthermore, UNDP will work on transboundary issues. In Montenegro, UNDP is implementing an Eco-Development Initiative (EDI) to link ministries, municipalities and civil society, and to integrate environmental and energy sustainability objectives in macroeconomic and sector policies. EDI also includes campaigns for public awareness and participation in decision-making. UNDP established a separate office in Pristina and drew up an environmental action plan, as the basis for a number of environmental protection projects.

Yugoslavia joined the Global Environment Facility in September 2001 and became eligible to apply for GEF grants. GEF offers important opportunities for international cooperation in its focal areas, including biodiversity, climate change and ozone depletion. Furthermore, GEF is the financial mechanism for the Stockholm Convention on Persistent Organic Pollutants and for the Cartagena Protocol on Biosafety. When Yugoslavia ratified the Convention on Biological Diversity (see above), it became eligible for GEF enabling activities on biodiversity, to assist it in developing a national biodiversity strategy and action plan. Furthermore, it may apply for the "Development of a National Biosafety Framework" in accordance with the Cartagena Protocol on Biosafety, implemented by the UNEP Biosafety Unit. Yugoslavia also became eligible for GEF funding when it signed the Stockholm Convention on Persistent Organic Pollutants. Yugoslavia has already initiated the implementation of the enabling activities project under the United Nations Framework Convention on Climate Change.

On 8 May 2001, Yugoslavia succeeded to membership of the World Bank. Among the five priorities of the World Bank's special trust fund (established in March 2001) are assistance to power rehabilitation in Serbia and the rehabilitation of coastal environmental infrastructure in Montenegro. Currently, the World Bank is carrying out a comprehensive environment sector review for Yugoslavia that will define priorities for future World Bank assistance. One important aspect is the integration of environmental liability concerns into the privatization process, such as the development of clear and transparent rules for assigning liability for past environmental damage. Amongst its current activities, the World Bank has initiated assistance for the preparation of a national environmental action plan (NEAP) for Yugoslavia, and it has recommended a transboundary GEF project together with Albania on Skadarsko Jezero (ecosystem conservation through sustainable tourism, fisheries).

As mentioned above, the Regional Environmental Center for Central and Eastern Europe (REC) acts as the secretariat for the Regional Environmental Reconstruction Programme (REReP) in the framework of the Stability Pact for South Eastern Europe. REC also co-implements the following regional projects in Yugoslavia under the REReP: support to strengthen the capacities of the national environmental protection agencies and their inspectorates to, inter alia, implement multilateral environmental agreements and prepare projects, develop national information systems, network environmental and finance specialists, and develop strategies for the implementation of the Aarhus Convention, environmental legal advocacy and advisory centres.

REC opened country offices in Belgrade and in Podgorica in 1998. It signed a memorandum of understanding with the Federal Ministry of Foreign Affairs, as well as an agreement on technical cooperation with Serbia in 2001. The office in Podgorica is responsible for implementing the REReP project, "The Promotion of networking and exchange of experience in countries of South-Eastern Europe". As a pilot activity, the project office is coordinating implementation of a transboundary wetland project on Skadarsko Jezero involving Montenegro and Albania. REC also established a field office in Pristina in 2000 to provide services to local (Albanian and Serbian) NGOs.

OSCE supported the development of Serbia's draft law on the environmental protection system, and the proposal for the structure of the new Serbian Ministry in the framework of a project involving expert advice from a broad range of international and European Union experts and institutions. The process of law drafting was accompanied by a media and public awareness campaign supported by

OSCE, aiming at ensuring nation-wide public participation in the drafting process, and involving local authorities, national and international NGOs, and other stakeholders.

4.6 Conclusions and Recommendations

Whereas during the period of international isolation, environmental cooperation was considerably restricted, some important multilateral environmental agreements have been ratified in the past year. In this respect, the track record of Yugoslavia's environmental cooperation since the normalization of its international relations has been truly impressive.

Considerable improvements have been effected in institutional and legal strengthening with the support of the international community, such as the establishment of environmental ministries in Serbia and in the province of Kosovo and Metohija, and the preparation of comprehensive draft laws for environmental protection. The process of further legal harmonization, e.g. with relevant European Union legislation, is continuing with support from the international community.

However, in the current situation there are also scattered or unclear competences among State institutions, and this affects international environmental cooperation. Whereas Yugoslavia is responsible for international law, is the international legal subject (person) and as such is competent for ratifying international environmental agreements, it shares competencies for implementation with its constituent republics. This leads to a situation where various State institutions can be involved in the same or similar issues, sometimes causing duplication and lack of clarity for the international community. Taking into account constraints in communication between some republican institutions and some federal institutions, the situation can raise significant obstacles to efficient decision-making and administration. Furthermore, access to international cooperation and assistance for Montenegro is in certain instances particularly difficult.

Various channels for international environmental cooperation were established before and after the normalization of international relations, some of which have proven to be effective. The ability of the two constituent republics and the Federal Government to develop practical, workable solutions in environmental protection could provide best-practice examples for other areas, and thereby contribute to the overall stabilization and association process with the European Union.

Recommendation 4.1:
*The **Federal Government of Yugoslavia** should establish a standing consultative mechanism with **Serbia** and **Montenegro** to:*

- *Clarify the respective roles of the Federal Government and the two republics with regard to international cooperation in environmental (and other) areas;*
- *Coordinate the implementation of international conventions;*
- *Facilitate decision-making on related issues; and*
- *Discuss the modalities for entering into bilateral agreements specific to one republic (e.g. concerning the coastal area or the Danube River basin).*

Due to Yugoslavia's geographical, hydrological and ecological situation, the water sector should be a domestic priority. This is true also for the management and protection of transboundary and international waters, which are major challenges. Currently, bilateral or regional agreements with neighbouring States on water protection and management are either out of date or non-existent.

Recommendation 4.2:
*The **Federal Government of Yugoslavia** should ratify:*

- *The Sofia Convention on Cooperation for the Protection and Sustainable Use of the Danube River;*
- *The UNECE Helsinki Convention on the Protection and Use of Transboundary Watercourses and International Lakes;*
- *The UNECE Helsinki Convention on the Transboundary Effects of Industrial Accidents;*
- *The UNECE Espoo Convention on Environmental Impact Assessment in a Transboundary Context; and*
- *The 1995 Revised Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean.*

*Following ratification, the Government of **Serbia** and the Government of **Montenegro** should implement these conventions.*

*Yugoslavia in cooperation with the Governments of **Serbia** and **Montenegro** should also make operational as soon as possible bilateral agreements dealing with transboundary water issues.*

In the context of State reform, due consideration should be give to the strengthening of the role of civil society in the preparation and implementation of environmental policies.

Recommendation 4.3:
*The **Federal Government of Yugoslavia** should ratify the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters as soon as possible.*

*Following ratification, the Government of **Serbia** and the Government of **Montenegro** should implement the Aarhus Convention.*

The management of hazardous chemicals, the management of stockpiles of hazardous wastes, and improvements in pollution prevention and control in industry and agriculture are among Yugoslavia's national priorities. Moreover, the needs for clean-up of the hot spots identified by the UNEP Balkans Task Force have not yet all been met. Additional resources should be made available to reduce the health and environmental risks at the hot spots, especially in Pancevo and Bor.

One priority convention for further implementation is the Basel Convention. In accordance with international trends, it is also important to develop an integrated approach to chemicals management, as reflected in the Stockholm Convention on Persistent Organic Pollutants and the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade.

Recommendation 4.4:
*The **Federal Government of Yugoslavia** and the respective ministries of **Serbia** and **Montenegro** should seek further international support for establishing cleaner production centres. Support for the implementation of conventions related to the management of chemicals should be provided or channelled through such centres, in cooperation with the Basel Convention's Regional Centre for Training and Technology Transfer in Bratislava (Slovakia), United Nations Environment Programme (UNEP) and the United Nations Industrial Development Organization (UNIDO). (see also recommendations 7.2b and 10.3.)*

Yugoslavia ratified the Convention on Biological Diversity (entry into force: 1 March 2002), which is a requirement for application to the Global Environment Facility. With the signing of the Stockholm Convention on Persistent Organic Pollutants, Yugoslavia became eligible for GEF funding. Taking into account Yugoslavia's relatively recent membership in GEF, it seems logical to start with capacity-building projects such as the so-called enabling activities in several focal areas.

Recommendation 4.5:
*The **Federal Government of Yugoslavia** should consider submitting the following projects (among others) to the Global Environment Facility for funding:*

(a) Enabling Activity for Biodiversity, to develop a national biodiversity strategy and action plan. After implementation of the Enabling Activities, a second project for the establishment of a clearing-house mechanism could be envisaged; (see also recommendation 9.3.)

(b) Development of a national biosafety framework. Yugoslavia would need to express its intention to ratify the Cartagena Protocol on Biosafety; and

(c) Development of a national implementation plan for the Stockholm Convention, using the Global Environment Facility's "Initial guidelines for enabling activities for the POPs Convention."

In the current context of the Stability Pact, regional cooperation among South East European countries remains a high priority. Furthermore, many of the environmental issues in the region are transboundary, but cooperation with neighbouring countries is still relatively poor, and only a few bilateral agreements on environmental issues have been developed.

Recommendation 4.6:
*(a) The **Federal Government of Yugoslavia** should continue to give high priority to regional and transboundary cooperation, in particular within the framework of the Regional Environmental Reconstruction Programme (REReP). Further development of bilateral environmental framework agreements with neighbouring or other States is encouraged.*

Serbia and Montenegro should be enabled to establish transboundary cooperation arrangements where they have specific interests.

(b) ***Serbia**'s Ministry for Protection of Natural Resources and Environment and **Montenegro**'s Ministry of Environmental Protection and Physical Planning should consider developing programmes for assistance in the implementation of multilateral environmental agreements in a regional context, in the framework of and fully harmonized with the AIMS project (Support to Acceptance and Implementation of Multilateral Environmental Agreements in South-Eastern Europe, REReP 1.12).*

PART II: MANAGEMENT OF POLLUTION AND OF NATURAL RESOURCES

Chapter 5

MANAGEMENT OF WATER RESOURCES

5.1 Yugoslavia

Water resources

Yugoslavia has an annual water flow of about 1,500 m^3 per capita, which classifies it among the water-poor areas of Europe. Water supply flow is seasonally uneven. The annual average precipitation in Yugoslavia is 734 mm, but there are wide variations. In Serbia annual precipitation varies from 550–650 mm in Vojvodina to 800–1200 mm in the mountainous regions. All the lower areas of Serbia, including the lower Drina basin, have a precipitation of below 800 mm/year. Montenegro has an abundant precipitation of about 2000 mm/year, on average, and locally up to 5500 mm/year, with a maximum of 8500 mm/year. Internally renewable water resources are limited, since about 84% of the available water resources originate outside Yugoslavia. The yearly groundwater reserves total about 244 m^3 per capita.

The majority of rivers in Yugoslavia belong to the Danube River basin (Table 5.1). Some rivers in Montenegro flow into Skadarsko Jezero and the Adriatic Sea. Generally, the mountainous southwest, the east and the south of Serbia have greater water potential than the north and the centre. There are 60 large reservoirs (about 20 of them larger than 10 million m^3) and about 100 smaller reservoirs in the Danube River basin in Yugoslavia. The total retention volume of all reservoirs is about 6.5 billion m^3.

Floods

Floods have always endangered large parts of Serbia, particularly the valleys of larger watercourses in which the biggest settlements, the best farmland, infrastructure and industry are located. Floods are caused by various climatic, meteorological and other natural and anthropogenic factors (precipitation, coincidence of heavy rainfall and high river flows, snow melt, ice-related phenomena, damage to protective structures and changes in run-off conditions). So extensive systems for flood mitigation and for the regulation of watercourses have been built. There are about

Table 5.1: Major rivers and canals

River	Length in Yugoslavia			
	Total length (km)	(km)	Navigable length (km)	Flows into
Danube	2,783	588	588	Black Sea
Tisza	966	168	168	Danube
Sava	945	206	206	Danube
Tamis	359	118	3	Danube
Drina	346	220	..	Sava
Zapadna Morava	308	308	..	Velika Morava
Juzna Morava	295	295	..	Velika Morava
Ibar	272	272	..	Zapadna Morava
Begej	244	75	75	Tisza
Nisava	218	151	..	Juzna Morava
Timok	202	202	..	Danube
Velika Morava	185	185	3	Danube
Lim	220	160	..	Drina
Tara	141	141	..	Drina
Moraca	99	99	..	Skadarsko Jezero
Canals	939	939	673	

Source: Djordjevic, S. Jovanovic, M. and Petrovic, J. Faculty of Civil Engineering. Flood Risks in the Federal Republic of Yugoslavia. Belgrade, Yugoslavia.

3,550 km of flood-defence embankments in Yugoslavia. However, both direct and indirect damage due to floods and non-regulated rivers is still important.

In Montenegro, plains comprise only 5% of its 3812 km^2, of which only one third is periodically flooded. In comparison to the overall flood potential of Yugoslavia, this is minor. However, locally it is of major importance for Montenegro, because of the general scarcity of farmland, which is entirely confined to the flood plains. In addition to the farmland, numerous villages, traffic and communication lines are endangered by flooding, while in the region of Skadarsko Jezero, flooding has detrimental effects on hygiene for the local population, In some regions, the surface run-off reaches 60–80 litres/sec per km^2, or 44 litres/sec per km^2 on average (which is 6.4 times greater than the world average). However, the uneven distribution of rainfall over the year causes seasonal flooding, which is most intensive from November to December and somewhat less intensive from February to May. Yugoslavia flood issues and management measures are the subject of a study financed by the World Bank.

Water supply

The water supply and sanitation sector was well developed in the former Yugoslavia and, even today, coverage in urban areas reflects this legacy. In 2000, 98.4% of the country's population had access to safe drinking water using the commonly accepted definition of "access to improved water sources," i.e. sourced from a pipe, a public tap, borehole/tube well, protected well, protected spring or rainwater. Given the country's level of development, a more useful figure is the percentage of the population that received piped water supply to the home or garden. This figure is 86.6% in Yugoslavia. Regional differences are significant and indicate that outside of the large cities, water supply coverage is low, e.g. in Serbia, 92.9% of the population in the Belgrade area has water piped into the dwelling or garden, while the proportion for the rest of central Serbia is only 77.0%.

These coverage figures may offer too positive a picture. Households appear to have reported what they have, not what is properly functioning. Officials report that many of the piped water-supply systems are operating poorly, if at all, particularly in rural areas. The coverage figures also do not reflect service interruptions, which are significant (table 5.3). Here, too, there are notable regional differences, with Vojvodina experiencing the most and longest interruptions in service.

Water quality

The republican institutes of hydrometeorology routinely monitor surface inland water and groundwater quality. This activity is supported by government budget grants so that budgetary limitations have a large impact on it. There are about 160 gauging stations on rivers within the Danube River basin where both flow and water quality are measured regularly. Water quality of the largest international rivers in the Danube watershed as well as water quality of the largest part of Yugoslavia's national rivers is far from satisfactory. This is particularly true for river stretches downstream of settlements because of untreated municipal and industrial discharges. Since the mid-1990s, water quality in many of the rivers has deteriorated from class II (suitable for bathing and drinking only after treatment) to class III quality (suitable for irrigation and industry only). In Serbia, 50% of drinking-water samples do not meet the required standards and in most Montenegrin cities that figure stands at around 15-20%. Unchecked industrial pollution, untreated waste-water discharges and transboundary inputs are amongst the causes of surface and groundwater pollution.

Ten years of little maintenance and no investment in the water and waste-water supply sectors have resulted in a situation where most water-supply networks have difficulty in ensuring a regular supply of safe water and most municipal and industrial waste waters are discharged largely untreated. The Yugoslav municipalities reporting the best water quality are the large cities (Belgrade, Novi Sad, Nis and Podgorica), where there are more financial resources to adequately operate and maintain the water-supply systems. The municipalities recording the poorest water quality often correspond to those housing refugees and internationally displaced persons, though it is not known whether this is due to prior problems with water infrastructure or to increased demands on the system. Medium-size towns and rural areas have the most difficulty in providing safe and adequate supplies of drinking water.

Table 5.2: Percentage of the population with a water supply of different service levels

percentage

Territory	Piped into dwelling	Piped into garden or plot	Public tap	Tube well/ Borehole with pump	Protected dug well	Unprotected dug well	Other	Missing	Total
Yugoslavia excl. Kosovo and Metohija	83.8	2.8	0.6	4.4	6.8	0.7	0.5	0.3	100
Montenegro	85.1	6.0	1.0	1.1	3.0	0.4	2.2	1.2	100
Serbia excl. Kosovo and Metohija	83.7	2.6	0.6	4.6	7.0	0.8	0.4	0.3	100
Central Serbia	81.3	2.6	0.6	4.4	9.6	1.0	0.3	0.2	100
Central Serbia excl. Belgrade	77.0	3.2	0.8	4.8	12.4	1.3	0.4	0.2	100
Belgrade	92.9	1.2	0.0	3.5	1.9	0.3	0.1	0.0	100
Vojvodina	90.4	2.5	0.7	5.2	0.1	0.0	0.7	0.5	100
Area									
Urban	97.0	1.0	0.1	0.4	0.4	0.0	0.3	0.3	100
Rural	68.0	4.8	1.3	9.1	14.1	1.6	0.8	0.3	100

Source: United Nations Children's Fund (UNICEF). Multiple Indicator Cluster Survey II 2000.

Table 5.3: Percentage of the population with interruptions of water supply

Territory	None	Yes, sporadic	Yes, daily	Yes, during the summer	Number
Yugoslavia excl. Kosovo and Metohija	51.7	28.4	5.0	15.0	5,730
Montenegro	41.5	29.9	7.1	21.4	350
Serbia excl. Kosovo and Metohija	52.3	28.3	4.9	14.6	5,380
Central Serbia	57.4	23.5	5.8	13.4	3,849
Vojvodina Area	39.6	40.3	2.6	17.6	1,531

Source: UNICEF. Multiple Indicator Cluster Survey II 2000.

Some of the decline is attributed to the higher level of pollution in those water sources entering Yugoslavia**.** Water resources in Yugoslavia are fed by countries upstream, with water quality ranging from class III (e.g. Tisza River, Sava River) to the more common class IV (e.g. the Begej River). These water resources tend to be contaminated with nutrients, oil, heavy metals and organic components. Examples of very clean water - classes I and I/II - are rare, and are situated in mountainous regions, e.g. along the Tara River and the Piva River in the north of Montenegro, and the Rzav, Studenica, Moravica (up to Soko Banja), Mlava (up to Petrovac) and Crni Timok in the western part of central Serbia.

Although the quality of the coastal marine waters off Montenegro is generally satisfactory, the threat of coastal zone deterioration in Montenegro is crucial due to uncontrolled construction, the lack of waste-water treatment and the lack of a coastal zone management strategy (see also chapter 14, on tourism and the environment).

Sanitation and waste-water treatment

Most of the country's population (99.6%) lives in households with sanitation services of some kind; 88.3% of the population is serviced by a sewerage system or septic tanks. In 1991, 66% of the population lived in a dwelling with either a sewerage system or septic tank. By 1996 the figure was 77% and, in 2000, 88%, indicating improvements in sanitation coverage. As one sign of the positive impact of these improvements, mortality among infants and children under five declined by one half during the 1990s and is associated with improved household sanitation and improved treatment for diarrhoea and acute respiratory disease. Yet serious problems still remain in the sector, particularly in the rural areas. The urban/rural coverage with a sewerage system is

87.5 and 22.2%, respectively. Rural areas rely primarily on septic tanks for sanitation. Many septic tanks are improperly designed and situated.

Roma communities throughout Yugoslavia appear to have particularly inadequate water supply and sanitation. Within Roma settlements, access to utility and public services is non-existent or limited, and the most serious problems are the lack of access to electricity, water, sewerage and rubbish collection. These conditions place the population at increased risk from water-related disease.

Point sources of pollution in the Danube River basin in Yugoslavia include the over 7,000 settlements and communities. There are very few large cities (>100,000) in the Yugoslav Danube River basin. Almost 90% of settlements have populations of fewer than 2,000. The principal municipal point source polluters are the settlements with over 10,000 inhabitants, making up only 2.2% of the total number of settlements but causing more than 90% of the total pollution load. Most of the small and medium industries are located in these settlements.

Policy objectives and management

The legal framework

In Yugoslavia the legislation on measurements and water quality is fairly developed. There are a large number of by-laws. The monitoring of the quality of water directly related to public health, i.e. drinking water and water for recreation, is under the jurisdiction of the federal and the republics' health ministries. Measurements, processing, publishing and distributing data on drinking water are the responsibility of the republics' institutes for health. The data on drinking water quality are published in local and regional bulletins, whereas the constituent republics' Ministries submit separate annual reports to their governments. The Federal Secretariat for Labour, Health and Social Care submits an annual report on drinking-water quality to the World Health Organization (WHO). The criteria and standards for drinking water are fully coordinated with EU and WHO standards and guidelines. The monitoring of ambient water quality is the responsibility of the republics' hydrometeorology institutes. The criteria and standards for surface water are defined by the regulations of the republics. The Federal Hydrometeorological Institute is responsible for international water issues. The results of all testing are published annually.

Irrigation water is the responsibility of the republics' agriculture ministries.

Box 5.1 contains the most important federal legislation on water.

Yugoslavia signed the Convention on Cooperation for the Protection and Sustainable Use of the Danube River (Danube Convention) (1994), and ratification is pending in the Federal Assembly. Yugoslavia has cooperated fully with the International Commission for the Protection of the Danube River. It participated in the development of the GEF-funded Danube Transboundary Diagnostic Analysis, by preparing a national review and holding a national planning workshop in November 1998. When the country ratifies the Danube Convention, it will become eligible for GEF grants for investment projects under the GEF Strategic Partnership Investment Fund for Nutrient Reduction in the Black Sea/Danube Basin (see also chapter 4, on international cooperation.)

Box 5.1: Legal framework for water management

- The Law on coastal sea and epi-continental belt (No. 49/87, 57/89, 24/94, 28/96);
- The Law on Hydrometeorological Affairs of Interest to the Country (No. 18/88, 63/90);
- The Law on sea and internal shipping (No. 12/98, 44/99, 74/99, 73/00);
- The Law on the Water Regime (No. 59/98);
- Regulations on classification of inter-republic water flows, interstate waters and coastal sea waters of Yugoslavia (No. 6/78);
- Regulations on establishing networks of hydrological stations of interest to the country (No. 50/90, 54/90);
- Regulations on the sanitary quality of drinking water (No. 42/98, 44/99); and
- The Decision on maximum permitted concentrations of radionuclides and hazardous substances in inter-republic water flows, interstate waters and coastal sea waters (No. 8/87).

Table 5.4: Percent coverage to sanitation options

percentage

Territory	Flush to sewage system	Flush to septic tank	Improved pit latrine	Traditional pit latrine	No facilities	Missing	Total
Yugoslavia excl. Kosovo and Metohija	57.2	31.1	0.7	10.5	0.1	0.3	100
Montenegro	60.6	28.2	0.6	8.4	0.7	1.5	100
Serbia excl. Kosovo and Metohija	57.0	31.3	0.7	10.7	0.1	0.3	100
Central Serbia	61.7	25.6	0.8	11.6	0.1	0.2	100
Central Serbia excl. Belgrade	53.3	30.4	1.0	14.9	0.1	0.2	100
Belgrade	84.5	12.4	0.2	2.8	0.0	0.0	100
Vojvodina	44.1	47.2	0.3	7.9	0.0	0.5	100
Area							
Urban	87.5	10.1	0.1	1.9	0.0	0.4	100
Rural	22.2	55.5	1.3	20.4	0.2	0.3	100

Source: UNICEF. Multiple Indicator Cluster Survey II 2000.

The institutional framework

Accentuated by the de jure and de facto shift of competencies from the federal level to the republics, the responsibilities of the Environment Department (within the Federal Secretariat for Labour, Health and Social Care) have diminished. The Department continues to play an important role in international matters, such as the negotiation and ratification of international environmental conventions and agreements, as well as obligations stemming from them, such as the monitoring of transboundary water pollution, which is within the competence of the Federal Hydrometeorological Institute.

The Institutes of Public Health in Serbia and Montenegro are responsible for monitoring drinking-water supplies and have the authority to close systems that do not produce water according to standards. In Serbia, officials report they have closed many systems, usually in small towns (5,000 to 10,000 inhabitants). The most common operational problem that leads to closure is the lack of a functioning disinfection system (chlorination). Either the equipment is broken or the chlorine is not available. NATO bombings in 1999 destroyed the two chlorine manufacturing plants and since then supplies have been erratic.

Water management

Urban water and sanitation services are decentralized and delegated to the municipality. A typical utility provides water-supply and waste-water services and, sometimes, solid waste management. Although many are legally independent entities on paper, these enterprises generally have little autonomy and no control over crucial aspects of their business. Investment decisions have until now usually been taken by the municipality or the republics, with a strong bias towards new infrastructure, disregarding the need to improve maintenance and rehabilitate existing assets. Operationally, the sector suffers from huge physical losses, in the region of 50% and more, a lack of demand management, inadequate pricing policies, fragmented institutional arrangements, and a misuse of water supply for non-household activities. By international standards the utilities are overstaffed, inefficient, and lacking modern management and control systems and governance.

There is no federal or republican agency that regulates water utilities, plans service needs or channels funds or support in a coordinated manner. Several ministries (agriculture, forestry and water management, civil engineering, health, and finance) control utility operations in the areas under their authority, all of them involved (including ministries that have no logical involvement with the sector, such as the Justice Ministry), but none with real sector responsibility or leadership functions. This, combined with the "de facto" complete decentralization of service provision to municipalities, results in fragmentation, and a lack of planning and advocacy for the sector. The multitude of uncoordinated laws and regulations applicable to the sector further contribute to its fragmentation. A long period without proper maintenance and almost no investment has resulted in significant operational problems. Most water-supply systems are in a critical condition and require urgent rehabilitation.

Transboundary water

The Danube River

Most of Yugoslavia is located within the Danube River basin (89,000 km^2, or 87% of the total territory and about 11% of the Danube River basin area). Most of this area, 81,660 km^2, lies in Serbia. Inhabitants of the Danube River basin area within Yugoslavia are estimated at 9 million, which is 11% of the total Danube River basin population. The section of the Danube that flows through Serbia is 588 km long; about 138 km constitute the State border with Croatia and about 213 km the State border with Romania. The Danube's largest tributaries, the Drava, the Sava and the Tisza, empty into the Danube in Serbia, increasing its flow about 2.5-fold. Other significant tributaries that empty into the Danube in Yugoslavia include the Velika Morova and the Tamis, which come from Romania, and the Timok, which constitutes part of the Yugoslav-Bulgarian State border.

Over 95% of the water that enters Yugoslavia from neighbouring countries does not meet Yugoslavia's ambient water-quality standards. It is estimated that each year about 580,000-620,000 tons of BOD, about 380,000-450,000 tons of nitrogen in various forms, and about 20,000-25,000 tons of phosphorus enter Yugoslavia. The country then contributes more to the Danube basin's nutrient load with annual amounts of 43,303 tons of nitrogen and 14,128 tons of phosphorus. Thus, although the Danube water coming into the country is polluted by other upstream countries, Yugoslavia is considered one of the biggest polluters, contributing about 13% of the Danube's nutrient pollution. The Danube Pollution Reduction Programme has identified over 30 municipal "hot spots" of water pollution in the Danube basin (Figure 5.1). Distribution of municipal waste-water treatment plants is shown in figure 5.2.

Donor support in water supply and waste-water

In the past two years international financial institutions and both multilateral and bilateral donors have initiated projects in water supply and waste water, in large and medium-size cities and rural areas. These include several projects and activities presented in Box 5.2.

5.2 Serbia

Water resources

All rivers in Serbia belong to three sea basins: the Black Sea basin, the Adriatic Sea basin, and the Aegean Sea basin. The major tributary to the left of the Danube is the Tisza River, coming from Hungary. Its main tributaries are the Begej, the Tamis, the Karas and the Nera, all coming from Romania. The Danube, with a watershed of 817,000 km^2 and a mean flow rate of 6500 m^3/s at its mouth (Black Sea), is Europe's second largest river (after the Volga), and Yugoslavia's largest. Water flow is seasonally uneven, leading to quantity problems throughout Serbia. Water shortages are particularly serious in southern Serbia. Water shortages have required the construction of reservoirs, e.g. on the Drina, Danube and Lim Rivers in Serbia, as part of a regional water-supply strategy.

Water supply

In Serbia drinking water is supplied to 81.8% of homes or gardens. The figures for town and country are 98.0% and 63.3%, respectively (table 5.5). Regional differences can be wide particularly in rural areas, e.g. 70.9% of rural settlements in central Serbia receive piped water, as against 86.8% in Vojvodina.

About 50% of the Serbian population is supplied by public water-supply systems, of which there are 153 serving 168 municipalities. Most of these utilities have a municipal focus but there are several regional water-supply systems that serve more than one municipality. About half of the population receives water from the three largest water-supply systems (Belgrade, Novi Sad and Nis), with the remainder served by medium-sized public water-supply systems. Access to piped water and sewerage for ten representative small, medium and large municipalities is shown in table 5.6. While piped drinking water coverage is 80-100% in these ten communities; sewerage coverage lags behind in all municipalities, ranging from 45 to 80%. It is important to note that refugees account for as much as 50% of the population in some municipalities – a situation that has put a huge strain on the already deteriorated systems.

Approximately 50% of the population is considered "rural" in Serbia. There are three types of drinking-water supply sources for the rural population: (a) official piped water systems that are owned and operated by the municipality; (b) private piped systems built and operated by the communities themselves; and (c) private wells. Of these three types of service only the official piped water systems are monitored and regulated for drinking-water quality by the Institute of Public Health. Private drinking water supplies are not monitored by the Institute; however, on the basis of sporadic measurements, it estimates that about 90% of the private drinking-water supplies do not meet bacteriological standards for drinking water. This suggests that many rural communities and households may be vulnerable to water-related health problems. The size of the rural population at risk is difficult to determine since data on rural water-supply systems are very scarce, but some estimates indicate that about 50% of the rural population uses a drinking-water supply that is private, unmonitored and unregulated.

Water quality

Deterioration of the water-supply infrastructure, including the disinfection systems (chlorination), has contributed to a decline in the quality of piped drinking water. Contaminated water problems are prominent in Serbia, where, in 2001, 29% of samples from piped systems did not meet the physico-chemical or bacteriological standards. There are significant regional differences in water quality in Serbia, for instance between central Serbia and Vojvodina (table 5.7). Throughout Serbia, the main problems with physico-chemical water quality parameters are turbidity, iron, manganese, nitrates and, in Vojvodina, arsenic. In central Serbia the main problem is bacteriological contamination with more than 40% of samples not meeting standards. Vojvodina has severe problems with both physico-chemical and bacteriological standards; 67% of water samples do not meet standards. Schoolchildren appear to be particularly at risk, since 90 schools in Vojvodina have no water-supply facilities and in 508 schools drinking water was found to be bacteriologically unsatisfactory. Only in Belgrade is water quality generally adequate with more than 90% of water samples within standards.

Sanitation and waste-water treatment

The construction of municipal and industrial sewerage systems in Serbia during the past decades has lagged behind water-supply development, as can be seen from Table 5.6. There are distinct regional differences in sanitation coverage, with 44.9% of Vojvodina connected to the public sewerage network versus 66.9% for central Serbia (including Belgrade).

The quantities of municipal and industrial waste-water discharges have changed considerably in the past decade. Roughly 10% of the total waste water discharged in Serbia is from households, and this figure has remained steady throughout the 1990s. What has changed dramatically is the total amount of waste water from both households and industry. Both have dropped by about 60% since the early 1990s. Meanwhile waste-water treatment capacity has remained roughly the same for both domestic and industrial waste-water treatment, and the treated amount in 2000 remains similar to that of 1990.

Serbia has 37 central facilities for waste-water treatment, of which 7 have primary treatment and 30 have secondary or biological treatments. Seven of these facilities are over 30 years old and severely dilapidated and three are not working at all. Belgrade has no waste-water treatment plant and relies instead on the dilution and self-cleansing properties of the Danube. The municipalities of Arandjelovac, Bor, Becej, Vlasotince, Velika Plana, Vrsac, Gornji Milanovac, Dimitrograd, Aladovo, Kragujevac, Kikinda, Medvedja, Negotin, Paracin, Pozareva, Sombor, Surdulica, Soko Banja and Ruan have treatment plants. The efficiency of the municipal and industrial waste-water plants is minimal. It is estimated that only 13% of all treatment plants are satisfactory. Overall, only about 12% of municipal waste water is treated in Serbia.

The result of inadequately treated waste-water discharges is pollution of surface and groundwater. The impact of this on drinking-water supplies is described above. In terms of general water resources, surface water quality monitoring has found bacteriological pollution in small rivers and channels where municipalities and industries discharge their waste water. The most threatened waterways, where water quality is outside the classification system, are the Stari Begej Crnica, Lukavic, Veliki Lug, and Pristevka rivers. In the large rivers (the Danube, Sava, Tisza and Morava), increased bacteriological pollution is found downstream from the big cities, e.g. Novi Sad and Belgrade, but, due to the high velocity, the pollution is brought down relatively rapidly to

within the allowed limits. Non-point source pollution contributes more than 50% of total water pollution. These sources deliver 70% of total nitrogen, 50% of total phosphorus, and 90% of faecal and coliform bacteria.

Table 5.5: Serbia: Percentage of households with access to piped water

Territory	Total	Urban settlements	Rural settlements
Vojvodina	92.1	96.1	86.8
Central Serbia	88.3	99.2	70.9
Kosovo and Metohija	57.0	96.4	32.0
Total	81.8	98.0	63.3

Source: Serbia's Ministry of Health and Environmental Protection. Directorate for Environmental Protection. Report on the State of the Environment for 2000 with the Priority Tasks for 2001+ (Draft). November 2001.

Table 5.6: Selected municipal water supply and waste-water utilities

Municipal water and waste-water utility	Population served*	Water supply coverage, %	Sewerage coverage, %
Belgrade	1,650,000	80.0	65.0
Nis	317,000	90.0	70.0
Kragujevac	175,000	85.0	65.0
Kraljeva	115,000	90.0	80.0
Smederevo	110,000	98.0	65.0
Sremska Mitrovica	100,000	100 (city); 80 (muni)	80.0
Sombro	80,000	100.0	45.0
Sabac	75,000	65.0	50.0
Bujanovac	71,000	65.0	70.0
Pirot	55,000	95.0	80.0

Source: World Bank. Federal Republic of Yugoslavia. Breaking with the Past. The Path to Stability and Growth. Report No. 22267-YU. July 15, 2001.
Note: *Includes refugees

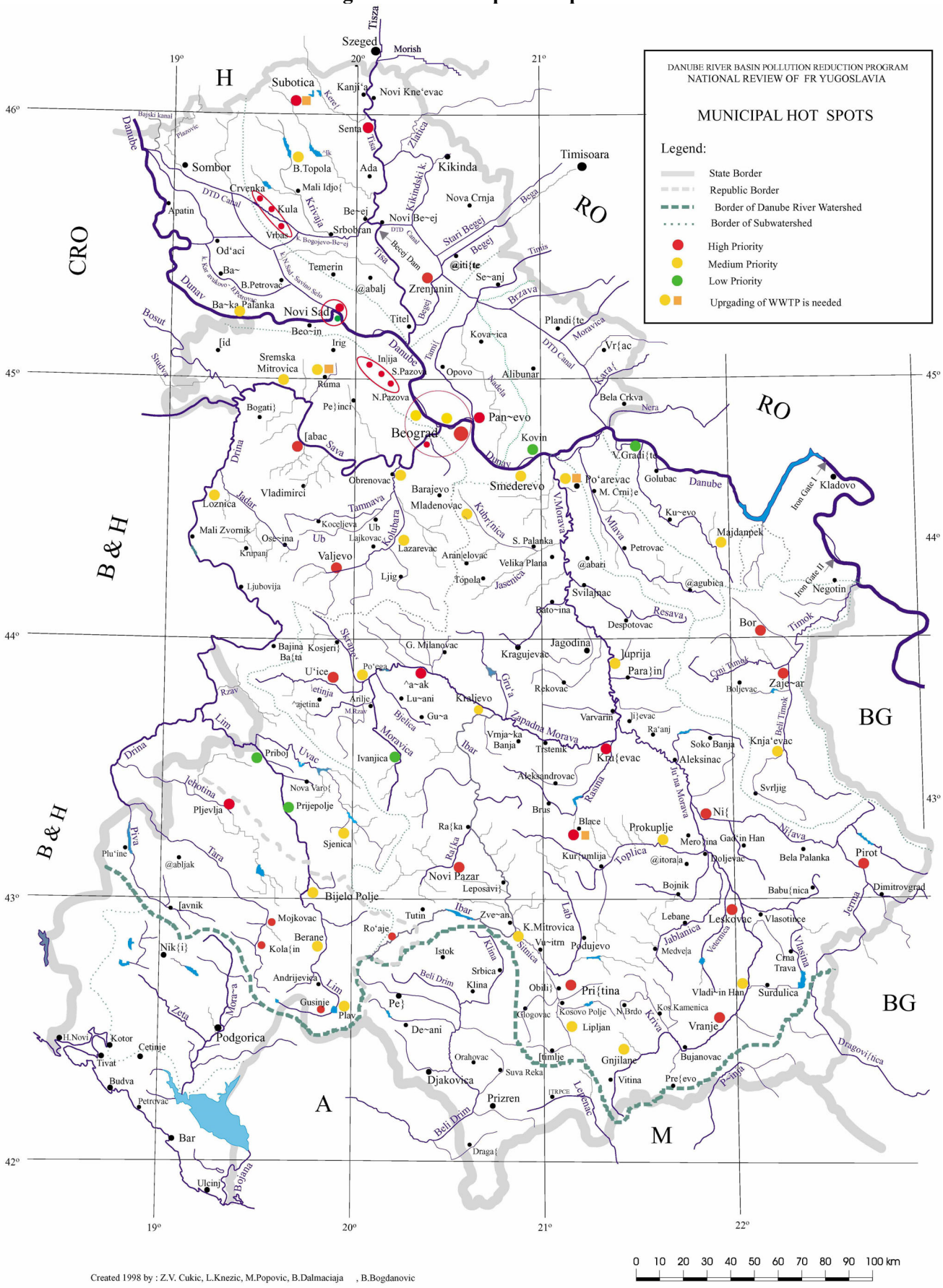
Table 5.7: Percentage of drinking water quality systems not meeting water quality standards in 2001

Region	>5% of samples do not meet bacteriological standards	>20% of samples do not meet physical & chemical standards	Do not meet either bacteriological or physico-chemical standards
Serbia - total	49	41	29
Central Serbia	41	31	17
Vojvodina	75	75	67

Source: Institute of Public Health.

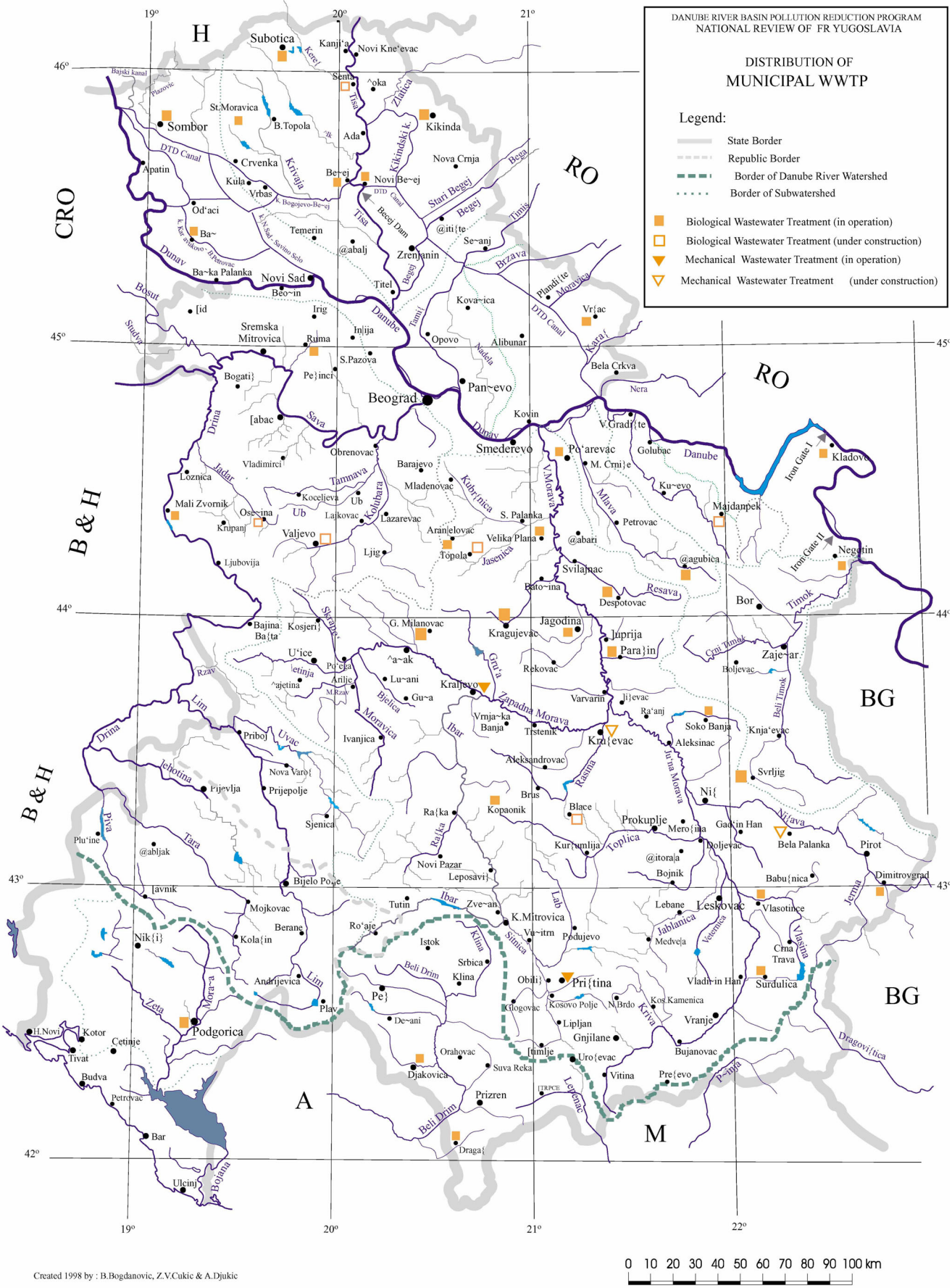
Note: Based on drinking water quality reports on 152 Serbian water supplies, of which 116 are in central Serbia and 36 in Vojvodina.

Figure 5.1: Municipal hot spots



Source: International Commission for the Protection of the Danube River, http://www.icpdr.org
Disclaimer: "The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations"

Figure 5.2: Distribution of municipal waste-water treatment plants



Source: International Commission for the Protection of the Danube River, http://www.icpdr.org
Disclaimer: "The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations"

Box 5.2: Donor cooperation in the water and waste-water sectors

Water supply, sewerage and waste-water treatment				
Republic	**Donor**	**Main activities**	**Funding**	**Comments**
Montenegro	EU through ERA	Funding of several feasibility studies on municipal infrastructure development and maintenance Capital investment in sewerage and waste-water treatment in the coastal region and in Virpazar (small locality on Skadarsko Jezero)	NA €1.7 million	EU intends to act as catalyst for investment in waste-water treatment and aim for cost-effective solutions. May provide co-financing to international financial institution and municipality funds
Serbia	European Bank for Reconstruction and Development (EBRD)	Loan to Nis to develop the city's sewage system between 2002 and 2004 Loans to the cities of Belgrade, Novi Sad and Nis to upgrade water-supply systems	€6 million NA	
Serbia	Germany	Rehabilitation of the Belgrade and Nis water-supply and waste-water treatment systems Revitalization of water-supply, municipal heating and waste-water systems, and development of small and medium enterprises in other cities	€5.1 million €37.3 million	
Serbia	France	Grant for the construction of drinking-water treatment plants and the local water-supply grid in the village of Ivanovo (2001) Grant to finance small, rural water-supply systems in Ruma, Vrnjakc, Banja and Lipovica (2002)	US$ 250,000 US$ 170,000	
Other municipal services				
Serbia and Montenegro	EU through ERA	Maintenance, repair and small-scale construction of infrastructure facilities (2001)	€320 million	Assistance expected to continue on the same scale and in the same areas, as stipulated in the EU Country Strategy Paper for Yugoslavia for the period 2002-2006
Serbia	USAID	Municipal infrastructure development and maintenance, and support to civil society development, NGO involvement in project implementation. Five-year programme	US$ 200 million	
Other				
Montenegro	Germany through KfW	Plans to invest in the environmental sector, specific areas to be determined.	€2.5 million	

Policy objectives and management

The policy framework

The Water Master Plan for Serbia, prepared by the Institute for the Development of Water Resources, was approved in 2002 and presents a strategy for water supply in Serbia for 2002-2012, including financing needs. To meet increasing demand, and to expand coverage, the Master Plan proposes the continuation of the development, begun in the 1980s, of regional water-supply systems for those regions where the capacities of local sources have been exceeded. Construction began on some of these systems, e.g. the Rzaz system, several years ago but was abandoned over the past few years. The completion of construction on all reservoirs where construction has begun (e.g. Stubo Rovni, Prvonek, Selovabut) is recommended in the Master Plan. It also proposes extensive work on the protection, reclamation and revitalization of groundwater resources, the induction of artificial recharge, and the use of advanced treatment technologies where needed. There are detailed proposals to upgrade the water-supply systems in Novi Sad, Vojvodina, Pancevo, Belgrade, Nis, and the regional systems in Bogoviana and Lopatnica. The Master Plan also proposes some solutions to Vojvodina's water-supply problems, e.g. reducing water extraction, improving water quality by treatment and supplementing water supplies from the regional water-supply systems. The total cost of the investment programme required to meet the objectives of the Master Plan, over five years (2002-2007), is €940 million, of which the State would finance 30%.

The Ministry of Agriculture and Water Management, which is responsible for the construction of water-supply systems in rural areas, has set its own priorities for rural water supply. Its priority areas for investment are southern Serbia – Vranje, Bujanovac and Presevo – Bor in eastern Serbia (for quantity issues) and Doljevac and Bojnik for quality problems. The Ministry has prepared a list of 70 drinking-water-supply projects (2002). Most investments are small, involve the rehabilitation or construction of new wells, pipeline extension and repair, and chlorination systems. According to the Ministry, most of these investments should be financed locally by the municipalities, but, in the absence of funds, the municipalities apply to Ministry.

A programme of water pollution control improvements for the period 2002 to 2012, with priority projects to be undertaken between 2002 and 2007, has also been prepared. The investments proposed are huge and estimated at €484 million over the next five years. The sector has prioritized investments focusing on the sewerage system and industrial pretreatment plants. New plants are selected according to environmental criteria, primarily the protection of water resources for drinking-water supplies, and have been identified as the Gruza reservoir, the Celije reservoir, the Ostruznica region sewerage system, Batajnica sewerage system, and treatment plants for Zrenjanin, Cajetina, Crvenka, Obrenovac, Nis, Vlasina Lake and Backa Palanka.

The legal framework

The Serbian Law on Waters (Nos. 46/91, 53/93, 67/93, 48/94, 55/96) is the legal basis for the protection of waters, the use and management of waters, goods of general interest, conditions and methods for performing waterworks-related activities, the organization and financing of such activities, and supervision and monitoring. The Law covers surface and groundwaters, including drinking water, thermal and mineral water and border and transboundary water flows and inter-republic water bodies within Serbia. By-laws cover a range of topics. Surface and groundwater monitoring are covered by the Law on Waters, the Regulations on hazardous substances in waters (Nos. 31/82 and 13/84). Regulations on the methods and the minimum number of waste–waster quality tests (No. 47/83) govern surface and groundwater quality monitoring. Water quality monitoring is conducted by the Republic Hydrometeorological Institute, which is obliged to measure and record quantities of discharged waste water and to submit the data to the relevant public enterprise. This includes monitoring the performance of waste-water treatment facilities (Box 5.2) (see also chapter 3, on information, public participation and awareness-raising).

The new draft law on the environmental protection system provides the legal basis for overcoming some of the institutional shortcomings that have so far hampered the effective implementation of environmental policy including water protection. It is expected that the new regulations governing the competencies of the Ministry for Protection of Natural Resources and Environment will lead to clearer demarcation and better cooperation and that the establishment of an environmental protection agency will, inter alia, lead to more systematic monitoring, better environmental information, and

stricter inspections and enforcement, including for water.

The drinking water quality standards used in Serbia and Montenegro are based on WHO drinking water quality guidelines and the EU directives for drinking water, whichever is more stringent. Drinking water quality monitoring control is the responsibility of the Institutes of Public Health, and is based on several regulations.

Waste water is regulated by: (i) Regulations on hazardous substances in waters; and (ii) Regulations on the methods and the minimum number of waste-water quality tests.

Rural water-supply systems operate in a legal and institutional vacuum, completely relying on the tradition of self-reliance and without any assurance that the rural population is receiving an adequate quantity of water or that it is not being exposed to severe health risks from poor-quality water. Rural sanitation and solid waste operate in even more of a void. The most vulnerable group is the poor, who can least cope with these problems.

The institutional framework

There is no federal or republican agency that regulates water utilities, plans service needs or channels support in a coordinated manner. Several ministries control different aspects of water supply, e.g. the Ministry of Agriculture and Water Management is responsible for some rural water-supply systems, for irrigation and for flood control. The Ministry of Justice and Local Government is responsible for waterworks. Urban water services are decentralized and delegated to the municipalities. Until 1990, municipalities were in charge only of the day-to-day operation of water utilities and the Serbian authorities were responsible for investment, identification, financing and implementation. Since 1990 these functions have also been largely transferred to the municipalities and direct investment stopped.

The water utilities are publicly owned, municipal companies that are managed by the local authorities. Each of them has a managing board, comprising representatives of the most important municipal stakeholders. A typical utility provides water-supply and waste-water services and, sometimes, solid waste management.

Water management

As indicated above, the sector suffers losses of 50% or more. Most areas have high per capita water consumption, well above the rates in comparable and more developed European neighbouring countries (consumption of 300 litres per person/day is not uncommon; the average in Western Europe is 180-200 litres). The water sector is not financially self-sustaining. Currently, the revenues of water utilities do not cover their operating costs. Utilities are running down their facilities and water and waste-water services are deteriorating.

Box 5.3: Legal framework for water management

- The Law on Waters (No. 46/91, 53/93, 67/93, 48/94, 54/96)
- Regulations on water classification (No. 5/68)
- Regulations on the categorization of watercourses (No. 5/68)
- Regulations on systematic water quality monitoring in 2000 (with the Programme) (No. 8/00)
- Regulations on the contents of technical documentation submitted in the process of applying for water resources compliance and water resources permits (No. 3/78)
- Regulations on the method of determining and maintaining sanitary protection zones for drinking water supply facilities (No. 33/78)
- Regulations on harmful substances in waters (No. 31/82)
- Regulations on the methods and the minimum number of waste-water quality tests (No. 47/83, 13/84)
- Regulations on conditions under which enterprises and other legal persons perform specific types of surface and groundwater quality investigations, including waste-water quality investigations (No. 49/90)
- Regulations on the conditions and methods for drinking water fluoridation (No. 6/97)
- Decree on deciding which enterprises and other legal persons fulfil the conditions for performing specific types of surface, groundwater and waste-water quality investigations (No. 16/91)
- Plan on water pollution protection (No. 6/91)
- Guidelines on methods and procedures for determining the level of treatment of waste water (No. 9/67)

The water utilities charge for communal water supply and sewage services provided by the public utility companies. The tariff system in Yugoslavia is based on the cost of producing and supplying water plus an administrative charge, i.e. the "cost-plus" (rather than a supply/demand) scheme with cross subsidies for the population by industry, which keeps profit at a minimum for the utility. The economic decline made cross subsidies impossible and resulted in a substantial reduction in water consumption by industry. The 20/80 revenue ratio (population vs. industry) in 1990 became 50/50 in the mid-1990s and fell even lower later. Meanwhile, poverty and industrial decline reduced the collection rate below 50% despite the prevailing low tariffs. Even though the tariffs were raised in October 2000, they are still below production costs. In addition, electricity charges are only 25% of the economic cost and are expected to rise soon. This will make it even more difficult for the water utilities to cover their operating and maintenance costs. In sum, municipal water and sanitation services are in deep financial and technical trouble, preventing utilities from initiating the rehabilitation work that is urgently needed to prevent the collapse of water and waste-water services (see also chapter 2, on economic instruments and financing).

5.3 Montenegro

Water resources

In Montenegro the surface water resources include rivers, lakes, and the Adriatic coastal waters. The most important river systems are the Moraca/Zeta the Lim and the Tara/Piva. Skadarsko Jezero, which borders Albania, is the largest lake in the Balkans, with a surface area of 391 km^2.

Water supply

Most drinking-water supplies in Montenegro come from pristine, groundwater sources, primarily springs, which provide 70% of the drinking water. Of the 25 municipal water-supply systems in Montenegro, only two (Pljevlja and Nerceg Novi) use surface water. The municipal water-supply systems supply 213 settlements (40 urban and 173 rural) and approximately 500,000 people. Some 90% (91.1%) of the population receives piped water into the house or garden. There are frequent interruptions in service, particularly in the summer. Of the 109,403,000 m^3 of drinking water produced annually, only 48% is delivered; 52% is unaccounted for. Elimination of these enormous water losses should be amongst the sector's top priorities. The main water-supply problems in Montenegro are: (i) insufficient water quantity for the coastal cities during the summer tourist season, when the population rises from 180,000 to 500,000; and (ii) pollution by municipal and industrial waste-water discharges.

Water quality

The quality of most Montenegrin surface waters is generally adequate during most of the year, but there are exceptions and hot spots. Water quality monitoring of the rivers, lakes and coastal waters reveals the negative impact of industrial and municipal waste-water discharges. The most polluted are two small rivers in the vicinity of Pljevla in northern Montenegro – the Vezisnica and the Cehotina. The stretch of the River Ibar also exceeds standards for BOD, ammonia, phosphates, nitrates, phenols, detergents, mineral oils, manganese, mercury and pathogens. The water quality of Skadarsko Jezero meets all water quality standards for its category, with the exception of ammonia and the resultant eutrophication is documented in the northwest part of the lake.

Surface water quality in Montenegro is a major issue for the tourist and recreational areas along the coast. Tourism is likely to be the engine of growth for the coast, and a clean environment together with clean water and air, scenic mountains and picturesque towns are what attract tourists. The coastal marine waters are generally satisfactory, especially in open stretches; however, the more confined bays with human settlements are affected by waste-water discharges. In many cases, the coastal waters, especially those near Sutomore, Bar and Ulcinj, do not meet bacteriological standards for bathing water in the summer. The exclusive resort of Sveti Stefan has one of the most highly polluted beaches in the country. Increased phosphates and detergents near Budva and Bar are creating problems. Of the closed harbour towns, only Tivat meets the highest water quality standards. Signs of eutrophication have been observed in Herceg-Novi, Kotor and Tivat, probably due to discharges of untreated waste water. The expected increase in the number of tourists along the coast, particularly in the hot period of year, could result in bigger waste-water discharges in the Adriatic Sea, with their consequent effect on water quality (see also chapter 14, on tourism and the environment)

Despite the good quality of groundwaters in Montenegro, the quality of drinking water has

deteriorated with 25% of samples in 2000 below bacteriological standards. The range of unacceptable water varies significantly by region, with coastal cities generally faring the worst (Table 5.8). Larger cities, e.g. Podgorica and Danilovgrad, are more likely to be able to afford the disinfection of drinking-water supplies, which is reflected in the higher water quality figures, more than 97% of samples meet bacteriological standards. While many cities have seen improvements in their drinking-water quality in terms of bacteriological standards since 1997, e.g. Podgorica, Kotor, Berane, others have seen a sharp decline in water quality, e.g. Ulcinj, Tivat, Bar. Similarly with chemical standards, several municipalities, e.g. Ulcinj, Tivat, Andrijevica, have seen quality decline sharply since 1997. Drinking-water quality in Podgorica has improved overall during the past four years.

There is some evidence suggesting that the water quality of rural water systems is even worse than that of the urban systems. A survey conducted by the Montenegro Institute of Public Health in 2001 showed that, out of 194 private wells that were analysed in rural areas, 120 (62%) did not comply with bacteriological standards.

Sanitation and waste-water treatment

Only 60% of homes are connected to a public sewerage system, with large regional differences. Sewerage systems have been established in the central parts of Podgorica and many of the larger towns in Montenegro but are usually not extended to the town outskirts. The Podgorica waste-water treatment plant was designed for 55,000 people and is now servicing 150,000. This means that a large percentage of the waste water collected is discharged untreated. Outside Podgorica about 55% of dwellings are connected to sewerage systems. In five municipalities the coverage is above 90%, while in nine the figure is below 50%. Kolasin, Tivat and Bijelo Polje have no systems at all. No urban community has a comprehensive sewerage system. The systems are all dilapidated and out of date. In smaller towns and rural settlements sewerage systems are non-existent. A total of 28.2% of the population uses septic tanks and absorbing wells (wells previously used for drinking water converted to disposal sites) for waste-water disposal. Tanks that collect waste water and sludge from septic tanks dump their contents into rivers or pour it on the ground.

At least 18 million m^3 of municipal waste water is discharged each year into rivers and gorges, often in the vicinity of urban areas, sometimes close to drinking-water sources. An unknown volume drains directly into the ground. Commercial enterprises use water from the existing networks and discharge it polluted into the city sewerage system. No information on industrial discharges is available.

Table 5.8: Percentage of samples not meeting bacteriological and chemical standards, 1997 and 2000, in selected cities

City	% samples not meeting bacteriological standards		% samples not meeting chemical standards	
	2000	1997	2000	1997
Ulcinj	47.6	25.0	28.6	6.0
Tivat	31.8	5.9	54.9	23.6
Andrijevica	22.9	25.0	50.0	25.0
Bar	21.2	11.7	3.6	7.7
Pluzine	20.4	25.0	20.4	14.9
Kotor	16.7	32.7	16.7	19.2
Mojkovac	16.6	14.3	32.6	60.7
Kolasin	15.6	7.3	29.6	16.7
Budva	9.5	1.2	1.9	0.0
Berane	2.6	12.6	3.6	13.7
Danilovgrad	2.5	8.3	6.6	13.6
Podgorica	2.8	11.2	3.7	33.0

Source: Statistical Yearbook 2000 on Population and Public Health in Montenegro. Podgorica, 2001.

Policy objectives and management

The policy framework

In Montenegro's Economic Reforms and Recovery Strategy environmental issues are reflected in a special programme for infrastructure development, highlighting the need to develop and improve the water supply and waste-water treatment. The programme also emphasizes the urgency of an integrated coastal zone management strategy, to steer the development of tourism in Montenegro. The Long-term Water Supply Protection for Montenegro Study, adopted in 1999, is the foundation for water-supply development in Montenegro.

The legal framework

The Law on Waters is the legal basis for water protection in Montenegro. By-laws cover a range of topics (Box 5.4).

The institutional framework

Like Serbia, responsibility for water management in Montenegro is shared amongst ministries and the municipalities. The Ministry of Agriculture, Forestry and Water Management and the Ministry of Environmental Protection and Spatial Planning have some responsibilities. The Ministry of Environmental Protection and Spatial Planning has taken the lead in sector planning and organization, including the involvement of the private sector. All water sector infrastructure belongs to Montenegro. It delegates its use and the responsibility for service provision to municipalities, each with its own water company. The Institute of Public Health in Montenegro is responsible for monitoring drinking-water supplies and has the authority to close systems that do not produce water according to standards.

Water management

The water management problems in Montenegro are essentially the same as those noted for Serbia. While the privatization of the water sector is under consideration in Serbia, Montenegro is piloting a new approach to utility management involving the private sector. A public-private partnership for utility management called Monte-Aqua has been formed by merging the assets of four principals: (i) Aquaregia Public Company, created by merging the water companies of Ulcinj, Bar, Budva, Tivat, Kotot, Herceg Novi and Ceinje, and the Montenegrin Seaboard Regional Network Public Company; (ii) a German company, Aquamundo, which sponsors the project; (iii) DEG Investment Fund from Germany; and (iv) a private company, Mercur, from Budva. Monte-Aqua will rehabilitate, upgrade, extend and manage the water supply and sanitation services of the area under its responsibility. Six of the seven coastal municipalities that will be part of this regional scheme have signed letters of intent to participate in the programme according to the concept of public-private ownership. Phase I of this programme started on 16 January 2001, with financing from KfW and GTZ (DM 14.5 million) for technical assistance and urgent investments in rehabilitation and improved operations.

The investment for all town water-supply networks and the Montenegrin Seaboard Regional Water Network to 2020, as well as investment in priority facilities and work for improvements and further development, is €178.55 million. Of this, 52% will be used to complete the construction of the Montenegrin Seaboard Regional Water Network (€89.76 million), 44.5% would be allocated to all other town water networks and 3.8% to rural water networks (€6.74 million). Investment into priority facilities and work that is needed to improve the present water-supply systems is €19.66 million.

User charges for water supply and waste-water services are kept low by local authorities, since they are considered "social services". Like Serbia, charges are not sufficient to cover maintenance or even, at times, operating costs related to these services. Low collection rates and system inefficiencies are also among the reasons why the public utilities are incurring such high losses, which have to be covered by the municipal and central governments, increasing their budget deficits. However, some steps are being taken to achieve cost recovery through charges. In Podgorica, charges for water supply, waste and waste-water collection were raised significantly in early 2002.

Box 5.4: Legal framework for water management

- The Law on sea and internal shipping (Nos. 13/78, 8/79, 19/87, 36/89, 13/91)
- The Law on water supplying, removal of waste water and depositing of solid waste in the territory of municipalities: Herceg Novi, Kotor, Tivat, Budva, Ulcinj and Cetinje (No. 46/91)
- The Law on coastal assets (No. 14/92)
- The Law on waters (Nos. 16/95, 22/95)
- Regulations on the classification and categorization of waters (Nos. 14/95, 19/96, 15/97)
- Regulations on measuring methods and the monitoring of the quality of sea water for bathing and recreation (No. 9/91)
- Regulations on the contents of technical documentation necessary for issuing water resources compliance and water resources permits (No. 4/96)
- Regulations on keeping the water registry and surface and groundwater cadastre, the users and polluters of water, torrent flows and erosive areas and water production premises and facilities (Nos. 5/96, 19/96)
- Regulations on methods for determining and maintaining sanitary protection zones for drinking-water sources and restrictions in the related zones (No. 8/97)
- Regulations on waste-water quality and the methods of their emission into the public sewerage system and natural recipients (Nos. 10/97, 21/97)
- Decisions on establishing the Public Enterprise for the water supply, the treatment and removal of waste water and depositing solid waste for areas of the Montenegrin coast and Cetinje (No. 50/91)
- Decision on establishing a public enterprise for managing the coastal assets (No. 25/92)
- Decision on establishing a public enterprise for water resources (No. 39/92)
- Decision on criteria, level and payment methods for compensation for water pollution protection, compensation for material extracted from the pipeline system and compensation for use of water resources facilities (Nos. 15/96, 19/96, 35/98)
- Decision on starting the drafting of the spatial plan for the coastal assets (No. 16/97)
- Programme of systematic water quality investigations into water operations (the zone of sanitary protection) and public beaches (No. 13/00)
- Regulations on permitted amounts of hazardous and harmful substances in soil and water for irrigation and their testing methods (No. 23/94)

5.4 Conclusions and recommendations

Recommendation to the Federal Government and Serbia

Yugoslavia is responsible for about 13% of Danube nutrient pollution and hence contributes to the deterioration of the Black Sea ecosystem. Policies and incentives to reduce nutrient run-off in agriculture and improved municipal and industrial waste-water treatment in the Danube Basin are needed to alleviate this problem.

Recommendation 5.1:
*The appropriate authorities of the **Federal Government** and the Federal Hydrometeorological Institute should design and, in collaboration with **Serbia**'s Ministry for Protection of Natural Resources and Environment, should implement a Danube nutrient reduction investment project consistent with the nutrient reduction targets called for by the Convention on Cooperation for the Protection and Sustainable Use of the Danube River.*

Recommendations to Serbia and to Montenegro

Direct and indirect damage due to floods and non-regulated rivers is significant in Serbia and Montenegro. The approach to floods has focused on the joint use of structural mitigation measures (e.g. building and use of reservoirs and dykes) and non-structural measures (e.g. identifying hazard-prone areas and limiting their use). Preparedness, early warning and recovery measures have received less attention.

Recommendation 5.2:
***Serbia**'s Ministry of Agriculture and Water Management, in collaboration with its Ministry for Protection of Natural Resources and Environment, and **Montenegro**'s Ministry of Agriculture, Forestry and Water Management, in collaboration with its Ministry of Environmental Protection and Physical Planning, should prepare a comprehensive national flood disaster management strategy, which includes preparedness, mitigation, recovery and reconstruction. The impact of floods can be further reduced by integrating hazard mitigation measures into land-use planning and investment projects.*

Water, sanitation and waste-water management and water use are deteriorating. While statistics indicate that, in 2000, 98% of the country's population had access to safe drinking water, neither the quality nor the coverage of service is uniform. Rural areas rely heavily upon private water-supply systems that are beyond the purview of any water quality monitoring programme. Given the poor water quality in general, this situation could render rural communities and households susceptible to water-related health problems. The lack of access to water and sanitation is a major public health issue, particularly for urban slums largely inhabited by internally displaced persons, Roma and refugees. The international private sector has shown interest in the management of the larger water systems in Belgrade, Nis and Novi Sad as well as in the coastal cities of Montenegro, and its involvement in service delivery will probably be the most efficient way to address these systems' current problems. However, in contrast to the big cities' water utilities, water companies in medium-size cities and rural areas have limited access to financial resources and are not expected to attract private sector interest immediately.

Recommendation 5.3:

***Serbia**'s Ministry for Protection of Natural Resources and Environment, in collaboration with its Ministry of Agriculture and Water Management and its Ministry of Health, and **Montenegro**'s Ministry of Agriculture, Forestry and Water Management, in collaboration with its Ministry of Environmental Protection and Physical Planning and its Ministry of Health and Social Policy, should:*

(a) *Undertake a thorough study of rural water-supply systems, both formal and informal, as the basis for designing a programme for improving rural water supply. In Serbia, the Ministry of Agriculture and Water Management has a list of priority projects in small town and rural water-supply systems that could serve as the basis for an assessment of rural water needs. The assessment should include, inter alia, the state of the existing water-supply systems, an inventory of informal water-supply systems, an inventory of private wells and a survey of water quality in private wells;*

(b) *Provide the legal and institutional framework for monitoring, regulating and supporting the rural water sector, as a priority;*

(c) *Focus on water-supply systems for medium-size cities and rural areas. This includes urgent investment to get infrastructure working again, lower operating costs, provide operational and management information and deal with immediate water quality problems;*

(d) *Include in a rural water-supply programme a component for health education and promotional activities that would incorporate, among other things, education and training on the appropriate design and use of wells, design and use of home-made chlorination systems, school sanitation and health, and water quality monitoring in remote rural communities; and*

(e) *Give top priority to the provision of water-supply and sanitation services to communities or persons who are underserved.*

Recommendation 5.4:

***Serbia**'s Ministry for Protection of Natural Resources and Environment, in cooperation with its Ministry of Health, and **Montenegro**'s Ministry of Health and Social Policy, in cooperation with its Ministry of Environment and Physical Planning, should expand drinking water quality monitoring to rural areas.*

In most medium-size cities in Serbia and Montenegro small investments to strengthen the capacity of utilities to manage demand properly could have a quick and high return and help avert most of the current shortages. However, this action will be effective only if accompanied by adequate pricing policies and support from the municipal authorities.

Recommendation 5.5:

***Serbia**'s Ministry of Agriculture and Water Management and **Montenegro**'s Ministry of Agriculture, Forestry and Water Management should:*

(a) *In the medium term, improve the financial situation of water and waste-water utilities through appropriate pricing policies, management strengthening and better operating procedures;*

(b) *Allocate funds to achieve a cost-effective mix of institutional strengthening, improved efficiency and service expansion;*

(c) *Give priority to maximizing the efficiency of existing water utility systems with a first step directed towards reducing the huge losses in the systems; and*

(d) *Continue developing private sector involvement.*

The water utilities are not financially sustainable and all are in dire straits. There is virtually no maintenance or investment in new technology, so water services are deteriorating. If water-supply services are to improve and be sustainable in the long run, the municipal or regional sector institutions or utilities must be put on a sound financial footing. Reducing water consumption lowers operating costs and postpones the need for investment in additional capacity, thereby improving the financial situation of a utility.

Although many utilities have in the past had good experience with the adoption of metered-based billing and bill collection, most of them now collect less than 50% of their bills. Poor collection is a crucial obstacle to financial viability. Accounting systems that conform to international standards should be introduced as part of the process of strengthening water utilities.

Increased tariffs have several benefits. First, they will reduce per capita water consumption to levels that are more in line with Western European standards. Second, increased revenues will allow utilities to carry out maintenance activities, remedying physical losses. Increased revenues will also decrease the need for subsidies and make funds available for expanding services.

The following initiatives would help ensure the financial viability of the water utilities.

<u>*Recommendation 5.6:*</u>
***Serbia**'s Ministry of Agriculture and Water Management and **Montenegro**'s Ministry of Agriculture, Forestry and Water Management should:*

(a) *Reduce consumption through water-demand management and demand-reduction programmes that would include a cost-effective metering strategy, consumption-based billing, tariff levels that are sufficiently high to induce consumers to use less water, and public awareness on water conservation;*

(b) *Adopt adequate commercial management systems;*

(c) *Replace the current "basic cost-plus" tariff formula with one that provides incentives for cost reductions and allows for an acceptable level of profits and reduces large differences in tariffs among household, industrial, and other users. Targeted support for vulnerable users should be included as part of the tariff reform; and*

(d) *Improve the efficiency and reduce the operating costs of the utilities with policies aimed at: improving their financial management and control, streamlining personnel, making plant and network operations more efficient through rehabilitation and adequate maintenance, reducing water and energy consumption, using good materials, and insisting on quality civil works. These efforts should involve the customers as part of a more general effort to improve client orientation.*

Access to improved sanitation services (connections to sewage systems and septic tanks) has improved in the past ten years. In urban areas 97.6% of homes are connected to sewerage systems or septic tanks, while 77.7% of the population in rural areas has the same disposal service. About 20% of the population in rural areas still relies on the traditional pit latrine. Urban municipal and industrial waste-water discharges, largely untreated, are a major cause of water pollution. Considerable investment is needed in the sector.

<u>*Recommendation 5.7:*</u>
***Serbia**'s Ministry for Protection of Natural Resources and Environment, in collaboration with its Ministry of Agriculture and Water Management, and **Montenegro**'s Ministry of Environmental Protection and Physical Planning, in collaboration with its Ministry of Agriculture, Forestry and Water Management, should set priorities for the selection of the most urgent needs in waste-water treatment infrastructure, such as waste-water treatment plants that discharge into or upstream of vulnerable zones, e.g. drinking water resources, recreation areas, and protected areas.*

Recommendations to Serbia

Recommendation 5.8:
The Ministry for Protection of Natural Resources and Environment and its Ministry of Agriculture and Water Management should set up a methodology and related practicum (instruction) and carry out a survey of spot and diffuse pollution sources by catchment and sub-catchment, inter alia, to provide a basis for mapping pollution loads.

Recommendation 5.9:
The Ministry for Protection of Natural Resources and Environment should:

(a) Introduce standards and norms for water quality (surface and ground) taking into account physical and hydro-ecological aspects of water systems, consistent with relevant international legislation;

(b) Establish, in cooperation with competent authorities for standardization, methodological standards for sampling and laboratory analyses (chemical, microbiological, biological) of natural waters; and

(c) Initiate and enforce accreditation of laboratories that examine natural and waste waters and ensure standardized inter-calibration methods and procedures.

Recommendations to Montenegro

The threat of coastal zone deterioration in Montenegro is a crucial issue due to uncontrolled construction activities and a lack of waste-water treatment. Signs of eutrophication and bacterial contamination in tourist areas are visible. The coastal areas are also very short of drinking water during the peak summer season. There is no coastal zone management plan to guide decision-making on coastal development and pollution control. Montenegro's aspirations to develop its tourism sector (it is targeting 22 million tourist nights or four times the current figure by 2020) demand a reversal of these negative trends. Developments need to be supported by a stricter application of water, sewerage and waste-water treatment standards, investment in waste-water treatment and land management planning. Water pollution control through improved waste-water treatment should be dealt with as a priority.

Recommendation 5.10:
The Ministry of Environmental Protection and Spatial Planning, in cooperation with its Ministry of Tourism, should prepare a coastal zone management plan integrating all sectoral plans including documents for infrastructure, environmental and landscape protection, as well as municipal services development.

Recommendation 5.11:
The Ministry of Environmental Protection and Spatial Planning, in cooperation with the Ministry of Tourism, should assess the waste-water treatment improvements for the coastal cities that are currently under way through private-public partnerships in Montenegro.

Chapter 6

AIR MANAGEMENT

6.1 Yugoslavia

The Federal Secretariat for Labour, Health and Social Care is responsible for air protection in Yugoslavia. Its responsibilities include all transboundary issues and international conventions and other agreements related to the environment through its Environment Department. Its Health Department is in charge of protection against ionizing radiation and the import, export and transit of substances which deplete the ozone layer. The Federal Hydrometeorological Institute monitors the atmosphere regime and air. The Federal Institute for Statistics is responsible for the collection and reporting of statistical data and information on the environment.

Yugoslavia became a party to the UNECE Convention on Long-range Transboundary Air Pollution and to the 1984 Geneva Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) on 12 March 2001 by succession. Yugoslavia has not yet, however, become a Party to the other seven Protocols of the Convention, including those dealing with acidification, eutrophication and ground-level ozone (1999); persistent organic pollutants (1998); heavy metals (1998); sulphur (1994 and 1985); volatile organic compounds (1991) or nitrogen oxide (1988).

Yugoslavia is not a Party to the Convention on Environmental Impact Assessment in a Transboundary Context. It is a Party to the United Nations Framework Convention on Climate Change (12 March 2001), the Vienna Convention for the Protection of the Ozone Layer (12 March 2001) and its Montreal Protocol (12 March 2001).

Compliance with all of these legal instruments requires, among other things, the establishment of complete and reliable emission inventories, including the sector split as requested by the EMEP coordinating centres. To date, however, Yugoslavia has only reported data on sulphur and nitrogen oxide emissions for three sectors: energy combustion and transformation industries, non-industrial combustion plants and combustion in the manufacturing industry. It has not provided information on ammonia, volatile organic compounds (VOCs), heavy metals, persistent organic pollutants, carbon monoxide or carbon dioxide. The following laws regulate the protection of the atmosphere: the 1993 Resolution of the Environmental Policy in the Federal Republic of Yugoslavia, the 1998 Federal Law on the Basic Principles of Environmental Protection, the 1998 Federal Law on Hydrometeorological Affairs of Interest to the Country.

Yugoslavia is also responsible for reporting to the EMEP Chemical Coordinating Centre in Norway on the results obtained at two EMEP stations (Kamenicki in Serbia and Zabljak in Montenegro). The stations monitor background air pollution in order to check the rates of transboundary fluxes controlled by the Convention on Long-range Transboundary Air Pollution and its protocols and to confirm the accuracy of air models.

According to the EMEP modelling work on transboundary movements of air pollution, it was estimated that in 1998 Yugoslavia imported 195,000 tons of sulphur and exported 109,000 tons of it. During the same year Yugoslavia exported about 15,800 tons and imported about 40,100 tons of nitrogen. It is therefore in the interest of Yugoslavia, as a net importer, to join international programmes to combat transboundary pollution. With regard to the import of SO_2, the biggest depositions have come from sources in Bosnia and Herzegovina (20-30%), Romania and Bulgaria (10%). Yugoslavia's export of SO_2 is mostly to Romania, Bulgaria and Ukraine. Most of the nitrogen enters Yugoslavia from Italy, and it is exported from Yugoslavia to Romania.

Yugoslavia does not produce ozone-depleting substances. It ranks with the developing countries whose estimated yearly consumption of controlled ozone-depleting substances is less than 0.3 kg per capita. Ozone layer protection and the regulation of ozone-depleting substances are contained in the

Federal Law on the Basic Principles on Environmental Protection. The import of substances that deplete the ozone layer is addressed in the Federal Law on Customs Tariffs (No. 23/2001). There are no federal economic instruments to control air pollution. This is the responsibility of Serbia and Montenegro.

6.2 Serbia

Description and analysis of the situation

Thermal power plants, district heating, household combustion, motor vehicles and industrial facilities are the main polluting sources in Serbia. The most pressure on air quality comes from combustion processes using low-grade lignite and motor fuels. In addition, low energy prices, the irrational and inefficient use of energy, inefficient combustion technologies, poor plant maintenance and an old vehicle fleet (more than 12 years old) multiply the emission rates despite reduced economic and industrial activity (see also chapters 10, on industry and the environment, 11, on energy and the environment, and 13, on transport and the environment). As a result, emissions have not fallen as steeply as GDP, remaining in Serbia at levels that exceed both WHO guidelines and EU directives (see table 6.1).

The main polluters are thermal power plants located in the lignite basins of Kolubara and Kostolac. The Kolubara basin (Nicola Tesla A and B and Kolubara A), with 3,160 MW of installed power, emits 162,800 tons of SO_x, 38,280 tons of NO_x and more than 18,000 tons of particles a year. The Kostolac basin, with 1,007 MW, releases 100,000 tons of SO_x, 8,770 tons of NO_x and 6,340 tons of particles a year. (Values are estimated and calculated by the thermal power plant operators on the basis of process mass balance.) Thermal power plants also generate 6 to 8 million tons of low-toxicity dust, which is stored improperly, causing uncontrolled secondary emissions (see also chapter 8, on mineral resources management).

Other important sources are the refineries in Pancevo and Novi Sad, the cement factories in Para and Kosjeri and the chemical and metallurgical plants, also located in Pancevo. In general, their technologies use raw materials and energy inefficiently, there is a lack of end-of-pipe treatment and poor operation and maintenance. A significant amount of air pollution originates also from the inadequate storage and deposition of raw materials, including from ore mines. (see also chapters 8, on mineral resources management and 10, on industry and the environment)

Ageing vehicles, most of them imported recently in great numbers, still use leaded petrol and illegally imported low-grade motor fuels. There are no plans to introduce inspection for vehicles in use, to improve their maintenance or to phase out leaded petrol. It is interesting to note that the domestically produced car, the YUGO, is manufactured with catalytic converters for export only. Traffic pollution, including soot concentrations, is increasing in general in the bigger cities. The Ministry for Transport and Telecommunications has no clear road transport policy promoting sustainable transport and sustainable mobility. It can therefore be expected that the share of transport emissions in the national total will grow and related environmental problems will accumulate leading to chronic health problems for the most exposed population (see chapter 13, on transport and environment).

Energy policy is beginning to change. The Ministry of Energy and Mining has plans to establish a new energy efficiency agency, and it has begun to increase energy prices. At the moment, however, prices are too low to encourage efficiency and a decrease in consumption (see also chapter 11, on energy and the environment).

Monitoring

Public health institutes began to measure concentrations of air pollutants in 1953. However, the air monitoring network was set up in response to the 1988 Law on Hydrometeorological Affairs of Interest to the Country. It has been designed at several levels: there is a basic network of 11 hydrometeorological stations, another basic network of 14 urban hydrometeorological stations, and a local urban monitoring network for major air pollutants (28 measurement sites) and specific air pollutants (16 measurement sites). One meteorological station, Kamenicki, has been included in the EMEP network.

The Air Quality Control Programme was adopted in 1993 by government decree, and the results are published regularly in the Official Gazette of Serbia. The first Programme was carried out for the period 1994-1995 and the most recent for the period 2000-2001. The Programme was designed by a team of experts led by the Directorate for Environmental Protection of the Ministry of Health and Environmental Protection on the basis of

relevant international guidelines. The last Programme was jointly executed by the Republic Hydrometeorological Institute and 23 Institutes of Public Health. The Public Health Institute in Belgrade, as a leading expert institute in this area, guides the monitoring work.

The 2000/2001 Programme covered major air pollutants in 42 of the 53 towns planned, and specific air pollutants in 6 of the 14 towns planned. The reduction was due to a shortage of funds.

According to the monitoring data, maximum allowable concentrations of SO_x, soot and total deposited matter (TDM) were exceeded quite frequently in bigger towns and in the vicinity of operating industries. Specific pollutant standards were also exceeded around industries, particularly with respect to hydrocarbons (4 to 20 times the imissions limit values (ILV)) in most of the towns and fluorides (e.g. Pancevo measured 3 to 4 times ILV). Using an index of ambient air quality that included SO_x, NO_x and soot, five out of twenty locations where the index was applied were classified as unhealthy. These are Belgrade, Nis, Sabac, Kragujevac and Bor.

Policy and legal framework, including institutional set-up

The policy framework

The short-term policy framework was designed in 2001 as part of the Reform Agenda for Serbia. For air management, objectives included capacity building to apply preventive and control measures against air pollution, and full compliance with the polluter pays principle and with the basic obligations of relevant international conventions, including, in the first instance, the UNECE Convention on Long-range Transboundary Air Pollution. The main challenge for the near future is rehabilitation of the identified environmental "hot spots".

As part of its response to the full range of environmental issues, including air pollution, in May 2002, Serbia established a new Ministry for Protection of Natural Resources and Environment and drafted a new framework law on the environmental protection system. The draft framework law calls for the establishment of a national programme for environmental protection that would include the protection of air and the atmosphere.

The legal framework

The 1991 Law on Environmental Protection regulates air protection issues, including the spatial planning and construction of polluting sources, the financing of mitigating measures, inspection and penalties for non-compliance. In addition, article 110 requires that existing facilities that represent a risk to the environment should be reconstructed in order to meet prescribed conditions and environmental protection measures, and that the Ministry should specify the sources of pollution and deadlines for such reconstruction.

The Law is supplemented by the 1992 Regulations on environmental impact assessment (EIA) of facilities and construction work, which list 60 types of installations, activities and construction work that require the assessment of direct and indirect impacts on the environment. The Regulations also determine the methods for performing EIA and its verification. EIA includes two phases: pre-analysis and detailed analysis. The aim of the pre-analysis is to estimate the possible environmental impact, including air quality, during the construction of a facility, by the facility itself and the planned production processes, and to propose measures to comply with ambient air quality standards. The detailed analysis offers a full study on the possible impact of the facilities and their activities on ambient air for decision makers and the general public. This is the most important legal tool the Ministry has at its disposal.

In its EIA study, an expert organization must be guided by and make full use of the 1992 Regulations on Limit Values, Imission Measuring Methods, Selection of Sample Spot Criteria and Data Collecting and the 1997 Regulations on Emission Limit Values, Methods and Timeframe for Measuring and Data Noting. Some of the Serbian standards are included in table 6.2 for comparison with those of the EU and WHO.

The 1992 Regulations and the 1997 Regulations also require compliance with international obligations with respect to air quality control by establishing a monitoring system of imissions and emissions and assessing their impacts on human health, the environment, nature protection and the climate. Since Yugoslavia has ratified, inter alia, the 1985 Vienna Convention and its 1987 Montreal Protocol on Substances that Deplete the Ozone Layer, the United Nations Framework Convention on Climate Change and the Convention on Long-

range Transboundary Air Pollution, Serbia has to comply with these obligations.

Should the new draft law on the environmental protection system be adopted, it will substantially improve the EIA procedure by strengthening the role of ecological permits to be issued prior to an operating permit.

The draft law on the environmental protection system, if adopted, would also introduce comprehensive environmental management, calling for the planning and sustainable use of natural resources (ambient air) and energy, the introduction of more energy-efficient technologies, the gradual use of renewable natural resources and the implementation of economic instruments for financing environmental protection, including cleaner air.

Other relevant laws for the air policy framework are:

- The 1994 Law on Corporation Profit Tax, which gives the taxpayers a stimulus in the form of the right to an accelerated amortization of equipment to prevent pollution and save energy;
- The 1994 Law on Personal Income, which excludes investment in equipment to protect the environment and save energy from taxable income; and
- The 1994 Law on Property Tax, which provides tax relief to property owners who install facilities to control air pollution.

The institutional framework

The Ministry of Health and Environmental Protection, through its Directorate for Environmental Protection, was responsible for developing laws and regulations and designing appropriate policy instruments for air protection until May 2002, when the new Ministry for Protection of Natural Resources and Environment was established. Among the latter's functions are the protection and sustainable use of natural resources, including air.

Also important for air pollution matters are the Ministry of Energy and Mining, the Ministry for Transport and Telecommunications and the Ministry for the Economy and Privatization.

Air polluting processes are supervised by the Environment Inspection Unit in the Ministry. In general, inspectors have to measure emissions and imissions, monitor compliance with the permit and, in case of non-compliance, oblige the polluters to improve the situation.

According to articles 20 and 22 of the 1991 Law on Environmental Protection, local authorities are also responsible for monitoring emissions through

Table 6.1: Anthropogenic SO_X and NO_X emissions in Serbia from stationary sources

thousand tons per year

	1980	1985	1990	1995	1996	1997	1998
SO_X	345	406	432	393	369	444	443
NO_X	40	49	56	50	48	56	56

Source: Jadranko, S. Environmental Management and Sustainable Development in Yugoslavia. Belgrade 2002. Also EMEP (web site http://www.emep.int/).

Table 6.2: Selected ambient air quality standards in Serbia and Montenegro and their comparison with those of EU and WHO

Air pollutant	Unit of measurement	Serbia	Montenegro	EU Directive 96/62/EC	WHO guideline values 2000
Sulphur dioxide	Microgram/m^3	150 (24 h)	110 (24 h)	125 (24 h)	500 (10 minutes)
Soot	Microgram/m^3	50 (24 h)	60 (24 h)	..	Dose-response
Nitrogen dioxide	Microgram/m^3	85 (1 h)	80 (30 minutes)	40 (1 h)	200 (1 h)
Carbon monoxide	Milligram/m^3	5 (8 h)	10 (30 minutes)	..	10 (8 h)
Ozone	Microgram/m^3	85 (1 h)	..	..	120 (8 h)

Source: Directorate for the Environmental Protection. Air Pollution in the Republic of Serbia 2000. Belgrade 2001. WHO Regional Office for Europe. Air Quality Guidelines, second edition. Denmark, 2000.
Note: "averaging time" in brackets.

authorized expert organisations and designing local action plans for improving air quality, if necessary. However, high centralization and a lack of resources have prevented the municipalities from fulfilling this function.

Inspection has been weak and largely reactive to citizens' complaints. Inspectors have been hampered by the questionable reliability or lack of emission and imission measurements. Inspection has also been hindered by the failure, in some instances, of municipal and other authorities, to insist on the legally required environmental impact assessment before issuing construction and operating permits.

In 2000, there were 4,560 inspections in Serbia, about one third of which resulted in an official decision against the polluter. The largest number of complaints was ledged either against new facilities that had been subject to an environmental impact assessment but were failing to implement the required control measures and those that had been given permits without undergoing EIA. In general, VOC emissions were the main cause of the civic actions.

6.3 Montenegro

Description and analysis of the situation

The daily concentrations of common pollutants in urban areas generally meet the standards set in the 1982 Air Quality Standard Regulations and the WHO guideline values (see table 6.2, above).

In 2001, the trend in smoke and sulphur dioxide pollution declined to the levels of the mid-1970s in Podgorica and Pljevlja. However, 30-minute concentration limits of specific pollutants are quite often breached. The worst case is fluoride pollution in Podgorica, in the vicinity of the aluminium combine, where standards are exceeded by a factor of 10 to 20. Annual mean concentrations of fluorides also breach the maximum allowable concentrations in Pljevlja and Niksic.

In Montenegro, too, thermal power plants, district heating, household combustion, motor vehicles and industrial facilities are the main polluting sources. The most pressure on air quality comes from combustion processes using low-grade lignite and motor fuels. SO_x and NO_x emissions in 1998 were estimated at about 80,000 tons and 10,000 tons respectively, and since 1995 they have been slowly rising (see table 6.3).

The lignite-fuelled thermal power plant in Pljevlja and the local opencast mine (210 MW) are the single worst sources of emissions of common pollutants. In 1999, the Government adopted an action plan to decrease the environmental pressure of the complex. It included 57 control measures costing €90 million, to be completed by 2007 jointly by Montenegro, the municipality and the industry. To date, only seven of these measures have been implemented, with minimal benefit to the environment. Most of the 57 measures are directly related to decreasing air pollution through more energy-efficient combustion and the application of control techniques like flue gas desulphurization.

Other thermal power plants of lesser importance serve industrial processes, namely iron and non-ferrous metal industries. Low energy efficiency and the lack of end-of-pipe treatment result in high emission rates and frequent air pollution episodes (see also chapter 10, on industry and the environment).

Another important stationary source of emissions is the aluminium combine in Podgorica (Kombinat Aluminijuma Podgorica, or KAP), including its own oil-fuelled power plant, which burns 80 kilotons of heavy oil containing 2% of sulphur. KAP operates without any preventive or control measures and emits not only common pollutants but also such air toxics from the anode baking plant and the electrolytic process as fluorides, fluorocarbons, phenols, polycyclic aromatic hydrocarbons (PAH) and polychlorinated biphenyls (PCBs). Other significant polluters are the Boris Kidric ironworks, in Niksic, which release heavy metals, PAH and toxic particular matter into the atmosphere (see also chapter 9, on biodiversity conservation and nature protection).

As with Serbia, Montenegro is also affected by an increasing number of imported old vehicles, using leaded petrol and illegally imported low-grade motor fuels. Due to the increased number of motor vehicles, the annual mean concentration of hydrocarbons, such as methane, exceed maximum allowance concentrations by 400 to 2000% in all 21 cities of Montenegro (see also chapter 13, on transport and the environment).

There are also quite important secondary emissions from the self-burning of opencast lignite mines, road-building and repair, and uncontrolled waste dumps. Meteorological conditions and the

topography of the country increase the impact of this type of pollution.

In general, emission sources, both stationary and mobile, suffer from outdated and poorly maintained technology, the inefficient use of raw materials and energy, and a lack of control measures. Montenegro does not appear to have any immediate plans to introduce cleaner production or energy-efficiency programmes, or other energy-saving measures (see also chapters 10, on industry and the environment and 11, on energy and the environment). Moreover, there are insufficient emission data, either by sector or by industry, and there is no republic-wide emission inventory.

Monitoring

The 1980 Law on Air Protection called for the continuous measuring of air quality at fixed stations located both in and outside urban settlements. The Law also appointed the Republic Institute of Public Health and the Republic Hydrometeorological Institute as the responsible institutions for carrying out this task.

The continuous monitoring programme began in 1982, when Montenegro adopted and financed its Air Pollution Monitoring Programme. The Programme set up an air quality measurement network with 19 measuring stations in 17 cities. Nearly all were the meteorological stations of the Republic Hydrometeorological Institute.

In 1996, the Montenegrin Centre for Ecotoxicological Research (Eco-Centre) was established by the Government in order to respond promptly and effectively to problems related to analysing toxic substances in all environmental media, and to provide relevant studies on their impact, including on human health. A significant amount of money was provided by the State budget to purchase state-of-the-art laboratory equipment for the Eco-Centre. In 1998 the Eco-Centre began operating on a commercial basis and in 2001 already earned approximately US$ 850,000, an amount almost equal to all the eco-charges collected.

For air monitoring, the Eco-Centre designated its own measuring sites located in urban and industrial areas (19 sites in 17 cities) and along the road axes (35 sites in 11 cities), where it regularly takes samples of both common and specific pollutants. The samples are then analysed in the stationary laboratory, and their results are transmitted to the Ministry. The Eco-Centre can also use its mobile laboratory for measuring imissions of basic pollutants in cases of accidental pollution.

In parallel, the Republic Hydrometeorological Institute takes daily measurements, primarily of smoke, sulphur dioxide and the chemical composition of precipitation, in its meteorological stations, including one EMEP station in Zabljak, using a methodology that is different from that of the Eco-Centre. The results are sent to the Ministry, which supports the Republic Hydrometeorological Institute with staff salaries only. Any modernization or investment in new equipment is therefore excluded. Moreover, the Institute has no legal authority to operate on a commercial basis.

Together the three institutions (Eco-Centre, Hydrometeorological Institute, and public health institutes) measure SO_x, NO_x, NH_3, ozone, smoke, hydrogen sulphide (H_2S), formaldehyde, fluoride, phenol, suspended particulate matter (SPM) and the heavy metals content of SPM. The public health institutes are primarily concerned with areas around cities and industrial facilities for their epidemiological studies.

The results of the monitoring programmes were analysed and are contained in the last Air Quality Report (2000). No such report was produced for 2001, due to the lack of a computerized system and a shortage of staff. Consequently, the available results have not been yet interpreted for Montenegro as a whole.

Table 6.3: Anthropogenic SO_X and NO_X emissions in Montenegro from stationary sources

thousand tons per year

	1980	1985	1990	1995	1996	1997	1998
SO_X	61	72	76	69	65	78	78
NO_X	7	9	10	9	9	10	10

Source: Ministry of Environmental Protection and Physical Planning of Montenegro. Institutional Framework and Legislation-Specific Regulation and Standards, 2002.

In addition, a common interpretation of all the data collected by the three institutions is difficult, because their methodologies, the frequency of their sampling and the location of their measurement sites differ. In fact, there are considerable differences in the values measured at different sites by different institutions in the same cities and for the same purpose. For example, the annual SO_x concentration in Podgorica varies from 4 (Hydrometeorological Institute) to 12 microgram/m^3 (Eco-Centre), while in Pljevlja, it varies from 20 (Hydrometeorological Institute) to 157 microgram/m^3 (Eco-Centre). These differences can be partly explained by the analytical equipment used and the frequency of measurements; Hydromet takes them practically daily, while Eco-Centre from 1 to 15 times a month depending on the location.

The Ministry is now developing an environmental information system, but it is only at the first, conceptual phase. At present, information on pollution can reach the public only through media announcements initiated by the Ministry, which also decides whether or not to involve the public in environmental decision-making (EIA).

Policy and legal framework

The policy framework

In March 2001 the Government of Montenegro adopted a document entitled "The Developmental Directions of Montenegro as an Ecological State", which can be considered as the country's long-term sustainable development strategy. For air management, the strategy identifies a number of objectives intended to prevent air pollution, improve the legal and regulatory framework and align it with EU requirements, establish an air monitoring and information system and strengthen public participation in the improvement of air quality.

The legislative framework

The 1996 Law on the Environment has a direct impact on air management since it prohibits any release of polluting substances into the air in excess of prescribed limits; introduces instruments such as environmental impact assessment for new facilities that may have adverse effects on air quality; requires environmental protection programmes for existing facilities, e.g. Pljevlja Power Plant and KAP; and introduces the polluter-pays principle, the user-pays principle and environmental inspection.

However, air management is still subject to the 1980 Law on Air Protection. The Law defines air protection and designates the areas where more detailed regulations should be adopted. According to article 8, the town and country planning system is the primary system of advance control of air pollution, and calls for the preparation of plans by local authorities to protect human settlements from activities causing air pollution. The Law also licenses polluting activities in accordance with emission limit values and imposes self-monitoring, record-keeping and reporting to the authorities. Article 19 imposes continuous air monitoring.

Maximum allowable concentrations of specified substances in the air are regulated by the 1982 Air Quality Standards Regulations. They set limit values of ambient air concentration for many pollutants, including sulphur dioxide, nitrogen dioxide, nitrogen monoxide, fluoride, smoke, SPM, selected heavy metals and inorganic and organic substances. Some of their standards are included in table 6.2 (above) for comparison with those of EU and WHO.

Subsequent Regulations, adopted in 1982 and revised in 2001, establish maximum allowable concentrations of air emissions for a range of sources, including the metallurgical and chemical industries, energy generation, waste treatment and motor vehicles. The 1997 Law on Environmental Impact Assessment (EIA) (No. 14/97) regulates the EIA procedure and makes it obligatory for 79 source categories.

The institutional framework

Following the reorganization of the government administration in 2001, the Ministry of Environmental Protection and Physical Planning became responsible for the implementation of the legal and regulatory framework described above. In particular it is responsible for issuing ecological permits on the basis of previously prepared environmental impact assessment statements, monitoring compliance with the permits through air monitoring and inspection, and, finally, designing and implementing action plans to improve air quality around the facilities built before the Law on EIA was adopted. The Ministry works closely with the Republic Hydrometeorological Institute and the Centre for Ecotoxicological Research. The Ministry

of Health is responsible for protecting public health against air pollution.

Other institutions worth mentioning with respect to air management are the Ministry of Industry, Energy and Mining, responsible for energy policy and power supply, and the municipalities, which take measures to protect nature, forests and parks of local importance, including measures to reduce the impact of air pollution.

There are four environmental inspectors in the Environmental Inspection Unit of the Ministry of Environmental Protection and Physical Planning. However, the Unit lacks virtually everything, sampling and analytical equipment, computerized offices, a mobile laboratory and even a data storage and retrieval system. Inspection can therefore only be undertaken under contract with expert organizations.

Economic instruments

Air protection-related eco-charges are prescribed by article 35 of the 1996 Law on the Environment and include investment charges and pollution charges pursuant to the polluter-pays and user-pays principles. They should be payable for air emissions, the consumption of fossil fuels and the use of substances that deplete the ozone layer. However, in practice, they are applied only to the consumption of fossil fuels, depending on the thermal input of boilers or process heaters. Rates vary (as of 1 March 2000) from €400 per month for a thermal installation of 1 to 10 MW to €7,500 for an installation of more than 200 MW.

In 2001, approximately US$ 1 million was collected, most of it as carbon taxes, e.g. on the use of fossil fuels. Air emission charges cannot be levied, because ecological permits do not contain the emission limits demanded by the regulations in force.

6.4 Conclusions and Recommendations

Recommendation to the Federal Government, Serbia and Montenegro

Yugoslavia is changing its policy toward combating air pollution and is already a Party to a number of international environmental conventions directly related to air protection, which call for a modern approach to transboundary air pollution. Particularly worth mentioning are the Convention on Long-range Transboundary Air Pollution, the United Nations Framework Convention on Climate Change and the Vienna Convention for the Protection of the Ozone Layer. However, of the eight protocols to the Convention on Long-range Transboundary Air Pollution, Yugoslavia is Party to only one, on Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP).

Of particular importance are its three most recent protocols:

- The Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg, Sweden, 1999), which sets emission ceilings for 2010 for four pollutants: sulphur, NO_x, VOCs and ammonia, and limit values for specific emission sources (e.g. combustion plant, electricity production, dry cleaning, cars and lorries);
- The Protocol on Persistent Organic Pollutants (Aarhus, Denmark, 1998), which focuses on a list of 16 substances, including 11 pesticides, 2 industrial chemicals and 3 combustion by-products/contaminants; and
- The Protocol on Heavy Metals (Aarhus, 1998), which targets three particularly harmful metals, cadmium, lead and mercury, and aims to cut emissions from industrial sources (iron and steel industry, non-ferrous metal industry), combustion processes (power generation, road transport) and waste incineration. The Protocol also requires Parties to phase out leaded petrol and introduces measures to lower heavy metal emissions from other products, such as mercury in batteries.

In addition, there are two UNECE conventions that are important for dealing with transboundary issues of relevance to air pollution: the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo, Finland, 1991), and the Convention on the Transboundary Effects of Industrial Accidents (Helsinki, 1992).

Recommendation 6.1:
*The **Federal Government of Yugoslavia** should accede to three of the protocols to the UNECE Convention on Long-range Transboundary Air Pollution: the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone, the Protocol on Heavy Metals and the Protocol on Persistent Organic Pollutants.*

Chapter 7

WASTE MANAGEMENT

7.1 Yugoslavia

Federal institutions

Most functions relating to waste management fall within the competence of the constituent republics and the municipalities. However, radioactive waste management and transboundary movements of waste are the responsibility of the Federal Government, whose main institutions responsible for waste management are the Environment Department and the Heath Department (radioactive waste) of the Federal Secretariat for Labour, Health and Social Care.

The Environment Department is the focal point and competent authority for the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. It is responsible for the overall implementation of the Convention as well as for the control of transboundary movements of hazardous waste, including the issue of import, export and transit permits and information. The Laboratory for the Characterization of Waste, which forms part of the Institute for Public Health in Belgrade, is responsible for the classification of hazardous waste and is the second competent authority for Basel Convention.

Yugoslavia acceded to the Basel Convention on 18 April 2000. It has not ratified the Basel Ban Amendment or the Basel Protocol on Liability and Compensation for Damage Resulting from Transboundary Movements of Hazardous Wastes and their Disposal. The Environment Department is also the focal point for UNEP post-conflict coordinated waste management projects related to environmental hot spots. Other federal institutions with hazardous-waste-related competences include:

- The Department of Health of the Federal Secretariat for Labour, Health and Social Care (medicines, toxic, radioactive and other hazardous materials);
- The Federal Ministry of the Economy and Internal Trade (nuclear safety, including radioactive material); and
- The Federal Ministry for Foreign Economic Affairs (foreign trade).

Federal environmental policies and legal framework

The policy and legislative framework for waste management, including transboundary movements of hazardous waste, are established by the Law on Confirmation of the Basel Convention (International Agreements, No. 2/99), the 1993 Resolution on the Environmental Policy of Yugoslavia and the 1998 Law on the Basic Principles of Environmental Protection. Transboundary movements of hazardous waste are regulated by the 1999 Regulations on the import, export and transit of waste (No. 69/99).

The 1993 Resolution established the Programme for the Management of Waste, Harmful Substances and Chemicals that, inter alia, sets up a special fund for hazardous waste dumps, establishes long-term programmes for reducing hazardous waste, identifying new ways of using solid waste, rehabilitating waste dumps and ensuring the adequate disposal of new waste by 2015, establishing a register of waste movement, and providing for risk management in industrial accidents.

The 1998 Law on the Basic Principles of Environmental Protection allows the import of waste only when needed for manufacture as secondary resources which cannot be produced within the country.

Other relevant federal legislation on hazardous and radioactive waste includes:

- The Book of Regulations for Documents Submitted with Requests for the Import, Export and Transit of Waste (No. 69/99) specifying the content of the documents required for import, export or transit permits;

- The Law on the Transport of Hazardous Substances, Nos. 27/1990, 45/1990 (latest amendment No. 21/1999), which stipulates the conditions for the transport of hazardous substances (i.e. safety measures, permits for export, import and transit, and border inspections). Approval is granted by the Federal Secretariat for Labour, Health and Social Care in cooperation with the Federal Ministry for Internal Affairs;
- The Law on Foreign Trade (Nos. 6/92, 49/92, 16/93, 24/94, 28/96, 29/97, 59/98, 44/99, 53/99 and 55/99);
- The Customs Law (Nos. 45/92, 16/93, 50/93, 24/94, 28/96, 29/97 and 59/98), which includes provisions on custom controls for goods which may be dangerous for the environment;
- The Law on Protection Against Ionizing Radiation (No. 46/96). This Law, plus six decisions on nuclear safety, as well as eleven decisions on radiation protection, provide the framework for the management of radioactive waste. The Law bans the import of radioactive waste;
- The Law on the Production of and Trade in Poison (No. 15/95);
- Regulations on Methods of Destruction of Unused and Used Poison and Material used for Packaging Poison and Methods for Withdrawing Poison from Trade (No. 7/83);
- The Law on the Production of and Trade in Medicines (Nos. 18/93, 24/94 and 25/2000); and
- Regulations on Methods of Destruction of Medicines, Subsidiary Medical Instruments and Needles (Nos. 16/94 and 22/94).

Radioactive waste

The storage of radioactive waste is a critical environmental concern in Yugoslavia. The sources of radioactive waste are two research nuclear reactors, an isotope production laboratory and a few other research laboratories that use radioisotopes, medical radioactive sources and radioactive sources from industry (spent devices).

Radioactive waste is collected in special containers and is temporarily stored at the Institute of Nuclear Sciences in Vinča in two storage facilities: one for low and another for intermediate levels of radioactive waste. The old storage facility contains about 3,500 metal barrels of 200 litres each and 300 plastic containers of 30 litres each. The facility is completely full and closed. There are two underground storage tanks, containing 330 m^3 of liquid low-radioactive waste. In addition, there are 1,500 200-litre drums stored in new facilities. The remaining capacity of the new facilities is approximately 200 200-litre drums, which will be sufficient for four to five years. Construction of a new facility for the environmentally sound disposal of radioactive waste, including its treatment, is an urgent task.

It is expected that additional radioactive waste will be generated by the decommissioning of the "Vinča" nuclear reactor.

There are several problems at the storage facility:

- The storage of radioactive waste does not meet the legal requirements;
- Neither intermediate- nor low-level radioactive solid and liquid waste is pretreated or treated;
- The old storage facilities are in extremely bad shape and require repair and reconstruction;
- The nature of the radioactive waste is not known;
- There is no regular monitoring and no maintenance of the facilities;
- Both facilities are potential sources of radioactive contamination, especially in an accident; and
- There is a lack of financial resources.

The Institute of Nuclear Sciences has already prepared a project for the construction of a permanent facility for radioactive waste, which could be built as a shallow land burial system of engineered trenches. It includes pretreatment, treatment and immobilization processes for radioactive waste. The project could be implemented, but the main obstacle is financing. Urgent measures need to be taken to determine the nature of the radioactive waste stored, to treat the waste (methods such as cementation and bituminization could be used), and to regularly monitor and maintain the facilities in order to prevent the radioactive contamination of the vicinity (the Institute is located near Belgrade).

7.2 Serbia

Waste is a pressing environmental issue in Serbia. The existing regulations on waste management are inadequate, leading to practices that are rudimentary and entailing clearly evident environmental problems.

There are 150 known disposal sites in Serbia, almost all of which lack environmental safety features. Many are located in urban areas. In addition there are numerous illegal dumps, often along riverbanks, especially in rural areas.

Serious and widespread problems are created by industrial and hazardous waste, as well as by municipal waste. There is no organized system for the collection, storage, treatment or disposal of industrial (including hazardous) waste. The current situation is endangering human health and the environment. However, action is being taken to meet some of the environmental challenges posed by waste.

Waste generation

Municipal waste

Municipal solid waste includes household waste, waste from commercial enterprises and institutions, bio-medical waste, demolition waste and street sweepings. The availability of data on waste is generally limited, and data are fragmented and based on estimates only, since there are no precise figures on waste disposal, nor any reporting system in place.

In 2001, approximately 2.2 million tons of municipal waste was collected, equivalent to about 320 kg/capita. In the same year, the municipal waste collection schemes serviced approximately 60 to 70% of the population. There is virtually no waste collection in rural areas. The amount of waste generated per person per day ranges between 0.65 to 0.85 kg, which is slightly less than in the countries of Central and Eastern Europe (1 kg/person/day). The composition of municipal waste in major cities in Serbia is shown in figure 7.1.

Municipal waste collection and disposal are in general carried out by a municipal enterprise, which in most municipalities is an independent public utility company. In some cases, it forms part of a larger public utility company which also has responsibilities in, inter alia, water management and parks (see also chapter 1, on the decision-making framework for environmental protection). The area that is covered by a regular waste collection service represents about 70% of the larger municipalities and significantly less in municipalities with more rural areas. Rural communities are rarely covered by the municipal collection schemes and either burn their waste or dispose of it at an official or illegal dump site.

There is no separation of waste components for potential recycling or composting. Furthermore, there is no separate collection or treatment of hazardous waste from households, be it lead acid batteries, mercury-containing thermometers, household chemicals, paints and other coatings and pesticides.

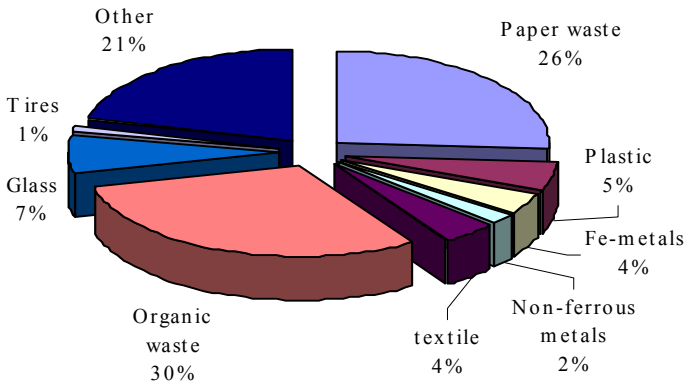
The methods and equipment used for municipal solid waste collection are broadly similar in all municipalities. The collection frequency varies from daily (in the central urban areas) to once a week in suburbs and rural areas. Common problems include inadequate and often dilapidated collection equipment, including vehicles for collection and transport, and insufficient frequency of transport. Containers intended for household waste only are also used for commercial and medical waste.

The municipal waste collected within the municipal waste collection schemes is disposed of, primarily, by open dumping. Recyclable materials such as waste paper, glass, plastic and metals are to a certain extent recovered from the disposal sites. At present, the numbers of registered recycling facilities for municipal waste (paper, glass, plastic and metal waste) are very limited.

There are 150 disposal sites for municipal waste throughout Serbia (not including Kosovo). One of the reasons for this high number is that municipalities in general are interested in having their own dumpsite, since (i) they receive an income from municipal waste charges and (ii) it reduces the transport distance and therefore transport costs. Very few disposal sites are used by more than one municipality. One exception is Belgrade, where 11 of the 16 municipalities dump their waste at one disposal site ("Vinča").

Disposal sites vary significantly in size and volume. A recent survey of disposal sites in 144 municipalities carried out by the (then) Directorate for Environmental Protection (now the Ministry for Protection of Natural Resources and Environment) indicates that most disposal sites – 47% – are smaller than 5 acres; 5% are larger than 30 acres; 16% are between 5 and 10 acres, and the remaining 8% vary in size from 10 to 30 acres.

Figure 7.1: Waste composition in major cities in Serbia



Source: REC. Designing waste management strategic policy framework. March 2002.

Most disposal sites have been established without an appropriate site selection process. A large number of disposal sites do not have construction or operating permits. Numerous sites are located along riverbanks, in unused irrigation channels and often in zones where the possibility of groundwater contamination is high.

Most of the official disposal sites have no bottom sealing to prevent the pollution of soil and groundwater and there is no collection or control of drainage water. Degasification systems are rare. There are no soil interlayers to initiate the bacterial disintegration of organic components.

Bulldozers operate in a large area of the disposal sites to spread the waste and maintain open access to the collection vehicles discharging their loads. Some sites operate without bulldozers, using an unloading platform, from which trucks discharge their loads without any control.

Industrial waste

The main industrial waste generators are mining, the chemical and metallurgical industries, and the energy sector (thermal power plants). The registration of industrial waste is based on reports from industries. Although waste generators are required to report on the types and quantities of industrial waste to the Ministry for Protection of Natural Resources and Environment according to the Law on Waste Handling, only few do so. The number of registered waste generators in Serbia in 2000 was 361. Of those only 35 (9.7%) reported regularly on their waste generation. As a result, only a fraction of the real amount is registered. Data on industrial waste generation are therefore based on estimates alone.

According to the 2000 State-of-the-Environment Report, the chemical industry generates an estimated 37.6% of all industrial waste, while the metallurgical industries generate approximately 29.1%. In addition, approximately 300,000 to 500,000 tons of phosphor gypsum (waste) and around 8 million tons of ash are generated by the energy sector (thermal power plants and small boiler facilities) each year.

The amount of industrial and especially mining waste, including tailings, is likely to be high, because the industrial structure is outdated and this will presumably lead to large quantities of production waste. The fall in industrial and other production during the past ten years may not necessarily have resulted in a comparable overall drop in general waste generation.

The Recycling Agency of Serbia has recently presented data on the quantities of recyclable waste collected in Belgrade in the State-of-the-Environment Report for the year 2000. The data are presented in table 7.1.

There are few waste recycling facilities in Serbia. One good example is the solvent recovery plant "INOS" (Belgrade), which currently operates at only 20% of its capacity, because the collection system does not work effectively. Running this plant at full capacity could help to solve the problem of spent solvent, but this would require a system for the separate collection of spent solvent at industrial enterprises and municipal facilities.

Table 7.1: Recyclable waste in Belgrade

Recyclable waste	tons
Rubber waste	515
Paper waste	124
Textile waste	97
Plastic waste	1,221
Glass waste	281
Non-metal waste	168
Wood waste	2,105
Aluminium waste	34
Copper waste	16
Animal waste	16,534

Source: Serbia. State-of-the-Environment Report, 2000.

Hazardous waste

Information on the generation of hazardous waste varies. According to the 2000 State-of–the-Environment Report, approximately 260,000 tons of hazardous waste is generated per year. However, this estimate is based on data from 1993. The biggest generating sector appears to be the mining industry. Other major industrial sources are the chemical and petrochemical, the metallurgical, paper, leather and textile industries.

The Ministry for Protection of Natural Resources and Environment has recently developed a database for hazardous substances, including hazardous waste. Data have been collected on the basis of questionnaires sent to 700 enterprises. Of those 700, 361 reported that they generated waste, and 151 reported that they generate hazardous waste (equivalent to 41.83% of the registered waste-generating enterprises). Some key information from this database is presented in table 7.2.

Hazardous waste is not collected or managed (stored or treated) separately. There are no facilities for hazardous waste treatment and disposal (destruction or incineration), nor are there any storage facilities for hazardous waste. The lack of facilities is leading to a continuous build-up of hazardous waste at industrial enterprises.

Few enterprises have storage sites equipped to prevent the spreading of toxic components or their diffusion into soils and groundwater. Waste containing mercury and other heavy metals is buried without any treatment. Significant quantities of waste containing polychlorinated biphenyls (PCBs) are accumulated and stored at industrial sites.

Table 7.2: Review of hazardous substances and hazardous wastes

Districts	Hazardous substances		Hazardous waste	
	m^3	tons	m^3	tons
City of Belgrade	2,765,815	4,638,501	648	4,100,609
Severnobacki	22,365,912	343,755	2	2
Srednjebanatski	318,637,014	135,986	..	5
Severnobanatski	123,088,026	350,309	..	200
Juznobanatski	156,626,719	4,211,420	..	47
Zapadnobacki	2,105	137,323	14	..
Juznobacki	365,057,046	2,425,610	18,007	508
Sremski	3,601	1,958	3,600	72
Macvanski	10,602	64,173	10,600	507
Kolubarski	1	317	1	40
Podunavski	16,534	64,437	42	137
Branicevski	1,600,006	48,495	..	..
Sumadijski	5,456	8,982	5,380	430
Pomoravski	410,035	4,563	..	541
Borski	51	14,683,121	42	14,468,506
Zajecarski	..	12,481	..	2
Zlatiborski	251	219,125	181	159
Moravicki	7	27,194	1	26
Raski	85	136,294	..	130,584
Rasinski	8,203,285	268,589	128	28,030
Nisavski	35,022	68,760	4	34
Toplicki	415	8,573	400	136
Pirotski	..	28,453	..	34
Jablanicki	..	28,921	..	1,769
Pcinjski	4	64,513	..	12

Source: Ministry for Protection of Natural Resources and Environment, 2001.

At present, the production and use of pesticides are low – production is around 5 tons. There is only a small quantity of obsolete pesticides (Nitrofen), and this is not considered to pose any risk to the environment (see also chapter 12, on agriculture and the environment).

The classification of hazardous waste is to some extent based on that of the EU.

Medical waste

Medical waste is part of "bio-hazardous waste", which includes medical, veterinary and farming waste as well as waste from slaughterhouses, obsolete pharmaceuticals and medicine. Such waste is known to contain virulent pathogenic micro-organisms that cause infectious diseases upon contact. About 9,600 tons of bio-hazardous waste is generated annually in Serbia, about 50% of which comes from hospitals. At present such waste is not separated from municipal waste, and it is dumped in landfills without any separation or treatment. The risk of epidemic contamination of animals and people (infectious diseases) in the vicinity of landfills is very high.

Others types of waste

As a result of war damage, riverbeds and riverbanks must be cleared of unexploded devices and debris from destroyed bridges, sunken ships and a destroyed power station (see chapter 13, on transport and the environment). There is also a problem with agricultural waste, which is discharged directly into the environment or stored in ponds near farms (see also chapter 12, on agriculture and the environment).

Contaminated sites

In 1999, the United Nations Environment Programme led an assessment of the environmental consequences of the Kosovo conflict on industrial sites in Serbia. One of the conclusions of the mission, as contained in the report "The Kosovo Conflict – Consequences for the Environment and Human Settlements," was that much of the pollution pre-dated the conflict, and that there was widespread evidence of long-term deficiencies in the treatment of hazardous waste. Further to the recommendations set out in the report, including the development and implementation of detailed waste disposal plans, a number of clean-up projects have been initiated at industrial sites. These include the handling of significant quantities of toxic waste at the Zastava car plant in Kragujevac (temporary storage of hazardous waste and damaged transformers arising from the conflict as well as from production; transport and disposal of hazardous waste). For further details on industrial hot spots, see chapter 10 on industry and the environment.

Impact on the environment

The accumulation of solid hazardous industrial waste at industrial sites, or of municipal wastes at landfills, poses the particular threat of the contamination of air, soil, surface and groundwater by heavy metals (including mercury, lead, zinc, copper and arsenic) and toxic organic substances.

The waste sites are an equally urgent environmental concern. Some of the main concerns, discussed in the foregoing sections, may be summarized as follows:

- None of the disposal sites meets sanitary safety norms;
- Few disposal sites have a layer for protection against groundwater contamination, or a drainage system for the collection of rain and contaminated water;
- There are no facilities for the treatment or special disposal of hazardous waste (household or industry). As a consequence, hazardous waste is dumped with municipal waste, thereby increasing the volume of hazardous waste;
- There is open burning of municipal wastes, which may cause air contamination by toxic gases;
- There are high dust concentrations in the air in the vicinity of the disposal sites, and they too create a health risk; and
- The co-disposal of medical waste with municipal waste at municipal waste disposal sites causes risks of contamination from infectious components.

Policy objectives and management

The policy framework

With the approval of the Serbian Government's first State-of-the-Environment report in 2001 and the subsequent adoption by the National Assembly of environmental priorities, waste management has been placed high on the environmental agenda.

A policy framework for a comprehensive waste management strategy is under preparation. The policy paper sets out the strategic framework for the management of municipal, industrial and hazardous waste, including medical waste. It contains an overview of current waste management legislation, economic instruments and practices in Serbia. A number of short- to medium-term (2002 to 2007) as well as long-term (2007 to 2015) priority actions are proposed. These include legislative, economic and institutional measures to improve waste management in Serbia. Capacity-building needs are also addressed. It is proposed that waste strategy and policies should be based on the internationally recognized waste hierarchy, prioritizing efforts as follows:

- Initiatives to prevent waste generation;
- Maximum recycling and material recovery;
- The optimal recovery of energy contents in waste; and
- A minimal use of landfills.

Specific proposals include:

- The separation of waste at source;
- The construction of regional deposit sites;
- Restructuring the public utility companies and, in the longer term, the privatizing municipal waste management;
- A licensing system for hazardous waste; and
- Strengthening the use of economic instruments (increasing waste charges, further developing the deposit-refund system for packaging, increasing fines for violations of waste legislation).

It is foreseen that a number of the general environmental policy measures currently being developed will address certain aspects of waste management. These include:

- The development of a national environmental action plan, local environmental action plans and strategies for sustainable use of natural resources and protected areas;
- The strategy for environmental hot-spot remediation; and
- The development of an integral environmental information system (public awareness, civil society building, environmental education).

The legislative framework

The Law on Environmental Protection No. 66/91 (amended in 1991, 1992, 1993, 1994 and 1995) contains general principles for waste management. A new draft law on environmental protection was sent to the National Assembly in April 2002. When adopted, the new law will provide the framework for waste management and be followed by a new waste law and other regulatory instruments to address all aspects of waste management from the classification of waste, to its collection, transport, storage, recycling, recovery and disposal, including information on waste generation and management.

Other laws and regulations that relate to aspects of waste management include:

- The Law on the Handling of Waste, No. 25/1996, which regulates [non-hazardous] waste products, which can be used as secondary raw materials in the production processes. It contains provisions on the collection, processing and storage of such materials;
- The Regulation on the handling of hazardous waste products, No. 12/1995, which defines and classifies waste according to the Basel Convention. It contains provisions on the temporary storage of hazardous waste, including criteria for selecting storage sites and record-keeping on hazardous waste;
- Regulations on the criteria for determining the location and disposition of waste deposit sites, No. 54/92, which set out the criteria for selecting disposal sites for hazardous waste materials;
- Regulations on conditions of waste storage and the classification of hazardous waste based on that of the EU; and
- Regulations on the transport of hazardous substances by road and rail, No. 52/2002, which set out the competencies of the Ministry for Protection of Natural Resources and Environment in issuing permits for the transport of hazardous wastes and radioactive substances in Serbia.

In addition, there are a number of regulations on hazardous waste substances, which could be relevant to hazardous waste management (see chapter 10, on industry and the environment).

The existing legislation on waste management is fragmented and does not cover all aspects of waste management. Hazardous waste appears to be regulated through instruments governing hazardous substances rather than any specific and comprehensive waste legislation. Furthermore, current legislation on waste management does not seem to have been fully implemented or to reflect recent changes in the waste situation. Nor does it clearly allocate responsibilities and tasks to those responsible for waste management.

Economic instruments

A charge for waste collection and disposal is calculated according to the area of residential or business premises so that the charge is not directly related to the volume of waste produced. On the basis of present regulations, solid waste charges are set by each municipal service enterprise and vary widely. Collection is undertaken by communal enterprises. Before Serbia's decree on the price of communal services was issued, i.e. before February 2002, prices for households varied from 0.4 dinars/m^2 to 1.2 dinars/m^2. Since February 2002, prices for households have been 1.2 dinars/m^2 (No. 02/02). Collection rates range between 10 and 70%, depending on the collection method. Much better results have been achieved where charges for several communal services are collected together.

Practice shows that municipal waste user charges do not correspond to the costs of waste disposal and are not high enough to stimulate a change in behaviour. Current charges do not cover all treatment costs, and in many cases municipalities provide subsidies. An increase in the price of waste collection and disposal services is necessary if their full cost is to be covered. Social concerns have kept the prices lower than needed, and the present level of prices is a negligible part of household expenditure, even less than 1% per month. At the moment, there are no charges for hazardous waste in Serbia. Serbia has a well established deposit-refund system for certain beverage packaging (non-alcoholic beverage containers, wine and beer containers).

The Serbian Law on the Handling of Waste stipulates fines for enterprises and individuals. The fine for fly-tippers is 100 to 1,000 dinars. According to the Law an enterprise or legal entity that dumps dangerous waste on the ground or buries it elsewhere than in dumps or treatment plants specially provided for this purpose can be fined up to 100,000 dinars. Revenue is not earmarked for environmental purposes. The fines are not indexed to inflation, but are adjusted regularly.

Serbia's Ministry for Protection of Natural Resources and Environment is preparing a strategic policy framework for waste management that will propose strengthening existing and introducing new economic instruments. These could include: increasing waste charges and fines for violations, and developing a deposit-refund system for packaging, establishing a system of extended manufacturer's liability, restructuring public utility companies and, in the longer term, introducing a transferable licence system for hazardous waste management, and privatizating solid waste management.

The institutional framework

Responsibility for waste management in Serbia is shared between the Ministry for Protection of Natural Resources and Environment and the municipalities. The Ministry is responsible for:

- The development and implementation of overall waste management policy;
- The development and implementation of waste management legislation and its harmonization with EU legislation;
- The coordination of waste management issues with other ministries and institutions;
- The management and coordination of waste projects financed from national and international sources;
- Issuing permits for waste movements in Serbia;
- Issuing permits to facilities for waste treatment; and
- Inspecting and participating in environmental audits during privatization.

The Recycling Agency, separate from the Ministry, was established in 1998 to: establish and maintain a database on secondary materials; promote the use and marketing of secondary raw materials; conduct studies on and the analysis of technological and economic feasibility of using secondary raw materials; offer guidance on a waste classification system; and carry out training activities on waste recycling for the general public. The Agency also advises enterprises on the use of available secondary materials (in particular paper, plastic, scrap metals).

The Agency has been faced with a number of problems. One of the main difficulties is the collection of data on secondary raw materials, since it is currently carried out on a voluntary basis.

According to the Law on Local Self-Government, No. 9/02, the local development and implementation of waste management policy and the collection, transport and disposal of municipal waste are the responsibility of municipalities. There are 161 municipalities in Serbia, including 16 in Belgrade, which are responsible for municipal waste collection, transport and disposal through communal public utility companies. Municipalities are also involved in inspection, imposing fines and penalties and issuing permits for collection and treatment of municipal waste.

The Institute of Public Health in Belgrade is involved in the assessment of municipal waste sites, the definition of toxic properties and the composition of hazardous waste and their adverse effect on human beings and the environment. It also helps to conduct environmental impact assessments of existing and new landfills for municipal and industrial waste.

7.3 Montenegro

Waste is a serious problem in Montenegro, with long-term implications for soil and water quality. Of particular concern are the accumulated mining tailings and industrial waste from a closed plant (situated the bank of the Tara River), which produced zinc, lead and pyrites, and the accumulated storage of waste from the production of aluminium.

Waste generation

Municipal waste

Statistics on municipal waste generation are very poor and not comparable; they are sometimes presented in terms of weight (tons) and sometimes in terms of volume (m^3). However, it is estimated that Montenegrins generate 1 kg of municipal waste per person per day. Registered quantities and future estimates of municipal waste generation are given in table 7.3 (tons per year).

About 42% of solid waste is collected by public utility companies. There are, however, not enough refuse lorries in Podgorica and some of the smaller cities.

The composition of municipal waste is given in table 7.4

Municipal waste collected in all 21 municipalities is dumped at uncontrolled disposal sites without any separation or treatment. There are about 20 registered landfills for municipal solid waste. None of these is properly constructed or operated, nor do any of the disposal sites meet sanitary standards. Most uncontrolled and illegal disposal sites do not have access roads. The amount of waste dumped at the registered disposal sites is approximately 35,000 m^3/month. The largest landfills are those in Podgorica and Niksic.

Municipal waste from Podgorica is dumped at the Cemovsko Polje disposal site, situated 8 km from the city. The landfill has been used for 28 years and occupies 360,000 m^2. Annually about 400,000 m^3 of municipal waste is dumped there. Information varies on the quantity of waste dumped.

Waste is mainly treated by burning and covering by a layer of soil. There is no monitoring of gas emissions or leachate. Air, soil and groundwater in the vicinity of the landfill are polluted by toxic organic substances. Run-off from the landfill goes to the River Cijevna. Groundwater is filtered to Skadarsko Jezero (a Ramsar site, see also chapter 9, on biodiversity conservation and nature protection). Exact data on the quality of air, soil and groundwater do not exist. About 25,000 people live in the vicinity of the disposal site, and they are certainly exposed to toxic gases, heavy metals in groundwater and the infectious components of municipal waste.

Some projects are under way to rehabilitate disposal sites and build sanitary landfills. In February 2002, a memorandum of understanding was signed between the Government of Montenegro and the Government of the United Kingdom to carry out a feasibility study for the rehabilitation of a site. Recently a construction project for a sanitary landfill for three cities (Budva, Kotor and Tivat) has been initiated with support from the World Bank. The project will provide for the separation of papers and metals from municipal waste. Discussions are also under way with an Italian company to combine the incineration and landfilling of municipal waste in Podgorica. In Slovenia and Croatia municipal waste is incinerated in cement production, but there are no cement facilities in Montenegro.

Table 7.3: Quantity of municipal waste (registered and estimated) by year

tons

1998	1999	2001	2003	2005	2007	2009	2011	2013	2015	2017
235,829	247,863	262,092	276,320	290,549	304,777	319,000	329,100	334,900	340,800	346,700

Source: Ministry of Environmental Protection and Physical Planning, 2001.

Table 7.4: Composition of municipal waste

Component	%	Quantity (m^3)
Total	**100**	**400,000**
Paper	17	68,000
Plastics	9	36,000
Textile	5	20,000
Glass	5	20,000
Metal	4	16,000
Organic	50	200,000
Other	10	40,000

Source: Ministry of Environmental Protection and Physical Planning, 2001.

Table 7.5: Composition of "red mud"

Substances		%
Aluminium oxide	Al_2O_3	16.3
Ferric oxide	Fe_2O_3	43.8
Silicon dioxide	SiO_2	9.7
Titanium dioxide	TiO_2	6.0
Sodium oxide	Na_2O	9.2
Calcium oxide	CaO	3.8
Dry residue		7.6

Source: Centre for Ecotoxicological Research of Montenegro, 2001.

Industrial and hazardous waste

At present, industrial facilities which generate waste are the thermal power plant and the small boiler plant in Pljevlja; the Delemit Jakic wood-processing plant; the Suplia Stena zinc and lead mines; the flotation facilities in Gradac; and the aluminium plant in Podgorica (KAP).

Huge quantities of ash are generated at the Pljevlja power plant. Annually, 280,000 tons of ash and slag are deposited in a landfill located on the Paleski Potok riverbank. The main components of the ash are silicon dioxide (SiO_2) (~40%) and calcium oxide (CaO) (~20%).

An aluminium plant constructed between 1969 and 1971 is located 10 km from Podgorica in the Zeta Valley near Skadarsko Jezero. The initial capacity of the plant was 200,000 tons of alumina per year based on Montenegro's high-quality bauxite. At present, the plant operates at more than full capacity, producing 210,000 tons of alumina per year.

Approximately 350,000 to 420,000 tons of red mud (cathode production residue) is generated by the aluminium plant each year. About 7 million tons of red mud are accumulated at two disposal sites. There are also about 70 tons of PCBs, as well as phenols, mercury-containing waste, fluorides, polyaromatic hydrocarbons (PAHs), fluorine gases, and dust from coke. About 3.5 million tons of red mud are stored at the first disposal site (basin), which occupies a surface area of 170,000 m^2. The basin has an insulation layer to protect against the seepage of heavy metals into groundwater.

The second basin does not have any protection layer. At present about 4 million tons of red mud have already been dumped over 220,000 m^2. The second basin poses a serious threat of groundwater contamination, including to drinking water, because the plant is located near the city. In addition, contaminated groundwater could easily enter Skadarsko Jezero.

Red mud disposal sites are monitored for 15 polluters and the results are reported to the Ministry of Environmental Protection and Physical Planning. A dust purification system was introduced some time ago. At present, all the filters are old and out of action.

The Centre for Ecotoxicological Research monitors water quality in the vicinity of plants and has shown that the content of toxic substances in the water breaches national and international standards. Carcinogenic hazardous substances such as PCBs, PAHs, phenol, F and cyanide have entered the ecosystem and the food chain of both humans and animals, and there are high concentrations of fluorides in both the alkaline water and in the air. At present, the Centre does not have the capacity to regularly monitor these problems.

Urgent measures are needed to stop further contamination of the region. This should include: the modernization of old and obsolete technology;

the installation of purification equipment; the decontamination of polluted areas; and the construction of a new environmentally sound landfill for red mud. These measures require considerable funds. Both the Government of Montenegro and the plant management are committed to privatizing the plant as soon as possible.

In Mojkovac, there is a large amount of accumulated mining tailings and industrial waste from a plant that produced zinc, lead and pyrites. The plant was closed 10 years ago. It is situated on the bank of the Tara River. The estimated quantity of sludge is 3.5 million tons. The disposal sites occupy an area of 20 ha. The tailing pond is 12 metres deep. The River Tara is part of the Durmitor national park (see also chapter 8, on mineral resources management). The Tara River is protected by an earth-gravel dam, reinforced by concrete slabs. Water from the sites has a pH of 12 and is contaminated by sulphides and sulphates, radioactive substances, heavy and other toxic metals and pesticides. This site poses a serious threat to the population and the environment, especially in the event of an accident or heavy rainfall.

Within the REReP framework, a special proposal has been put forward to restore the dam, regulate the Tara River and rehabilitate the disposal site. The project was developed by the Ministry of Environmental Protection and Physical Planning. Once funding is secured, the project will begin with an EIA for these three tasks.

There is a similar situation in Suplja Stijena, where flotation tailings from zinc and lead production are dumped. The plant operated from 1959 to 1987, when it was closed, and then it restarted in 1996. At present, the mines and flotation facilities are closed. About 1.2 million tons of toxic tailings are deposited at the landfill, which is located on the bank of the River Cehotina. This landfill is neither monitored nor maintained. Heavy metals are washed out by rain and migrate into groundwater and into the river. So far no remediation action has been planned to solve the problem.

Contaminated sites

Cape Arza, identified by UNEP as a hot spot, is contaminated by depleted uranium. The first decontamination step has been completed, but work has been stopped because of a lack of money. About €400,000 are needed for the second step.

Impact on the environment

The disposal of municipal waste at dumps that do not meet sanitary-hygiene requirements and standards, the storage of industrial waste at uncontrolled sites and insufficient monitoring cause serious environmental problems in Montenegro. These include:

- The contamination of air, soil and groundwater in the vicinity of disposal sites (toxic gases from the decomposition of waste, heavy metals in groundwater and in soil);
- Health risks to the local residents;
- Health risks to animals that have access to disposal sites and the possibility of contaminating the food chain; and
- The risk of contaminating rivers and Skadarsko Jezero.

Policy objectives and management

The policy framework

No general waste management strategy has been developed.

The legislative framework

Montenegro does not have a law on waste management. Current legislation relevant to waste management includes:

- The Law on the Environment;
- The Law on Cleaning, Collecting and Using Waste Production, Nos. 20/91, 36/81, 2/89, 18/89; and
- The Regulations on the criteria for the selection of sites, methods and procedures for depositing waste materials (No. 56/00).

The Law on the Environment defines waste, harmful materials and hazardous materials (art. 8). It restricts the import of waste materials to waste that can also be used as secondary raw materials. The law contains provisions on the disposal of waste with harmful or hazardous properties, and calls for an environmental impact assessment of landfills for municipal and especially industrial hazardous waste treatment and disposal. The Ministry of Environmental Protection and Physical Planning is entitled to grant approval on the basis of the EIA, and it is responsible for the development and monitoring of emission standards and norms.

The Regulations on the criteria for the selection of sites, methods and procedures for depositing waste materials sets out the conditions for selecting both temporary and permanent storage sites for waste containing hazardous material. These conditions meet recent European standards, including the requirement of a protective layer to prevent groundwater contamination, the introduction of a drainage system, the special geological condition of sites, and keeping storage sites at least 1 km from riverbanks and human settlements.

In general, the current legislation on waste management does not seem to have been fully implemented.

Economic instruments

The Law on the Environment provides for tax deductions and other incentives for enterprises involved in collection and processing secondary materials and waste (recycling).

The institutional framework

Competence and responsibility for waste management are shared among the Ministry of Environmental Protection and Physical Planning, municipalities and industry.

The Ministry is responsible for issuing permits for landfills for municipal and industrial waste, for monitoring the results of environmental impact assessments for landfills, for collecting information for waste inventories and for carrying out inspections. The municipalities are responsible for municipal waste management. Waste management is carried out by local public utility companies. Industry is responsible for reducing waste generation and disposing of waste in an environmentally sound manner (see also chapter 10, on industry and the environment).

7.4 Conclusions and recommendations

Recommendations to the Federal Government

The storage of radioactive waste is critical; it does not meet environmental requirements or radioactive safety norms. The rehabilitation of storage facilities is urgently required to prevent radioactive contamination in nearby areas. There is also an urgent need to define the composition of radioactive waste stored at the Institute for Nuclear Sciences, to treat this waste, to begin regular monitoring and to improve facility maintenance.

Recommendation 7.1:
*The **Federal Secretariat** for Labour, Health and Social Care should:*

(a) *Urgently find funding for the Institute for Nuclear Sciences in order to define the composition of radioactive waste stored in the Institute's facilities;*

(b) *Introduce treatment facilities and the environmentally sound disposal of radioactive waste; and*

(c) *Regularly monitor and maintain the facilities so as to prevent radioactive contamination in the vicinity of Belgrade.*

While the Environment Department of the Federal Secretariat for Labour, Health and Social Care is responsible for the implementation of the Basel Convention and for issuing permits for the import, export and transit of hazardous and other waste (Basel waste), the Governments of Serbia and Montenegro, pursuant to their legislation, are responsible for waste, including hazardous waste, waste management policies and legislation. This may lead to cases of conflicting requirements for hazardous waste, including its classification. A clear definition of administrative responsibilities and efficient coordination among the institutions involved in the control of transboundary movements of hazardous waste and their disposal should be seen as a priority, particularly in the context of the current review of constitutional competencies in Yugoslavia (see also chapter 1, on the decision-making framework for environmental protection).

Recommendation 7.2:
*The **Federal Secretariat** for Labour, Health and Social Care should:*

(a) *Prepare a proposal for the harmonization of all existing laws and regulations on hazardous waste, in cooperation with the competent authorities in Serbia and Montenegro; and*

(b) *Establish a coordination structure and procedures for the control of transboundary movements of hazardous waste and its disposal. Coordination should include the relevant federal authorities, including the customs authorities, from the Governments of Serbia and Montenegro and local authorities responsible for waste movement on their*

respective territories. (see also recommendations 4.4 and 10.3)

The coordination mechanism should be complemented with training programmes for customs officials and inspectors on how to control hazardous waste shipments and management operations, including recycling, so as to meet Basel Convention obligations. In this regard a user-friendly technical handbook or guidelines on how to determine what constitutes hazardous waste for the use of customs officials and inspectors could be drafted.

Recommendations to Serbia and to Montenegro

The availability of data on waste is generally limited, and data are fragmented. Data are based on estimates only, since there are no precise figures on waste disposal, nor is there any adequate reporting system in place.

Reliable data on the amounts and types of waste being generated are a necessary prerequisite for the development of an integrated waste management strategy and a waste policy.

Recommendation 7.3:
***Serbia**'s Ministry for Protection of Natural Resources and Environment and **Montenegro**'s Ministry of Environmental Protection and Physical Planning should each prepare inventories of industrial (including hazardous) waste generation. The inventories should include:*

- *The main sectors generating industrial (including hazardous) waste and the number of installations per sector;*
- *The kinds of waste being generated;*
- *The production processes producing the waste; and*
- *The location where waste is being stored and discharged.*

Currently there is no comprehensive strategy for waste management in either Serbia or Montenegro, but a strategy is under development in Serbia. Some of the greatest challenges facing the development of integrated strategies are the financing of waste management, communication between industrial waste generators and the authorities, and coordination with other public management sectors (physical planning, water protection, industry, tourism, health, agriculture). The local coordination of waste-related activities, including the preparation of local waste management plans, also presents a challenge.

The strategy should address how best to minimize the generation of waste, including municipal waste, at the source. The development of inter-municipal partnerships for waste management, in particular for the construction and operation of new sanitary landfills, may be considered. In this regard attention should be paid to how local authorities could establish collection and disposal fees in order to take into account both operating and investments costs, and encourage the minimization of waste and waste recycling.

Recommendation 7.4:
***Serbia**'s Ministry for Protection of Natural Resources and Environmental Protection and **Montenegro**'s Ministry of Environmental Protection and Physical Planning should:*

(a) *Draw up a comprehensive waste management strategy for industrial waste, municipal waste and hazardous waste, paying special attention to hazardous industrial waste;*

(b) *Develop an implementation plan, on the basis of the waste management strategy, that would include, inter alia, legal and economic priorities, measures and targets to ensure that goals are met.*

As preparatory steps for the development of the implementation plans, the respective Ministries should each prepare a study of the waste recycling industry.

Serbia and Montenegro do not yet have a specific law on waste management, but legislation is being developed in Serbia. Existing legislation on waste management is fragmented and does not cover everything. Hazardous waste appears to be regulated through instruments governing hazardous substances rather than through specific and comprehensive waste legislation. Furthermore, current legislation on waste management does not seem to have been fully implemented or to reflect recent changes in the waste situation. Nor does it clearly allocate responsibilities and tasks to those responsible for waste management.

Recommendation 7.5:
***Serbia**'s Ministry for Protection of Natural Resources and Environment and **Montenegro**'s Ministry of Environmental Protection and Physical Planning should develop and implement a law on*

waste management. The law should as far as possible take into account relevant EU waste legislation. It should:

- *Define and classify all waste, including hazardous waste;*
- *Lay down clearly the responsibilities for waste management;*
- *Provide for regulatory instruments for local authorities and procedural mechanisms to ensure proper implementation, including permitting requirements; and*
- *Specify institutional arrangements for its enforcement.*

The successful implementation of a strategy to minimize the generation of waste, including municipal waste, at the source requires the participation of the public at large. Experience shows that this is unlikely to be obtained quickly. A public information campaign and long-term education programmes should precede more practical measures, like the separate collection of different waste materials.

Recommendation 7.6:
***Serbia**'s Ministry for Protection of Natural Resources and Environment and **Montenegro**'s Ministry of Environmental Protection and Physical Planning should launch a wide information campaign addressing businesses, institutions and members of the public to promote the minimization of waste at the source. It should be complemented by educational and training programmes to prepare the separate collection of municipal waste. Communication media, such as television, radio and newspapers, should be used to the fullest extent.*

Almost all municipal waste is dumped at municipal disposal sites, which are numerous (150 in Serbia and 21 in Montenegro). There is almost one disposal site per municipality. Almost all of them lack environmental safety features and standards. They do not have any insulating plastic lining to protect groundwater against the leaching of hazardous substances. Virtually none of the landfills has a drainage system, and existing equipment is obsolete.

Recommendation 7.7:
***Serbia**'s Ministry for Protection of Natural Resources and Environment and **Montenegro**'s Ministry of Environmental Protection and Physical Planning should, in cooperation with selected municipalities, prepare a study for the rehabilitation of landfills. On the basis of the results of this study, they should initiate demonstration projects for the construction of new sanitary landfills.*

Current management practices for hazardous medical waste are inadequate and are a severe health risk for the general public. At present this waste is not separated from municipal waste and is dumped in sites without any separation or treatment. A separate system for the management of hazardous medical waste should be introduced, covering all aspects from the point of origin to final disposal. (see recommendation 15.5)

Recommendations to Montenegro

An aluminium plant outside Podgorica is seriously polluting the area, mainly with red mud, the residue of cathode production. There are also about 70 tons of PCBs, as well as phenols, and waste containing mercury, fluorides, polyaromatic hydrocarbons (PAHs), fluorine gases, and dust from coke. About 3.5 million tons of red mud is stored at the first landfill (basin), which occupies an area of 170,000 m^2. Of the two basins used at the landfill, only one has an insulation layer to protect against seepage of heavy metals into groundwater. Urgent measures are needed to stop further contamination.

Recommendation 7.8:
The Ministry of Industry and Energy, together with the Municipality of Podgorica and in consultation with the Ministry of Environmental Protection and Physical Planning, should undertake a financial viability study of the aluminium plant. If the plant is found to be viable, it is important to begin immediately to modernize its technologies, introducing purification equipment and constructing a new landfill for red mud according to EU standards and norms.

There are about 3.5 million tons of toxic tailings at Mojkovac (Jaloviste site). The Tara River is protected by an earth-gravel dam, reinforced by concrete slabs, but the dam is in a very bad condition. Water from the sites has a pH of 12 and is contaminated by heavy metals and toxic substances and pesticides. This site poses a serious threat to the population and the environment, especially in the event of an accident (flood and earthquake) or heavy rainfall. There is the risk of a total collapse of the dam that could contaminate the vicinity of Mojkovac town and the Tara River. (see recommendation 8.7)

Chapter 8

MINERAL RESOURCES MANAGEMENT

8.1 Yugoslavia

The Federal Department of Geology of the Ministry of the Economy and Internal Trade is, among other things, responsible for land surveys and for presenting them on charts and maps, along with an assessment of the economic system, development and transition, and statistics on mineral exploration and exploitation. The Federal Institute of Statistics publishes valuable information in bulletins and yearbooks. The Federal Customs Management Service supervises the export and import of minerals.

Decisions on the management of mineral resources are mostly taken by the constituent republics and the municipalities.

8.2 Serbia

State of mineral resources and their exploitation

Mineral potential

Serbia has many mineral deposits and major occurrences (Fig. 8.1), distributed throughout several regional metallogenic units. Copper ore deposits in Serbia occur as porphyry copper and massive sulphide types, located predominantly in the east Serbian sector of the Carpatho-Balkanides (i.e. Bor metallogenic zone). The mineral potential of the Bor metallogenic zone is estimated at 8 million tons of copper and 350 tons of gold in porphyry copper-type mineralization and 1.5 million tons of copper and about 100 tons of gold in massive sulphide-type mineralization. Apart from significant concentrations of gold in the Bor metallogenic zone, other potential areas for gold have been found in Serbia, such as the volcanic complex of Lece, where gold is associated with hydrothermal vein-type lead-zinc-copper deposits and several prospective areas with volcanic hosted gold mineralization. The most significant area in Serbia for lead-zinc ore is the Kopaonik metallogenic district. Mineral deposits are of skarn, volcanic replacement and vein type. Reserves of lead-zinc ore in Serbia are estimated at 45 million tons of ore with 6.3% Pb and Zn or 140 million tons containing 3.0-4.5% Pb and Zn. There are also deposits of lateritic weathering crust on serpentinite and tin in granites.

The main coal deposits, mostly lignite, are located in the Kolubara, Kostolac and Kosovo and Metohija lignite basins. Excluding Kosovo and Metohija's resources, coal reserves are estimated at approximately 16 billion tons, equivalent to more than 55 years of exploitation at the current level. This lignite is characterized by a low calorific value. Serbia's oil and gas reserves are modest compared to those of other regional producer countries. Serbia has produced natural gas since 1952 and oil since 1956, but has always been a net importer of both. Since 1996, the production of natural gas has averaged 700 million m^3 per year. Gas is mostly imported from the Russian Federation, via Ukraine and Hungary. Domestic production of oil has declined from 1.02 million tons in 1996 to approximately 815,000 tons in 2001. The most important oil field is Mokrin, in the Kikinda region, which accounts for 60% of all Serbia's production (see also chapter 11, on energy and the environment).

Table 8.1: Trends in oil, gas and coal exploitation in Yugoslavia, 1994-2000

	1994	1995	1996	1997	1998	1999	2000
Oil (thousand tons)	1,078	1,066	1,030	979	896	705	789
Gas (thousand m^3)	824,000	906,000	671,000	688,000	637,000	760,436	761,400
Hard coal (thousand tons)	82	57	63	92	111	49	88
Brown coal (thousand tons)	529	560	539	512	390	413	398
Lignite (thousand tons)	37,748	39,939	37,828	42,313	43,500	30,967	31,936

Source: Federal Ministry of the Economy and Internal Trade. Department of Geology. 2001.

Table 8.2: Trends in the exploitation of non-metallic raw materials in Yugoslavia, 1994-1999

thousand tons

	1994	1995	1996	1997	1998	1999
Magnesite	68	75	89	98	81	33
Asbestos	22	21	18	14	19	10
Kaolin	31	..	..	50	..	..
Ceramic clays	34	21	43	51	46	26
Sands	403	307	362	366	353	253
Salts	32	14	22	28	27	..
Construction materials	12	12	15	15	16	17

Source: Federal Ministry of the Economy and Internal Trade. Department of Geology. 2000

Serbia is relatively rich in silica raw material, with the mineral potential of quartz sands exceeding 3 billion tons. Recently, a hydrothermal-sedimentary boron deposit was discovered in a Neogene basin in Serbia. Occurrences of boron minerals have also been found in other Neogene basins, such as Valjevo, Vranje, Nis and Leskovac. Amorphous magnesite raw material is concentrated in numerous vein and stockwork-type deposits in serpentinites and in sedimentary deposits in Neogene basins, with both mineable reserves and mineral potential estimated at 40 million tons. In addition, significant reserves of other mineral commodities, such as dolomite, zeolite, feldspars, clay raw material, fluorspar, phosphorite, and wollastonite, have been identified in Serbia.

Mining industry

About 150 mines are currently being worked in Serbia. Coal mining is active in large opencast lignite mines located in the Kolubara and Kostolac coal basins. Ninety-five per cent of their production goes to thermal power plants. The Kolubara coal mines, which provide 80% of the coal for thermal power plants, consist of four opencast mines that produce about 26 million tons of coal a year. The Kostolac coal mines are composed of three opencast mines with an annual production of 6 million tons of coal. Brown coal is produced in eight underground mines with an annual output of 600,000 tons. This coal is sold on the free market, mainly as consumer goods. Serbia imported about 160,000 tons of coal in 2001.

As a result of over a decade of low prices and minimal investment, the Serbian coal industry is now in a difficult situation. Prices are less than half the level needed for short-term cost recovery, which is estimated at US$ 6.4/ton. Production costs, including maintenance, depreciation and expropriation, total approximately US$ 11/ton. Coal mines are currently being restructured and privatized, since 99% of them are State-owned units of Electric Power of Serbia (EPS). Similarly, NIS-Naftgas, the oil and gas company, is being restructured for privatization. The company's main strategy for the future, since reserves are limited, consists of diversifying activities, using its experience in the business to provide services worldwide.

Base metal mining is also going on in Serbia. In spite of a great geological potential, base metal mining and processing plants are in a bad situation, owing to inefficient management and the current low prices of metals. Restructuring old plants, like the huge complex RTB Bor (Rudarsko-Topionicarskog Basena), and privatizing them will set a new management style, which is expected to bring significant benefits. Lead and zinc are mined in Rudnik, Lece, Grot, Veliki Majdan and Suva Ruda, which produce about 20 tons of lead concentrate and 27 tons of zinc concentrate a year. Precious and rare metals are recovered as secondary products from base metal processing plants. Some processing waste dumps are richer in rare and precious metals than some primary deposits.

The large number of small-scale open pits and quarries which produce industrial and construction materials represent a significant part of the Serbian mining industry. Most of them are successfully managed, whether they are private or State-owned. Small-scale mining is expected to develop through new investment in the construction materials industry, traffic infrastructure and the chemical industry.

Kosovo and Metohija also has a great potential for lead and zinc, in addition to its large coal reserves. The mining and metallurgical complex of Trepca, the most important industrial hub in Kosovo and Metohija, was seriously damaged in the 1999 war.

This complex is composed of two lead-zinc underground mines, Ajvalija and Kisnica, and two major tailing ponds (Gracanica), together with their smelting facilities.

Environmental pressures on nature

Soil pollution and land degradation, watercourse pollution, and air pollution with gas emissions and dust are the consequences of many years of inefficient environmental management and a lack of investment in cleaner technology.

Copper mining and smelting

The RTB Bor Group is a serious environmental hot spot in Serbia. The main related environmental problems include open-pit waste dumps, flotation tailings, mining and processing waste waters, and air pollution. Bor is also a potential regional risk spot, since the collapse of its tailing dams would release high amounts of toxic materials that could reach the Danube River through the Borska River and other tributaries.

Dust is a major problem for the local communities of Bor, Krivelj and Ostrelj, because the opencast mines are very close to human settlements. The waste dumps are also sources of soil degradation and, due to their high acidity, they require a thick humus covering before recultivation. About 1300 ha of soil have been damaged. A programme of partial rehabilitation was undertaken before 1997. One and a half million trees were planted on 40 ha, with an average success rate of 40%.

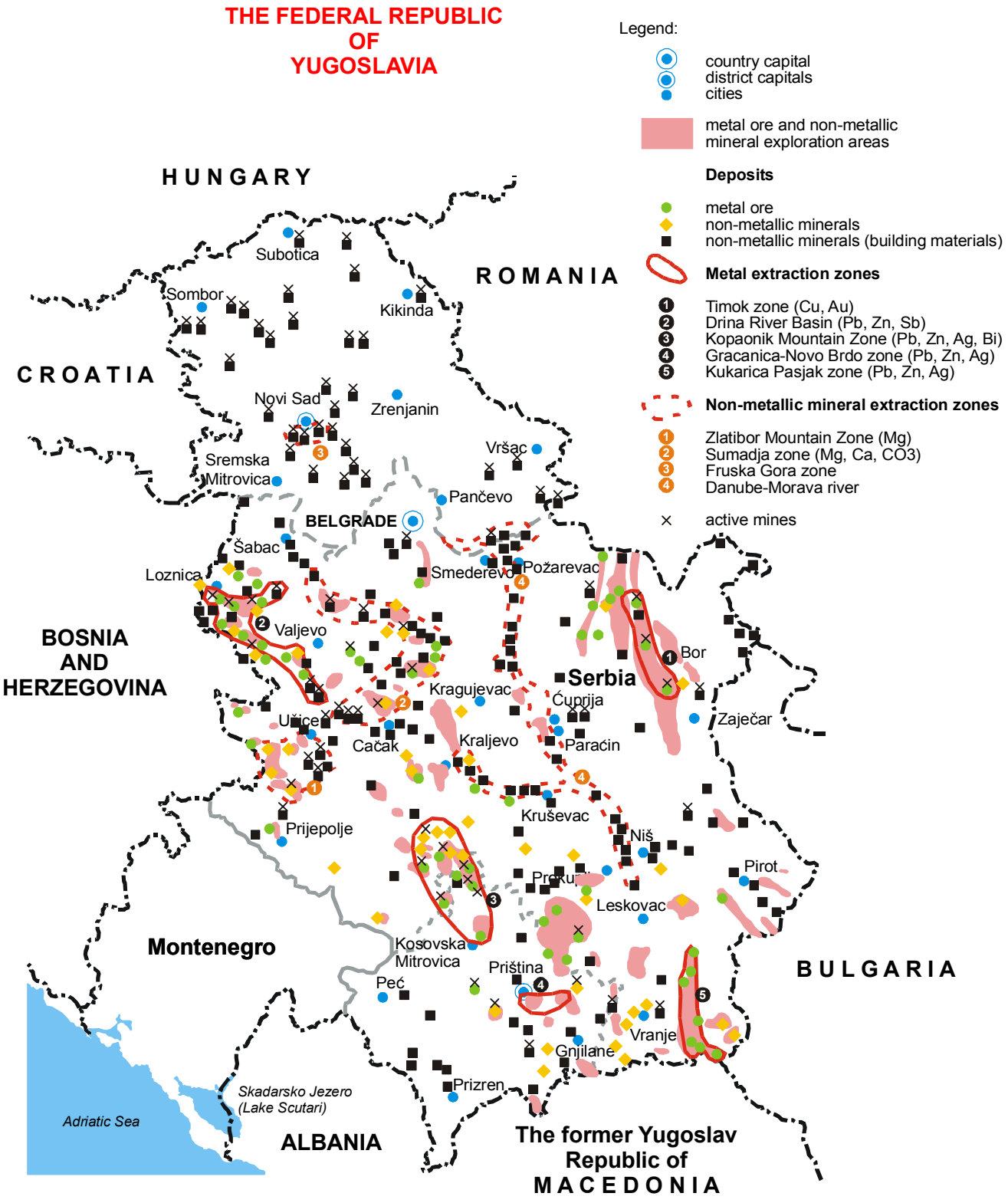
There are two flotation tailing dams at Bor: Bor (RTH) and Velik Krivelj. The RTH tailing dam was constructed in the area of the RTH open pit, and then expanded to a part of the Borska River, which was dammed. The total area occupied by the RTH tailing is 86.4 ha. The Velik Krivelj tailing dam is located in the Kriveljska River valley, and has been created by deviating the river (tunnel and collector) and by damming the river downstream and upstream. Two symmetric flotation tailing ponds were constructed, with volumes of 94.3 million m^3 and 89.4 million m^3, respectively.

Most of the negative environmental impacts of these tailing dams include surface degradation due to changes to the original topography and damage to fertile soils, the pollution of water, air and soil with heavy metals, and high dust concentrations in the air. Moreover, ground and surface waters in the vicinity of the tailing pond may be contaminated by heavy metals such as lead, zinc, copper and arsenic, which have already been found in soil and plants in the Bor region. In the event of a tailing dam failure, about 60% of the toxic material would leak in a fluid state directly to the Borska River, and onwards to the Danube River, with enormous environmental consequences for the entire region. The Velik Krivelj tailing pond represents a serious accident risk spot, due to the possibility of the Kriveljska River collector breaking. If the damage to the collector is not repaired, the dams (IA, IIA and IIIA) may burst, causing severe environmental damage.

Due to technological failures in the closed-water system, waste waters from mining and processing are discharged into the Borska and Kriveljska Rivers. Discharged mining waters have a high content of suspended substances, such as copper and other heavy metals, and a low pH value. Similarly, metallurgical waters formed in the sulphuric acid plant and tank house are acid and contain harmful elements (Cu, As, Pb, Zn). These waste waters are released untreated into a reception lake and further to the Borska, Timok and Danube Rivers. About 300-500 tons of sulphuric acid, 300-350 tons of As, 30-100 tons of Pb and 10-35 tons of Zn are released annually from the RTB Bor operations.

The main sources of air pollution in Bor are the copper smelter, the sulphuric acid plant, the thermal power plant, and the copper and copper alloy foundry. Due to very low SO_2 recovery (20-30%) during the smelting process, large amounts of this gas, about 170,000 to 250,000 tons per year, are released into the atmosphere. The recovery of SO_2 could be increased to over 90% if a better smelting technology, such as “flash smelting”, were in place. Emissions of dust can reach 1300 tons per year, and they contain high amounts of heavy metals (e.g. bismuth, lead, zinc, copper, cadmium, manganese and titanium). These emissions are also a source of transboundary pollution, since Bor is near the borders of Bulgaria and Romania.

Figure 8.1: Mineral deposits in Serbia



"The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations".

Source: Ministry for Protection of Natural Resources and Environment, 2002

Box 8.1: Strategic consolidation of the RTB Bor, Serbia

The Bor mining and metallurgical complex (RTB Bor) consists of a core company, with mines and smelter facilities, which has 13,535 employees, and dependent companies for copper processing and precious metals refining from copper ore, with 6,370 workers. Past policies led to costly operations, an unsustainable financial situation and huge debts. Overstaffing and the lack of investment in maintenance also contributed to a decline in production. The situation is aggravated by low copper prices, obsolete equipment and severe environmental damage. Moreover, during the war, the transformer station in the RTB area was destroyed, and pyralen leakage from damaged capacitors is now a threat to the environment. A remediation project has been developed by UNEP.

In order to consolidate production in viable mines and divest most non-core activities, enabling the main part of the company to operate profitably in the near future, a restructuring plan has been developed at the initiative of the Government of Serbia, the Ministry of Mining and Energy, and the RTB managing board. In addition to the production, organizational and financial consolidation of the company, the restructuring plan envisages preparing some parts of RTB Bor for privatization. However, implementation is slow.

Coal, oil and gas industries

Opencast coal mining and its waste dumps and ash deposits from thermal power plants are major sources of air pollution in Serbia. Dust released by coal waste dumps causes environmental and health problems for local populations. The huge size of waste dumps and the low percentage of rehabilitated areas aggravate the problem. In the Kolubara basin, waste from four coal mines occupies an area of 3,481 ha, of which only 36% has been recultivated. In Kostolac, waste from three mines is deposited over a total surface of 1,479 ha, of which 34% has been rehabilitated. Waste from the Kosovo and Metohija coal mines occupies 1,080 ha, with only 7% of the land reclaimed.

Ash is accumulated in ponds and exposed to wind erosion and transport, polluting the atmosphere. The total area occupied by these deposits is 1583 ha, including in Kosovo and Metohija. In the year 2001, about 48,140 tons of ash was produced from thermal power plant operations using mostly lignite. Electrostatic precipitators are used to remove ash particles from flue gases; however, these devices are old and obsolete. According to Electric Power of Serbia (EPS), in 2001 its four thermal power plants (Kolubara, Kostolac, Morava, and Kosovo and Metohija) generated about 287,000 tons of SO_2 and 55,380 tons of NO_2.

In addition, waste water from thermal power plants is discharged without treatment into the local river systems. The situation is particularly serious at the Obrenovac thermal power plant in the Kolubara basin, whose waste-water discharges go directly into the Sava River, the drinking water source for the city of Belgrade. The ash deposit at Obrenovac also extends over 1000 ha of land, requiring urgent reclamation.

The main environmental issue for the oil and gas industry involves the mud used for drilling during both exploration and exploitation. The use and disposal of vast amounts of mud containing toxic elements such as Cr, which is very harmful to human health and the environment, pose a major problem. Adequate disposal sites are required for about 15,000 to 20,000 m^3 of mud. A modern technique that can help avoid this problem is the "dry drill mud" technique. It is, however, very expensive and not used in Serbia. Another problem is the CO_2-rich natural gas deposit containing 35 billion m^3 of CO_2 under the city of Becej. The deposit is currently 400 m deep, but due to rapid CO_2 migration, it will be only 100 m deep in the coming years. Some years ago, an accidental explosion occurred on the site, but was controlled. Due to the permanent threat of another accidental explosion in this deposit, it is necessary to drill out the CO_2, which is a delicate and high-risk operation. Unfortunately, NIS-Naftgas does not have the technology for drilling in such a situation, and the high cost charged by foreign companies for performing these services prevents NIS-Naftgas from solving the problem.

Policy objectives and management

The policy framework

Since electric power production for the next 50 years will be based on coal, the medium- and short-term strategy in the coal sector is to sustain production levels to ensure the continuous supply of thermal power plants. The main short-term strategy for the mineral industry, including the coal, oil and gas and copper industries, is its complete restructuring. The Serbian Government started economic reforms at the beginning of 2001, including improvements of the financial

infrastructure, mineral legislation and restructuring of the mining industry. The aim of these measures is to provide an appropriate environment to attract foreign investment to the mineral business. The Government also intends to attract more domestic private investors to mining, although the legislation for this has not yet been drafted.

The legislative framework

Another major policy objective in Serbia is to provide a legal framework to attract investment to exploration and mining. An ambitious and comprehensive Law on Privatization was enacted in June 2001, and the transfer of exploitation rights to the foreign partners of cement factories in Serbia has already started, with good results. In addition, the Law on Foreign Investments was enacted at the beginning of 2002 (16 January), the Law on Concessions was completed and will soon go before the National Assembly, and the new draft law on mining has also been finished and is awaiting public review. The previous Law on Mining dates from 1995.

The Law on Concessions and the new draft law on mining respect all modern mining law principles, including compatibility with EIA procedures and the availability of geological data.

In the oil and gas sector, the restructuring of NIS-Naftgas is on the agenda. However, to attract private investors to oil and gas exploration and production, it may be necessary to adopt modern and transparent legislation, such as an oil and gas law and a law on production-sharing contracts.

Economic instruments

The current taxation regime is applied to all sectors of the economy, and is not specific to mining. Tax incentives are available for assets that are used for environmental protection and energy saving, as well as for scientific, research and educational purposes. Other instruments, such as the accelerated amortization and depreciation of equipment, royalty fees and corporate income tax exemptions, are not specifically intended for environmental protection.

The institutional framework

The main body in charge of the management of mineral resources in Serbia is the Ministry of Mining and Energy. Its Division of Geology and Mining has, among other tasks, responsibility for attracting and facilitating both foreign and domestic investment in exploration and mining. The agency for mineral resources, which will be established as soon as financial support is provided, will perform these promotional activities in the future. The Ministry's Division of Oil and Gas is responsible for the introduction and implementation of efficient policies in the oil and gas sectors.

The new Ministry for Protection of Natural Resources and Environment has been given responsibility for the protection and sustainable use of natural resources, including minerals. It will prepare research programmes in fundamental geological investigation and exploration.

In addition, the Institute of Geology and the Geo-Zavod Institute undertake geological exploration paid for by the State budget, and the Department of Environment within the Municipality of Belgrade is in charge of environmental mining issues in the municipal area. The Republican Agency for Privatization and the Ministry of the Economy and Privatization are the main institutions dealing with privatization issues in Serbia, including those related to the mining industry.

Serbia's main State-owned companies are Electric Power of Serbia (EPS), which manages the coal mining sector, NIS-Naftgas, the Serbian oil and gas company, and RTB Bor, a huge complex for copper mining and processing.

Most companies operating in the mineral sector have a monitoring network, but monitoring has been reduced due to budgetary restrictions (see also chapter 3, on information, public participation and awareness-raising).

Information systems

The national centre for information on basic geological research, exploration, mining and mineral policy is the Division of Geology and Mining. This information centre will be transferred to the future independent agency for mineral resources. Last year, the Division of Geology and Mining initiated a short-term project "Computerized Information System for Geological Exploration and Mining". Among other things, this information system will develop a database on basic geological research and digital exploration and will make a mining cadastre available to the public. At present, these data are available only in hard-copy versions, together with copies of maps and reports. There are about 6,000 reports on the

results of all types of geological research on which the Serbian authorities spent about €150 million during a 50-year period.

8.3 Montenegro

State of mineral resources and their exploitation

Mineral potential

Montenegro has significant reserves of bauxite, lead, zinc, coal, ornamental stones, sea salt, gravel, sand and other construction materials. Red bauxite and coal are strategic mineral raw materials in Montenegro. The main reserves of red bauxite are located in the south-west, with about 90 deposits and occurrences in the karsts and 34 million tons of estimated reserves. Lead and zinc deposits and occurrences are mainly located in the regions of Ljubisnje and Bjelasica, with associated gold, silver, copper, bismuth and cadmium.

Coal deposits in Montenegro are mostly lignite and brown coal, with total estimated reserves of 265 million tons. Lignite deposits are located in the Pljevlja region, while brown coal deposits are found in the Berane area. In addition, there are several peat deposits in the Skadarsko Jezero basin. Although oil drilling in the coastal part of Montenegro has been carried out during the past 50 years, no economic deposits have been discovered so far. However, geological research for oil and gas continue to be undertaken in zones considered as potential, such as Budva and Bar. The local company performing these activities is Yugopetrol Kotor.

Ornamental stones, mostly marble and granite, are also of strategic importance for Montenegro's development. About 40 deposits have been registered. Gravel and sand deposits are abundant in the bed of the Moraca River, near Podgorica, in the Lim valley, in the upstream of the Tara River. The Kotor, Zabljak, Ulcinj, Cetinje, Niksic and Budva regions contain significant deposits or occurrences of construction materials. In addition, there are deposits of barite, bentonite, sea salt, dolomite, white bauxite and brick clay in Montenegro.

Mining industry

Two coal mines are currently being exploited in Montenegro: the Pljevlja lignite mine and the Ivangrad brown coal mine. At Pljevlja, there are two open pits, with an annual production of about 1.5 million tons of coal, most of which is supplied to the Pljevlja Thermal Power Plant. Red bauxite is exploited in the mines of Niksic and Cetinje. The Niksic mines include various surface mines and are Montenegro's largest producer of bauxite ore, accounting for more than 600,000 tons of bauxite per year. They supply the aluminium combine in Podgorica (KAP). Lead and zinc used to be exploited in the mines of Suplja Stijena and Braskovo, and there is an active production and processing of ornamental stones, with many mines in operation, including Klikovace, Vinici, Suk, and Krute. Cement raw material is exploited at the surface mines of Potrlica and Jugostica. Quarries for construction materials are abundant. Brick clay, gravel and sand, barite and bentonite are also produced in Montenegro. The only producer of salt in Yugoslavia is the Bajo Sckulic mine in Ulcinj.

Environmental pressures on nature

The main environmental problems of mining in Montenegro are related to the management of tailing deposits and mining waste dumps, which occupy vast surfaces and are sources of air, soil, water and groundwater pollution. Two major environmental hot spots are described here: the Mojkovac tailing pond and the Pljevlja coal mining region.

Tailing management: the Mojkovac case

About 3.5 million tons of toxic mining and processing waste has been accumulated in a tailing pond near Mojkovac (see also chapter 7, on waste) during the 14 years of Pb-Zn mining operations. The tailing pond occupies 20 ha, with an average depth of 12 m, located at an altitude of 807.5 m, and also receives overflow from the municipal sewerage system. Previous reclamation works in the site included the reinforcement of the dam walls with gravel and concrete slabs, and the placing of a bottom liner to protect the Tara River from contamination. The deposit surface was covered with gravel, followed by a layer of humus, and then vegetation was planted.

However, these measures have proven to be insufficient to tackle the chronic negative environmental impact on the air, soil, surface water and groundwater. Moreover, the dam walls failed twice, which would have resulted in a regional ecological catastrophe had they not been repaired on time. Environmental monitoring of the tailing pond is non-existent and, consequently, chemical

analyses at the site are scarce. Recently, the Centre for Ecotoxicological Research of Montenegro carried out some analyses of the air, bottom sediments, mud and waste water at the Mojkovac tailing pond. The results reveal relatively high concentrations of heavy metals, such as Pb, Zn, Fe, Cu, Cd, Hg, As, Mo, Au and Ag, as well as phenols and cyanides. In the southern part of the deposit, 6,092 mg of Pb/kg and 9,250 mg of Zn/kg were measured, and, in the central part, 2,354 mg of Pb/kg and 78 mg of Cd/kg were found.

The mobility of heavy metals could result in severe consequences for human heath, flora and fauna. Fortunately, the predominant alkaline pH of the waste waters (up to 8.35) helps to prevent this, although in some upper parts of the pond (10-20 cm deep) the pH is strongly acid, with values between 2 and 3. In addition, the waste waters have a high sulphate content, are highly radioactive and even contain pesticides (DDT, heptachlor). The state of groundwater cannot be assessed due to the lack of monitoring. However, water sinking into the underground is now controlled by piezometers located in the rim and foundations of the dam. Air analyses at the site indicate high concentrations of SO_2, NO_x and heavy metals, with Cd, Pb and Hg breaching maximum permitted concentrations.

The current situation at Mojkovac needs urgent remediation to ensure the safety of the dam in the event of flooding, erosion or an earthquake. The improvement of environmental conditions, too, is crucial to prevent direct negative impacts on the local population, which is continuously exposed to pollution. Future monitoring of the site for many years after complete rehabilitation will be necessary to control the environmental quality of the area.

The Pljevlja coal mining region

Pljevlja is a traditional mining region in northern Montenegro. Its mineral potential includes deposits of lead-zinc ore, which were mined until the 1990s, barite, clays and carbonates, in addition to significant coal mining. It also has a thermal power plant that produces energy for the Montenegro's entire system. Two opencast coal mines are currently in operation, producing about 2 million tons of lignite per year, of which 1.5 million tons go to the thermal power plant and 500,000 tons to Serbia. Total reserves of coal in Pljevlja are estimated at 170 million tons. The mining company employs 1,800 workers and about 1,760 contractors, and is 30% State-owned and 70% employee-owned.

The active coal mines and the thermal power plant pose important environmental problems for the Pljevlja region. Both facilities are located very close to the town of Pljevlja, directly exposing the population and the environment to the negative effects of chronic pollution. Dust emissions from mine waste dumps, due to their fine particle size and the location, are a major source of air pollution in Pljevlja. In addition, these waste dumps degrade the landscape. Self-combustion of coal piles and the transport of coal to the thermal power plant also contribute to air pollution. Eighty hectares of damaged land has been rehabilitated, and another 100 ha are currently being prepared. The rehabilitation consists of covering the mining waste dumps with a 20 to 60 cm thick layer of humus, followed by land recultivation.

Box 8.2: The Mojkovac lead-zinc tailing pond: a potential environmental risk spot

The Mojkovac lead and zinc mine is located in northern Montenegro, in the vicinity of Mojkovac, a small town on the bank of the Tara River, which is on the UNESCO World Heritage List. The mine started operations in 1976 and went bankrupt in 1990, when its activities ceased. The mine complex was composed of underground mining and processing facilities, using a wet process to obtain lead and zinc. Waste water from the flotation plant containing toxic substances was transported by pipeline to a final disposal pond, located along the right bank of the Tara River. The tailing deposit is estimated to contain about 140,000 tons of lead and zinc ores.

During the autumn of 1992, the northern region of Montenegro was struck by intensive rainfalls, which led to a significant increase in the Tara River flow. The flooding waves caused a severe erosion of the lateral walls of the dam and a partial failure at the dam crest. Fortunately, the tailing deposit remained stable, and some repairs have been carried out. However, this episode illustrates the danger of an accidental discharge of enormous amounts of toxic materials into the Tara River, which would result in serious environmental consequences for the entire region. To address this problem, the Ministry of Environmental Protection and Physical Planning prepared a project under the umbrella of REReP. However, project implementation has been hampered by a lack of funding.

Other significant sources of atmospheric pollution are the harmful emissions from the power plant and dust from ash deposits. Between 1998 and 2001, emissions of toxic substances were generally reduced, though significant amounts of SO_2, H_2S, NH_3 and phenols were detected in the air during this period. The exploited lignite has a high ash content (up to 30%), generating huge amounts of ash during the combustion process. This ash is deposited in a 2.2 km^2 tailing pond. This tailing pond is also a source of water pollution, since large amounts of suspended materials, cyanide, cadmium and oil products were measured at the nearest river system, the Vezisnica River. Waste-water discharges from the thermal power plant, without pretreatment, contain relatively high amounts of suspended solids, nitrates, sulphates, phenols, As, Cu, Zn, Sb, Fe, and oil products, especially from the cooling tower, which are released into the local rivers. Surface water pollution is also found in the Cehotina River, in the vicinity of the coal mine, with significant amounts of phenols, oil products, cyanide, antimony and cadmium. Slightly alkaline pH values around 8 are predominant in local watercourses and waste waters from the power plant, preventing the remobilization of heavy metals. These river systems are part of the Danube River basin, which has a regional strategic importance. It could induce a transboundary effect with Bosnia and Herzegovina, as well as Serbia, through the Drina River.

Policy objectives and management

The policy framework

The main policy objective in the mineral sector is to maintain rational coal production as the primary source of energy supply for industry and households. Electric power from thermal plants is essential to the good functioning of the main industrial facilities in Montenegro, such as the aluminium combine (KAP) and the Niksic ironworks. After economic stabilization, the Government plans to increase coal exploitation to about 3 million tons annually in order to supply a new thermal power plant unit to be built in the future. In the oil and gas sector, the Government also intends to carry out geological research in order to explore new potential areas of exploitation and to identify reserves. To maintain the current levels of bauxite exploitation for the production of aluminium and other derivate products is also an important objective in Montenegro's development strategy.

The legislative framework

Environmental concerns in mining, especially in coal mining, are addressed by the 1996 Law on the Environment. The 1994 Law on Mining, however, does not incorporate some of the important principles for the sustainable use of mineral resources.

The institutional framework

The main institution in charge of the management of mineral resources in Montenegro is the Division of Geology and Mining of the Ministry of Economy and Industry. It is composed of two inspectors and two advisers covering the geology and mining areas, and one Deputy Minister. This body also issues exploration and exploitation permits and checks industry compliance with the law. The Geo-Zavod Institute acts as the national geological surveyor, performing geological exploration and monitoring natural geological processes and groundwater. The Centre for Ecotoxicological Research monitors the environment in mining regions. However, monitoring is performed only sporadically, even in the most sensitive mining areas (see also chapter 3, on information, public participation and awareness-raising).

Information systems

The Geo-Zavod Institute's mining and geological exploration service is responsible for Montenegro's Register of Mineral Deposits and Occurrences, which covers about 260 mineral deposits and occurrences. Some parts of this Register have already been converted into digital format, but the great majority remains on paper. GIS applications, such as ArcInfo, are now beginning to be used for data management.

8.4 Conclusions and recommendations

Recommendations to Serbia and to Montenegro

Investments are necessary to remedy the environmental damage caused by mining, beneficiation waste and tailing dams, mostly in coal and copper mining regions. Since 1992, little has been done to restore these sites. Specific environmental rehabilitation projects have been developed by qualified staff in major mining companies, such as Electric Power of Serbia and RTB Bor, or by foreign consulting companies, but their implementation still requires funding and a

stricter timetable. For example, the land rehabilitation and restitution of 198 ha of stockpiles from the Field D opencast mine (Kolubara basin), estimated to cost US$ 2 million, has not yet been implemented. At RTB Bor, several projects for the environmental remediation of critical areas, such as decreasing harmful gas emissions from the smelter and reducing surface and groundwater pollution by adequate waste-water treatment, need investments of approximately US$ 5.91 and 3.98 million, respectively. At the same time, these projects need to be put into a longer-term, strategic perspective with concrete action plans.

Recommendation 8.1:
***Serbia**'s Ministry of Energy and Mining, in cooperation with its Ministry for Protection of Natural Resources and Environment, and **Montenegro**'s Ministry of Economy and Industry, in cooperation with its Ministry of Environmental Protection and Physical Planning, should develop long-term strategies for their mining industries that take into consideration, among other issues, the rehabilitation of the industries to minimize their negative impact on the environment, the clean-up of existing waste and decontamination of waste water, the maintenance or reconstruction of weak or damaged tailing collectors and dams (e.g. in Bor and in Mojkovac) and the rehabilitation of degraded land. The strategies should also address the need for regular monitoring, data collection and analysis.*

On the basis of these long-term strategies, they should develop short-, medium- and longer-term action plans that would serve as a basis for discussions with multilateral and bilateral partners as well as with investors. (see recommendations 10.2 and 10.8)

Recommendation 8.2:
***Serbia**'s Ministry of Energy and Mining, in cooperation with its Ministry for Protection of Natural Resources and Environment, and **Montenegro**'s Ministry of Economy and Industry, in cooperation with its Ministry of Environmental Protection and Physical Planning, in developing their actions plans, should work closely with the management of the mining and related energy companies to identify sources of financing for the implementation of the companies' environmental rehabilitation. An adequate and reliable timetable should be established for each project, and implementation deadlines respected.*

Recommendations to Serbia

After almost two years of economic transition, the Serbian mineral industry is now starting to recover. The quick reaction of the sector is largely due to the country's geological potential, the presence of a qualified workforce, the availability of fundamental exploration data, modern mining legislation, a favourable infrastructure, and mining tradition. Effective implementation of the Government's policy has attracted both foreign and domestic investment to exploration and mining. The next step is the establishment of the agency for mineral resources, which is of strategic importance for Serbia. However, continued development of the mining sector could be hampered by the lack of a geologic survey, which would centralize all the activities and information related to geologic exploration and the monitoring of geological processes, including groundwaters. Information would then be easily available for decision makers and possible investors. These informational responsibilities as well as geological research should be separated from the regulatory functions assumed by the Ministry of Mining and Energy.

Recommendation 8.3:
The Ministry for Protection of Natural Resources and Environment should ensure that the Geological Survey collects data for the sustainable management of resources. Its main functions should be: (a) to conduct mineral studies and to identify new hydrocarbon basins, (b) to identify appropriate sites for investment, (c) to conduct seismic and risk assessments of hazardous geological processes, and (d) to produce geo-scientific databases, maps and reports.

The decline of the mining sector during the past decade is mainly due to poor maintenance and a lack of investment in technology. The 1999 bombing also adversely affected the technical capabilities of Electric Power of Serbia, NIS-Naftgas and RTB Bor. Under these conditions, the performance and efficiency of the mines fell, and there was no environmental management of mineral resources.

Recommendation 8.4:
The Ministry of Energy and Mining should introduce best available technologies to reduce substantially any environmental pollution from coal, oil and gas exploration and exploitation and copper mining and smelting. This should be done in

parallel to the introduction of environmental management and international environmental standards in the Serbian mining industry. (see also recommendation 10.3a)

Recommendations to Montenegro

During the past ten years, State-owned mining companies have been poorly managed, exploiting mineral reserves with symbolic exploration expenditure. This has resulted in inefficient exploration and the current scarcity of qualitative mineral reserves. Like Serbia, Montenegro has an advantage over many other countries in transition: domestic geologists, mining engineers and contractors have invaluable experience in designing and working with mostly western-oriented methodology and equipment. However, these professionals lack training in more recent environmental practices and management. In addition, Montenegro's legal framework for minerals is old and needs to be updated according to international mining principles to promote better practices and attract investment. For example, the current Law on Mining (1994) requires mining closure plans to include rehabilitation of the land, but it does not specify any economic mechanism the company could use to obtain the necessary funds for this purpose.

Recommendation 8.5:
The Ministry of Economy and Industry should:

(a) *Review the 1994 Law on Mining in order to establish an up-to-date legal framework, harmonized with EU regulations, that takes full consideration of environmental impacts;*

(b) *Introduce a bank guarantee or similar system as a requirement for issuing exploitation permits, and define rules for self-monitoring; and*

(c) *In cooperation with the Ministry of Environmental Protection and Physical Planning, support the environmental management training of professionals working with environmental issues in mining.*

The development of modern data management in mineral exploration and exploitation is important. Reliable information promptly available to the public and decision makers constitutes a powerful tool for the promotion of a sustainable and efficient management of Montenegro's mineral resources. However, the Geological Survey, which is responsible for managing the national database on mineral resources, lacks the necessary computer and other important analytical equipment, such as inductively coupled plasma-mass spectrometry (ICP-MS), X-Ray fluorescence, and atomic absorption.

Recommendation 8.6:
*The **Government of Montenegro** should increase its financial support to the Geological Survey. Modern analytical devices and computers are necessary to ensure reliable and timely data and to increase opportunities for the sustainable management of the environment.*

Reconstruction efforts have begun rapidly, and particular importance has been given to environmental management and protection. In Montenegro, the Mojkovac tailing deposit needs urgent and long-term remediation. Its final restoration is urgent, since it threatens to pollute the Tara River at the Durmitor national park, which is a UNESCO natural world heritage site.

Recommendation 8.7:
(a) *The Ministry of Environmental Protection and Physical Planning, the Ministry of Industry and Energy and the Municipality of Mojkovac should immediately start rehabilitation activities at the Mojkovac tailing deposit in order to protect the Tara River and the vicinity from contamination by toxic sludge.*

(b) *The **Government of Montenegro** should earmark adequate funds for the rapid implementation of the project, starting with an environmental impact study of the project.*

Chapter 9

BIODIVERSITY CONSERVATION AND NATURE PROTECTION

9.1 Introduction

International obligations on nature protection are entered into at federal level. Among the conventions on the environment (including nature protection) to which Yugoslavia is a Party (see annex III), the most important ones on biodiversity conservation, particularly for countries hoping to join the European Union, are:

- The Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat (1971), which it ratified in 1977;
- The Convention on Biological Diversity (1992), which it ratified in 2002; and
- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (1979) (CITES), which it ratified in 2002.

Conventions are implemented by the constituent republics (Serbia and Montenegro) (except for CITES, which is implemented at federal level). It is important for Yugoslavia to become a Party to the Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979) and the Bonn Convention on Conservation of Migratory Species of Wild Animals (1979), if it is to strengthen its nature conservation instruments, and particularly its protected area systems. Considering its high risk of soil erosion (and other types of soil degradation), Yugoslavia plans to ratify the United Nations Convention to Combat Desertification (1994) shortly. The Federal Secretariat for Labour, Health and Social Care is the focal point for the Convention.

Both Serbia and Montenegro have established environmental ministries that are responsible for nature conservation. Serbia transferred forest protection to its new Ministry for Protection of Natural Resources and Environment, thus being among the first in Europe to give such prominence to ecological forest functions. Montenegro, besides establishing the Ministry of Environmental Protection and Physical Planning in 1991, declared itself an Ecological State in article 1 of the Constitution (1994), followed by the Law on the Environment (1996), which includes, among its 12 general principles, the conservation of natural resources and the preservation of biological diversity.

In spite of these efforts, however, transition problems and almost ten years of isolation have caused Yugoslavia to lag behind other EU applicant countries, particularly in the implementation of international conventions and programmes. Inadequate nature protection financing has also been an obstacle to the acquisition of up-to-date information on species and ecosystems, thus preventing the further development of good biodiversity management practices.

9.2 Yugoslavia

The Environment Department of the Federal Secretariat for Labour, Health and Social Care is responsible for environmental protection, including the pollution of air, water and sea; food safety; the protection of citizens' health in polluted or contaminated areas; drug regulations, and toxic and other hazardous substances. In biodiversity conservation, the Environment Department is Yugoslavia's authority for CITES management and is responsible for issuing permits for the trade in, and the export, import and transit of endangered species. It is also the focal point for the Convention on Biological Diversity and the Ramsar Convention.

The Federal Sanitary, Veterinary and Phyto-Sanitary Inspectorate (previously a part of the former Federal Ministry of Agriculture) is the inspection service responsible for protecting people's health against diseases caused by pollutants; for medicines, poisonous and other hazardous substances; environmental protection (including water and sea); food quality; the health quality of products crossing the borders; veterinary

medicines and substances; plant protection substances and fertilizers; animal and plant exports and imports; and dairy and meat-processing factories and their registration. This is especially important for the controlled use of plant and animal protection substances that are used in agriculture and forestry and that might affect natural ecosystems.

The Federal Bureau of Genetic Resources of Flora and Fauna is engaged in expert activities for the collection, preparation and conservation of plant genetic resources, genetically modified organisms and products that are made of these organisms; seed quality standards, and the issue of seed quality and other planting material export certificates.

The Federal Ministry of the Economy and Internal Trade is responsible for forest protection against diseases and pests, forest seed and seedling quality control at the State border, and cooperation with international forestry organizations. The Ministry is also the national focal centre for monitoring the effects of air pollution on forests.

In addition to the 1992 Constitution and the 1993 Resolution on Environmental Policy, federal laws related to nature protection and forestry are the Federal Law on the Basic Principles of Environmental Protection (1998), comprising, inter alia, criteria and measures of federal competence for endangered species (i.e. the basis for CITES implementation), the Resolution on biodiversity protection policy (1994), the Federal Law on the Admission of Agricultural and Forest Plant Species (1998), the Federal Law on the Protection of Agricultural and Forest Plant Species (2000), and the Federal Law on Genetically Modified Organisms (GMOs) (2001).

9.3 Serbia

The central longitudinal valleys of the rivers Tisa and Morava, and transversal ones determined by the rivers Danube and Sava, as well as western Morava and Nisava, are the country's main axes. There are five main geographical regions: (1) the Vojvodina lowland in the north, characterized by loess (accumulation of clay and silt particles deposited by the wind) and alluvial plains and terraces; (2) the central (hilly) region; (3) the peri-Pannonian eastern part; (4) the Upper Morava region; and (5) Kosovo and Metohija. The climate varies from continental in lowland regions to mountainous and alpine in the rest of the country. Each of these regions has its own ecosystem, including steppes, wetland habitats, mountain grasslands, and forests, bringing a rich diversity of flora and fauna species to Serbia.

Biotopes and ecosystems

Steppes occupy loess terraces in the Pannonian plain. Their surface area has decreased mainly due to conversion into arable land. Wetland habitats can be found along the rivers, mainly the Sava and the Danube. They are very important for waterfowl and other fauna preservation, as well as for wetland forest conservation. Mountain grasslands are spread among the forests at lower altitudes, and above the forest zone on higher mountains. Local communities use them extensively for cattle breeding. If not controlled, overgrazing can lead to soil erosion.

Forests occupy about one third of the country and include the following:

- Pannonian flood plain forests, typical for Vojvodina, which consist mainly of willow, poplar, pedunculate oak and ash tree species. Water is the main factor in their evolution. During recent decades, wetlands were often cut off from the main water sources either because of the construction of flood prevention dykes or because they were drained for agricultural purposes;
- Oak forests (in other parts of Serbia), which consist of eight oak species. The most common are bay oak with ash in the Morava Valley and Sessile oak with other tree species in other parts of Serbia;
- Beech forests (the Serbian-Bulgarian type), which can be found in the hilly and mountainous parts of the country, above the oak forest zone. They are predominant in Serbia, occupying about half of the forest area;
- Spruce forests, which are widespread in western Serbia (particularly on the Golija, Kopaonik, Stara planina and Zlatibor mountains); and
- Pine forests (*Pinetum mugi*), which form the highest sub-alpine belt of forest vegetation with a purely ecological function (primarily protecting soil).

Table 9.1: Forest area and density, 1979

	Total (000 ha)	Forest area			Forest density %
		000 ha	% of Yugoslavia total	hectares/ inhabitant	
Serbia total	8,836	2,313	76.5	0.3	26.7
Central	5,597	1,781	58.9	0.3	31.8
Vojvodina	2,151	103	3.4	0.1	4.8
Kosovo and Metohija	1,088	429	14.2	0.3	39.4

Source: Yugoslav survey, No. 3, 2000.

State of biodiversity

A flora inventory has been completed and is contained in the Red Book (vol. 1), which is harmonized with the latest World Conservation Union (IUCN) criteria, by using the international CORINE methodology and geographical information system technology. There are 3665 identified taxa, of which 350-400 have so far been assessed as endangered, and about 200 at low risk. Categorization should be completed soon.

The Red Book of fauna (vol. 2) has not been completed due to a lack of financing. The *Vertebrata* inventory will soon be finished, but other faunal taxa still need to be inventoried and categorized. Of particular global interest, as species at the top of the food chain, are large *carnivores* (bear, wolf and lynx) that are abundant in the mountains.

According to various reports, migratory and indigenous birds, among other species, have been intensively poached and smuggled in recent years. Efficient and effective inspection and implementation of CITES are particularly important. The Environment Department of the Federal Secretariat for Labour, Health and Social Care is establishing the CITES procedure, in cooperation with Serbia's and Montenegro's environment, interior and customs ministries and authorities.

The two main forest management types in Serbia are intensive management of even-aged stands and plantations (in ordered rotations) in Vojvodina and other lowlands, and combined management of selection hill and mountain forests, with a high share of protective functions.

The two types derive from different ecological conditions, traditional forest practices and the attitudes of local communities. Despite being the smallest area, the lowland forests generate the highest income due to high oak wood prices and good management practices (see table 9.3).

Protected areas

In general, protected area management is dominated by forestry and lacks park services, such as a visitor system, landscape management and community services. Park staff do not include biologists or environmental experts, and the interest of local communities in park management is not included in current protection programmes.

Djerdap National Park is situated in the northeast and borders Romania. It is characterized by the Danube canyon and the huge Djerdap crag. Vegetation consists of about 60 forest and shrub communities that provide habitats for many bird species, particularly waterfowl, as well as for other animals (such as bear, fox, deer).

Fruska Gora National Park is a 539 m high mountain in northern Serbia, with 90% of it forested. About 1100 plant species have been identified, 12% of which are relict or endemic. In addition to 200 bird species, wildcat, badger, marten, dormouse, bat and other species can be found.

Kopaonik National Park is situated in the central part of Serbia, on the highest parts of Mount Kopaonik. Due to altitude and climate zone differences, the area is characterized by a rich biodiversity, especially of endemic and rare species. Beside biodiversity, its main feature is a very attractive landscape.

Mount Shara National Park is in the very south of Serbia, where 20 endemic species are to be found. Beside diverse vegetation, many animals live there, among them lynx, bear, eagle and the griffon vulture.

Table 9.2: National parks of Serbia

National parks	Municipalities	Area (ha)	Altitude (m)
Djerdap	Golubac, Kladovo and Majdanpek	64,000	70-806
Tara	Bajina Bašta	19,200	1 000-1 591
Kopaonik	Raška and Brus	12,000	640-2 017
Fruška gora	Bačka Palanka, Beočin, Indjija, Irig, Novi Sad, Sremska Mitrovica and Šid	25,400	100-539
Mount Šara	Kačanik, Uroševac, Suva Reka, Prizred and Štrpce	39,000	1 220-2 585

Source: Federal Statistical Office. The Statistical Yearbook of Yugoslavia, 2001.

Table 9.3: Wood volume, 1979

in m^3/ha

Type of stand	Serbia			
	Central	Vojvodina	Kosovo	Total
Total average	**106.6**	**70.8**	**143.2**	**101.6**
Total pure stands	106.3	72.9	123.8	100.7
Broadleaved	107.3	69.5	127.2	100.7
Conifers	95.9	154.5	47.0	100.9
Total mixed stand	107.1	67.1	159.4	103.3
Broadleaved	92.4	45.5	164.9	89.2
Conifers	145.2	210.1	54.0	167.4
Broadleaved / Conifers	213.7	205.8	68.5	209.0

Source: Federal Statistical Office. The Statistical Yearbook of Yugoslavia, 2001.

Tara National Park comprises a mountain chain intersected by river valleys and crags. Its peculiarity is endemic and relict spruce (*Picea omorica*). Forests, pastures, peat sites and riverbank vegetation serve as habitats to many animal species and are the main features of the attractive landscape.

Ludasko jezero is internationally recognized as a Ramsar site. There are also two other sites that meet Ramsar criteria: Obedska Bara, and Bara Zasavica (candidate sites).

Threats to biodiversity

Agricultural land occupies about 65% of the total territory, which was originally covered with forests, shrubs, steppe vegetation and marshes. The original vegetation was removed to obtain areas for either mountain pastures or lowland arable land. Marshes were drained and steppes were irrigated for agricultural crops. These activities have significantly decreased, but the remaining natural vegetation is still endangered by overgrazing by livestock, especially in the mountains.

The degradation and loss of forest cover have increased in the past decade, due to illegal forest cutting, uncontrolled livestock grazing and forest fires. Current forest management does not ensure proper silvicultural treatment, and therefore forest quality and health are declining (the low standing volume per hectare is one of the indicators: 101 m^3/ha). The intensity of forest cut is unevenly distributed due to lower transport costs, accessible forests have been overused, and inaccessible forests are not maintained. At the same time the afforestation rate has decreased by 12% a year because of poor financing.

The construction of river dams destroyed some valuable valley ecosystems (i.e. Drina, Piva, Djerdap) and their biodiversity, not only because of the new artificial ponds that have developed quite different ecosystems, but also because the dams interrupted species migration, causing changes in natural species composition, both downstream and upstream (no fish corridors were constructed). Dyke systems that were constructed to prevent floods changed the water regimes and also caused a loss of wetland communities.

Due to economic problems, illegal hunting and fishing have increased in recent years, serving either as the source of food or of income. The illegal export of birds in particular has increased. It

is expected that thorough CITES implementation will help to reverse these negative trends. Due to lack of monitoring, there are no exact data on the state of the affected populations.

Policy objectives and management

The policy framework

There are no overall strategic documents on biodiversity management or nature conservation policy.

Each national park is managed according to annual and five-year protection programmes that are developed by the Institute for the Protection of Nature of Serbia, scientific institutions and experts. The programmes are approved by the Ministry for Protection of Natural Resources and Environment.

Serbia's current spatial plan provides some guidelines for natural heritage protection, including: (1) the enlargement of current protected areas from 5% to 10% by 2010; (2) the development of protection regimes for protected areas; (3) regional priority areas for protection; and (4) new Ramsar sites.

The legislative framework

The Law on Environmental Protection (1991/1995) regulates, among other environmental issues, "the protection of … soil, forests and natural goods…." It forbids disturbing and killing wild animals and damaging vegetation. Article 38 establishes the licensing system for the collection and use of plant and animal species. There are provisions on protected area categories, protection regimes, inspection, financing and penalties for violating the Law.

The Law on the Planning and Organization of Space and Settlements (1995) has provisions on current and planned protected areas. Their spatial distribution and use are mandatory components of physical plans.

The Law on National Parks (1993/1994) defines national parks according to their ecological and geographical characteristics, and regulates their protection, development, inspection and management.

The Law on the Protection on Forests (1991/1996) regulates forest inventory and management, the rights and obligations of forest owners, wood sale, forest inspection and penalties for illegal activities in forests.

The Law on Hunting (1993) regulates hunting periods seasonally according to the game species, the obligations of hunters in terms of animal welfare, and hunting grounds management.

The Law on Expropriation (1995) covers also forests within land that may be expropriated.

Overall, biodiversity and nature protection legislation is segmented into several regulations and does not provide an adequate basis for unified and efficient biodiversity management and control. For example, each of the following topics has its special regulation (mostly ordinance): the control of wildlife use and trade, the nature protection register, the marking of protected areas (information tables, entrance, boundaries), natural monument protection, and rare species protection.

Existing legislation is not harmonized with international standards on biodiversity management. This is particularly the case as far as involving local communities and establishing intersectoral relationships in protected area management are concerned.

Economic instruments

Budgetary financing of protected area management is far too low. It covers only the monthly salaries of protected area management staff. Most income is obtained from issuing fishing licences and licences for the collection of medicinal plants, mushrooms and other species. About 10% of this income is paid to the budget; the rest goes to the public institution that manages the area. The Institute for the Protection of Nature of Serbia determines the prices and quotas of the above-mentioned goods and services.

The institutional framework

According to the Law on Environmental Protection, the Ministry for Protection of Natural Resources and Environment is responsible for protected areas.

It has a department responsible for species and habitat protection and the protected area system, and a department for environmental inspection. The Environmental Inspection Department employs 40 inspectors in seven districts: Belgrade, Novi Sad, Sabac, Uzice, Kragujevac, Nis and Pristina. Its responsibilities include protected areas (in addition

to noise, harmful substances and waste management). The inspectors who were interviewed reported that:

- protected species are insufficiently controlled because the inspectorate lacks staff, vehicles and other equipment;
- competence is unclear between market inspectors (who are allowed to confiscate illegally used equipment and goods from those caught violating the law) and other inspectors;
- inspection methods are not unified (it is up to the environment inspectors to call the local police or market inspectors for help); and
- fines for violating the provisions on species protection are too low. Also, the whole procedure is too long and slow. According to the Law on general administrative procedures, the person who is fined can appeal to the Government. The decision of the Government may be followed by administrative litigation that can take years.

The National Assembly establishes national parks. The Government proclaims nature reserves and other protected areas of national importance. Local authorities (municipalities) may decide on protected areas of local importance. The Institute for the Protection of Nature prepares the documents necessary for the establishment of protected areas.

According to the same Law, each national park is managed by a public institution established by the Serbian Government, based on a proposal of the Institute. Each public institution has its own management board, supervisory board and director. The number of staff and their professional background differ among national parks according to the latter's size and ecological characteristics.

Other categories (e.g. nature parks, nature reserves) are managed by State enterprises (such as the Srbija sume Forest State Enterprise and the water management enterprise). The Law also allows non-governmental organizations to manage natural monuments, but this has not been put into practice yet.

The Forestry and Hunting Directorate of the Ministry for Protection of Natural Resources and Environment is responsible for forestry policy. It has two departments. The Inspection Department controls forest and plant protection, hunting, and the application of the Law on the Protection of Forests. There are 80 inspectors covering 28 districts and the City of Belgrade. This number is not sufficient. It was suggested that at least an additional 30 inspectors were needed to fully ensure the necessary control.

The Forest Analyses Department is responsible for the implementation of forest policy. It approves forest management plans that are developed by the Forest Bureaux, Srbija sume, and private experts. Other forestry expertise is entrusted to the Forestry Institute and the Poplar Institute, but they are not included in the development of the forest management plans.

The Forestry Institute conducts basic, applied and developmental studies, with a recent emphasis on fundamental research. The Institute is also involved in scientific research and engineering in horticulture, wildlife management, erosion control, forest use and wood processing.

The Poplar Research Institute focuses on research into five tree species: poplar (*Populus*), willow (*Salix*), locust tree (*Robinia pseudoaccacia*), pedunculate oak (*Quercus robur*), and narrow-leaved ash (*Fraxinus angustifolia*). It is also involved in the activities of the European Forest Genetic Resources Programme (EUFORGEN) and the International Poplar Commission of the Food and Agriculture Organization of the United Nations (FAO).

State forests (about 54%) are managed by Srbija sume (except for the forests of national parks, which are managed by public national park institutions). Srbija sume is also entrusted with professional and technical operations in private forests. Prior to the 1991 Law on the Protection of Forests, municipalities were responsible for these operations. There are no associations of private forest owners.

Srbija sume consists of the head office in Belgrade, 28 forest management districts (including four in Kosovo and Metohija), and 110 forest management units (field directorates). Its strategic goals include integrated forest management, game management and hunting. It manages 67 hunting areas covering 731,910 ha (8.3% of the total hunting area). It also manages five commercial pheasant farms. It has 7,000 to 8,000 forest workers and 850 forest guards (1500 – 2000 ha of forest per guard).

The Institute for the Protection of Nature is an independent public authority established by the Serbian Government. It is responsible, among other things, for physical plans and the implementation of

the nature protection policy, analyses of the impact of construction and other activities on nature; the issue of licences for the collection and export of species. The Institute provides expertise on biodiversity conservation and management to the Ministry for Protection of Natural Resources and Environment.

The Ministry of Agriculture and Water Management is responsible for agricultural development; the protection, use and promotion of agricultural areas; rural development; the food industry; and water management (except water distribution), among other activities.

Serbia's hunting grounds, of which there are 320, were previously under the responsibility of the Ministry of Agriculture and Water Management, within the forestry sector. Since the forestry sector has recently been transferred to the new Ministry for Protection of Natural Resources and Environment, it is not yet clear where responsibility for hunting will lie. Hunting grounds are managed mainly by the Serbian Hunting Association, but State enterprises and agricultural companies also have some managerial responsibilities.

The Faculty of Biology of the University of Belgrade and the Botanical Garden in Belgrade provide research and expertise for nature conservation. The Faculty of Forestry of the University of Belgrade has specialization courses in forestry, wood processing, landscape architecture and erosion control. Post-graduate MSc and PhD courses and programmes in all these four areas are also available.

Non-governmental organizations

There are several non-governmental organizations involved in forestry, biodiversity conservation and environment. Among them are the Yugoslav Association of Hunters, the Yugoslav Association of Forestry and Timber Industry Engineers and Technicians, and the Serbian Association of Hunters.

9.4 Montenegro

There are three main subregions of Montenegro: (1) inland mountains, which dominate the territory, (2) the central lowland plain, characterized by the river Morača, and Skadarsko Jezero, and (3) the Adriatic coast, which is separated from the rest of the country by the Orjen, Lovcen and Rumija mountains. Due to such diverse relief features, the climate varies from Mediterranean on the coast to sub-Alpine on the highest mountains, thus sustaining a very high biological diversity on a relatively small territory.

Biotopes and ecosystems

There is a marine ecosystem with typical Mediterranean species (fish, cephalopods, Echinodermata, Bivalvia, Gastropoda, benthic algae and many others), spreading in littoral, benthic and profound mud bioceoses.

Coastal ecosystems occupy the narrow strip between the sea and the mountain belt (mainly evergreen oak forests, maquis, scrub and garrigue vegetation). These ecosystems are also habitats for many bird species, especially waterfowl in the Ulcinj area (e.g. shelduck, and oystercatcher). There are a number of endemic reptiles in the Skadarsko Jezero ecosystem and surrounding wetlands (a Ramsar site). It is one of the most important wintering sites for waterfowl in Europe (43 bird species were identified during the 1991-2000 period). Additionally, many animal species are characteristic of the water ecosystem, such as snails, crabs, frogs, lizards and fishes.

Forests are spread out over almost half the territory, occupying part of the inland lowlands, hills and high mountains. They provide habitat to many fauna species (roe deer, wolf, bear, wild boar, marten, badger, birds and many others). Oak forests dominate in the lower areas, while beech forests occupy higher zones. Coniferous forests (spruce and fir) are found on the mountains. Black pine forests grow in the valley of the River Tara, and patches of white pine forests can be found on Mount Durmitor. Endemic white bark pine (*Pinus leucodermis*) forest occupies the small central parts, and Macedonian pine (*Pinus peuce*) forest can be found on Mount Prokletije. There are populations of big mammals, such as roe deer, wolf, bear, wild boar, badger and marten.

Altogether forests occupy about 700,000 ha, or about 52% of the territory (1996 spatial plan). The standing volume is about 68 million m^3. The average annual increment is 2.8 m^3/ha and the total annual increment is 1.5 million m^3. Broadleaved species comprise 57%, conifers, 43% and mixed stands 11% of the total wood stock.

Box 9.1: Skadarsko Jezero National Park

About one third of the Lake (Skadarsko Jezero) is within Albanian boundaries, and both Albania and Yugoslavia have recognized the importance of a unified approach to managing its ecosystem. There is an ongoing project entitled "Promotion of networks and exchanges in countries of South Eastern Europe" within the framework of the Stability Pact and focused on the protection of Skadarsko Jezero. Representatives of different sectors from both countries are included.

Table 9.4: Fauna of Montenegro

Animal groups	Number of recorded species
Nematoda	37
Oligochaeta	6 Skadarsko Jezero
Gastropoda	136
Copepoda	68
Notostraca	1
Anostraca	5
Amphipoda	44
Opiliones	15
Pseudoscorpiones	12 (Dinaric)
Acari: Ixodidae	15
Insects	235
Fishes	72 Skadarsko Jezero and Adriatic Sea
Reptiles	57 (southern region)
Amphibians	14
Birds	326
Mammals	65 (2 dolphin species)

Source: Ministry of Environmental Protection and Physical Planning, 2002.

Table 9.5: Flora of Montenegro

Plant Groups	Number of recorded species
Mushrooms	205
Lichens	451
Freshwater algae	930 Skadarsko Jezero
Marine algae	1500
Mosses and liverworts	323
Vascular plants	3136

Source: Ministry of Environmental Protection and Physical Planning, 2002.

Mountain pastures, barren grounds and glaciers provide habitat to chamois and relict and boreal species (e.g. snowfinch and woodlark).

Flora and fauna

There are many endemic plant and animal species (392 Balkan (regional) endemic plant species, or about 7% of Montenegrin flora). Apart from these, even local endemic species, of which there are 46 in Montenegro, are important.

Due to lack of financing, there is no biodiversity inventory and monitoring, and therefore the red books on flora and fauna have not yet been prepared.

Protected areas

The following areas have international protection status:

- The Tara River basin with a surface of 182,000 ha, registered on the List of World Biosphere Reserves – the UNESCO "Man and Biosphere" programme;
- The Durmitor National Park and part of the Tara Canyon, 20,000 ha, registered on the UNESCO List of World Natural Heritage;
- Skadarsko Jezero, on the List of Wetlands of International Importance (Ramsar List) at the end of December 1995;
- Kotor and Risan Bay, registered on the UNESCO List of Cultural and Natural Heritage in 1979; and
- The Biogradska Gora National Park, nominated for the UNESCO List of World Natural Heritage.

The national parks of Montenegro are members of the World Federation of National Parks.

Skadarsko Jezero is a Ramsar site. Lake Sarsko, Lake Biogradsko, Zoganjsko blato, Ulcinjske solane (salt marshes) and Boka Kotorska Bay are possible Ramsar candidate sites.

The River Tara watershed is recognized as a World Biosphere Reserve, and the City of Kotor (including the bay) and Mount Durmitor are registered on the UNESCO list of the World Cultural Heritage.

Table 9.6: National parks of Montenegro

National park	Municipalities	Area (ha)	Altitude (m)
Biogradska gora	Berane, Kolašin and Mojkovac	5,400	832-2 116
Durmitor	Mojkovac, Plužine, Pljevlja Šavnik and Žabljak	32,000	538-2 532
Lovćen	Cetinje, Budva	6,400	985-1 749
Skadarsko Jezero	Podgorica, Bar and Cetinje	40,000	Cryptode-depression

Source: Ministry of Environmental Protection and Physical Planning, 2002.

Threats to biodiversity

Urbanization and infrastructure constructions are the main threats to coastal and marine ecosystems. The development of tourist facilities and housing are not accompanied by adequate nature protection measures, such as waste-water treatment. Vulnerable beach communities are also endangered by tourist activities. For example, halophyte communities on the beaches are seriously endangered and have no protection since the beaches come under the responsibility of the tourist sector. Ulcinj beach is particularly endangered by human activities (see also chapter 14, on tourism and the environment).

Fishing was mainly small-scale and individual until recently. There were 128 fishing boats registered in 1996, but it is estimated that the total number of fishermen using small-scale equipment is actually about three times that figure. The marine ecosystem is more threatened by the use of trawl nets that completely damage the seabed. Illegal fishing also poses a threat to marine ecosystems. Sometimes, explosives are used or other illegal practices (such as the extraction of date-shells by damaging undersea rocks). No accurate data on illegal fishing were available.

Forest management financing has decreased over the past decade, especially forest maintenance (in terms of silvicultural activities and protection from pests and fires). As a result, degradation, particularly of karst forests, has been progressing.

Due to economic problems, the depopulation of rural areas has intensified (mainly old people unable to work in the fields remain). Abandoned or neglected agricultural land and non-maintained forests are serious obstacles to efficient pest and fire control. Illegal forest cutting, cattle grazing and poaching also endanger inland ecosystems and species, although this has lessened somewhat due to the higher rate of emigration from inland areas.

Since 1990, most of the wood processing industry has failed, and the income obtained from wood sold has decreased accordingly. Stealing timber from forest depots is a problem. An average of 2500 ha of forest cover is lost annually due to fires.

Poaching is a serious problem. The environmental inspection and park management staff are too weak (both in number and capacity) to efficiently prevent and control illegal hunting.

Environmental impacts are exacerbated by tourism, particularly uncontrolled tourism. For example, in April 2002, a tourist company was advertising the areas of Mount Durmitor National Park and Skadarsko Jezero as "ideal for hunting quail, pheasant and wild duck … and the end of the year is the right time for hunting wild boar or wolves…", in spite of a hunting ban in national parks that was posted on 13 March 2002 and is still in force (according to the physical plan).

Policy objectives and management

The policy framework

The protected area physical plan is the document that defines the purposes of particular park areas. There are two types of zones: the core zone and the utilization zone (mainly covered with forests, which are the responsibility of the forestry sector). Forest inspectors are responsible for controlling mushroom picking and the collection of medicinal plants and other forest by-products.

Management and conservation activities are contained in the programme of national park protection and use. Most of the park income is obtained from forest cutting (sold timber), hunting and fishing licences. A much smaller share is obtained from rafting, photography and herb collecting licences.

According to the Law on Forests, the main forest management document is the Basic Forest

Management Programme, adopted by the Government for a 10-year period. In addition, a special forest management programme for each forest management unit is also prepared for the same period, adopted by the Forest Management Directorate and approved by the Ministry of Agriculture, Forestry and Water Management. There is, however, no comprehensive forestry policy and strategy.

The list of hunting grounds (2001) defines three categories:

(a) economic – managed by public institutions, of which hunting is the main activity (there are two of them, in Rumija and in Ulcinj). One of the hunting grounds (Rožaj) is managed by the State forest enterprise;
(b) sport and recreational – managed by hunting associations. They are registered as non-governmental organizations although they make a profit out of hunting; and
(c) special purposes (mainly scientific research).

The legal framework

The Law on the Environment (1996) defines the general framework for environmental protection**.** The Law is the basis for a number of regulations that are necessary for a full definition of nature protection policy but are not completely up to date. The harmonization of sectoral acts and other regulations (such as the Law on Nature Protection, the Law on Forests, the Law on National Parks and the Law on Hunting) with the Law on the Environment is planned.

The Law on Nature Protection (1978/1982) appoints the Nature Protection Institute as the authority for granting protected area status to certain parts of nature. Currently, 314 animal and 57 plant species are protected by a special decision on the protection of rare, endemic and endangered animal and plant species (taken by the Institute).

The Law on National Parks (1991) defines national parks as resources of public interest, determining their boundaries and core zone, as well as standards for the protection and use of natural resources.

Other laws that are related to nature protection are:

- The Federal Law on Plant Protection (No. 24/98 and 26/98), which regulates the use of chemicals in agriculture and forestry;
- The Law on Physical Planning (1995), which states that protected areas must be included in physical plans;
- The Law on Marine Fishery (1979, 1992), which prescribes types of marine fishing, nets and other fishing equipment, as well as protection measures for fish and other species (i.e. time periods when fishing is allowed);
- The Law on Freshwater Fishery (1976, 1992), which also prescribes types of fishing, management of fishing areas, licences, fees and protection measures;
- The Law on Seed (1968, 1982), which regulates the collection, storage and use of seed of known provenance; and
- The Law on Hunting (1980, 1992) and related regulations, which establish categories for protected and unprotected game, the duration of the hunting seasons, type of hunting, hunting management, hunting strategy, authorizations for hunting inspection and charges for damage and criminal penalties.

Economic instruments

National parks are mainly financed from the money collected from sold wood from sanitary forest cuts, fishing licences, fees for commercial fishing, photography, rafting, picking mushrooms, medicinal plants and berries, and entrance tickets. A smaller part of income is provided by the State budget.

The institutional framework

The Ministry of Environmental Protection and Physical Planning was established in December 1991, and its legal competence covers the general policy of environmental protection. It is also responsible for biodiversity protection and management, including protected areas. It consists of two divisions: one for Environmental Policy and Information Systems and one for the Quality of the Environment (which is also in charge of species protection and protected area systems), and includes the Ecological Inspection Unit.

The Ministry of Agriculture, Forestry and Water Management is partly responsible for protected area management that is included in the forest management plan. Its responsibilities overlap with those of the Ministry of Environmental Protection and Physical Planning in the control of wildlife

species collecting and trade, fishing and hunting and protected areas where these activities are allowed. The Forest Sector within the Ministry of Agriculture, Forestry and Water Management is responsible for forest policy.

The Forest Management Directorate was established by the new Law on Forests (2001) with fifteen forest management services, located in municipalities. The Directorate manages State-owned forests and approves concessions to the forest enterprises on tender. Forest enterprises (previously a part of Crna Gora Sume) are being privatized.

The Ministry of Tourism is authorized to carry out tourist evaluation of national parks and the control of tourist capacities and services in national parks (such as hotels and restaurants).

The Public Enterprise for National Parks is responsible for the protection and management of four national parks: Mount Lovcen, Skadarsko Jezero, Biogradska Gora and Durmitor. The Enterprise is partly self-financing and partly supported with State grants designated for nature protection. It was established by the 1978 Law on Nature Protection and it is obliged to keep a "cadastre of the condition of plant and animal ecosystems, their communities and habitats." This has not been done so far. The Public Enterprise also controls protection regimes and has the authority to collect fees for the use of natural resources (e.g. hunting, fishing, grazing, cutting wild species).

The Nature Protection Institute (in Podgorica) is responsible for implementing the nature protection policy, primarily by keeping inventories of protected areas and providing research services. The Montenegrin Museum of Nature was founded in 2000. It houses an outstanding collection of flora, fauna and geological samples, and provides expertise in biodiversity research as well. The Republic Administration for Urban Planning, in drawing up physical plans for national parks, also has some responsibilities for biodiversity protection.

Within the university network, the Faculty of Biology (founded in 1996), the Institute for Marine Biology in Kotor, the Agricultural Institute, and the Department of Natural Sciences within the Montenegrin Academy of Arts and Sciences all play an active role in nature protection.

9.5 Conclusions and Recommendations

Recommendations to the Federal Government

Recommendations of relevance to biodiversity conservation and nature protection in Yugoslavia may be found in chapter 4 on International cooperation, in particular recommendations 4.1 and 4.5.

Recommendations to Serbia and to Montenegro

Fragmented nature protection legislation in Serbia and Montenegro does not provide a sufficient basis for efficient biodiversity management, the fulfilment of national nature conservation goals and compliance with pre-accession criteria. Two directives of the European Union that relate to the implementation of the Bern Convention are Council Directive 79/409/EEC on the protection of wild birds and Council Directive 92/43/EEC on habitat protection. Emerald/Natura 2000 Networks and Special Areas of Conservation (SACs), which aim at the conservation of wild flora and fauna habitats, are particularly important for the conservation of endangered habitats and species. In order to participate in these initiatives and to move forward in the pre-accession process, biodiversity legislation should be strengthened and a long-term biodiversity strategy (including medium- and short-term action plans) should be developed.

Recommendation 9.1:
***Serbia**'s Ministry for Protection of Natural Resources and Environment and **Montenegro**'s Ministry of Environmental Protection and Physical Planning should facilitate the harmonization of their nature protection legislation with international biodiversity conservation and management criteria. Cooperation with scientific and public institutions, non-governmental organizations and other stakeholders would facilitate this process.*

Intersectoral cooperation is necessary for the efficient implementation of nature conservation policy. To prevent over-use and ensure a sustainable use of natural resources, the forestry, agriculture, water and tourist sectors should harmonize their legislation with nature conservation requirements and incorporate adequate measures into their management plans.

Recommendation 9.2:
***Serbia**'s Ministry for Protection of Natural Resources and Environment, its Ministry of Agriculture and Water Management and its Ministry of Trade, Tourism and Services and **Montenegro**'s Ministry of Environmental Protection and Physical Planning, its Ministry of Agriculture, Forestry and Water Management and its Ministry of Tourism should:*

(a) Within the next four years, harmonize all of their respective legislation that impacts on nature conservation and protection, agriculture, water and tourism; and

(b) Reflect these harmonized laws in all relevant management plans.
(see also recommendation 12.6.)

Serbia does not have a defined nature conservation policy; neither does Montenegro. Both have to develop nature conservation policies. This should be done through a republic-level consultation process with all stakeholders and in the context of international commitments and agreements and EU legislation and practices.

Recommendation 9.3:
***Serbia**'s Ministry for Protection of Natural Resources and Environment and **Montenegro**'s Ministry of Environmental Protection and Physical Planning, in order to implement the Convention on Biological Diversity and other international agreements, as well as their own nature protection policies, should develop and implement national biodiversity strategies and action plans, in cooperation with international organizations and national stakeholders. The institutional strengthening and capacity building of nature protection administration and management staff at all levels should be included. (see also recommendation 4.5)*

The income of the national parks is obtained mainly from the exploitation of natural resources, rather than through park services. This unsustainable management practice could undermine the main goals of nature protection policies. EU member States are obliged to establish protected areas of regional (European) importance, called the Sites of Community Interest (SCIs), on which all activities that disturb animals and habitat are forbidden (the area should not be less than 10% of the total territory). Countries therefore need to develop SCI management plans and incorporate adequate conservation measures into the sectoral (natural resources) management plans. Management of these areas involves private landowners too.

The Plan for the Future of Montenegro's National Parks, which was prepared in 2002 by Flag International, could serve as a basis for further developing national park management plans. It contains an assessment of current park management and provides recommendations for their further development, particularly with respect to park services (i.e. visitor and transport systems, interpretation and information centre, ranger service).

Recommendation 9.4:
***Serbia**'s Ministry for Protection of Natural Resources and Environment and **Montenegro**'s Ministry of Environmental Protection and Physical Planning, in cooperation with scientific institutions, national park management and other stakeholders, should develop and implement management plans for each national park, according to international standards and best practices, and taking into account the interests of local communities. (see also recommendations 14.2 and 14.3.)*

Due to political and administrative changes in the relationship between federal and republic administrations, as well as within Serbia, the restructuring of "Srbija sume" was envisaged as a first step towards economic improvement. The first phase has recently been completed by splitting the enterprise into two companies: "Vojvodina sume" and "Srbija sume". The second phase will focus on organizational and managerial changes within the new companies. Regardless of the final organizational structure, the importance of multifunctional forestry management has been recognized, but there is no strategic forestry document that would mainstream forest policy towards sustainability.

Forest cover is particularly important for Montenegro: it provides habitat for most of the species, prevents erosion, maintains the freshwater regimes, and, in addition to the marine landscape, is the main tourist attraction.

In order to preserve forest ecosystems and obtain adequate financing, the forestry sectors in both Serbia and Montenegro should make a shift from timber management to multifunctional management that takes into account ecological and social forest

functions. In order to achieve this, they should develop a strategic document with clear long-term goals, and an implementation plan that includes responsible institutions, a timeframe and economic instruments.

Consultants from the Food and Agriculture Organization of the United Nations (FAO) have prepared a draft report that assesses the current forestry legislative and institutional framework, forest production capacity and management, education and capacity building issues, and basic directions for further development of the forestry sector. This report could serve as the basis for further work.

Recommendation 9.5:

***Serbia**'s Ministry for Protection of Natural Resources and Environment, in cooperation with its Ministry of Agriculture and Water Management, and **Montenegro**'s Ministry of Environmental Protection and Physical Planning, in cooperation with its Ministry of Agriculture, Forestry and Water Management, should each develop and implement a national forestry strategy based on sustainable forest management, taking into account international forest certification principles. This should be done in cooperation with all stakeholders, using transparent and internationally recognized procedures.*

PART III: ECONOMIC AND SECTORAL INTEGRATION

Chapter 10

INDUSTRY AND THE ENVIRONMENT

10.1 Yugoslavia

Background

Yugoslavia is an industrially developed country. However, there is a considerable difference between the industrial development of its two constituent republics. Serbia has a large number of large, heavy industries and small and medium-size enterprises (SMEs). In Montenegro, there are many SMEs but few large industries. Nonetheless, two of these are very big, heavy industries.

The economic situation for industry is difficult, largely as a result of the international sanctions imposed on Yugoslavia over the past decade. Due to the country's isolation and the drastic loss of traditional markets and business partners, industrial production plummeted. Difficulties in replacing previously imported raw materials and subsidiary materials and in importing spare parts for industry had serious consequences for the environment. For example, industry applied environmentally inadequate production processes and failed to maintain pollution abatement and cleaning technology and devices such as waste-water treatment plants and air emission filters. This had a devastating impact on air and water quality.

Industrial production fell by approximately 60% between 1990 and 2000. For several years, industries have been operating at about 10% of their production capacity, and many are still operating at between 5% and 30% of their capacity. Some industries were closed down. The lack of funding and investment also seriously hampered the necessary reconstruction and modernization of industry, including the introduction of cleaner technology, and continues to do so.

GDP in constant dollars plunged between 1990 and 1995, rose slightly from 1995 to 1998, and again declined in 1999. Moreover, there was a remarkable negative change in the share of the contribution of industry to total GDP (see figure I.2 and table I.3 in the introduction).

Table 10.1 clearly shows the decline in industrial production during the 1990s. It also illustrates that the manufacturing industry suffered more than the mining industry. It is likely that one of the main reasons for this difference is that the manufacturing industry is more dependent on foreign markets and foreign suppliers of raw materials.

There has also been a serious decline in the numbers of people employed by industry, but this has not been proportionate to the decline of production. In 2001, the unemployment rate in Yugoslavia, based on registered unemployment, was around 28%.

Table 10.1: Indices of industrial production

1990 = 100

	1994	1995	1996	1997	1998	1999	2000
All industry	41	42	45	50	51	40	44
Mining	73	77	76	81	83	59	64
Manufacturing	34	35	39	44	46	32	37

Source : Federal Statistical Office, 2001.

Table 10.2: Number of employed

in thousands

	1990	1992	1993	1994	1995	1996	1997
Total	2,707	2,536	2,464	2,413	2,379	2,367	2,332
Industry	1,067	940	916	894	870	852	820

Source : Federal Statistical Office, 1998.

Table 10.3: Employment by sector of ownership

in thousands

	1990	1995	1996	1997
Socially owned sector	2,641	2,306	2,284	2,238
Private sector	67	265	288	318

Source: Federal Statistical Office, 1998.

In Yugoslavia few enterprises are privately owned. Most industrial employers are either State-owned or, more commonly, what are referred to as socially owned enterprises (SOEs), which means that the workers collectively own the company and can take management decisions and dispose of the assets and incomes of the enterprise. Other companies have "mixed" ownership, i.e. a combination of social capital and privately held shares. The 7,550 socially owned, State-owned and mixed enterprises account for approximately 88% of total employment in enterprises. This includes both large industries and SMEs, although most SMEs are privately owned.

To adapt to the global market economy the governments of Serbia and Montenegro are now trying to strengthen and accelerate the privatization process by introducing new legislation and regulations, which has been facilitated recently by established government agencies. But in addition, there is a need for funding and investment to ensure a smooth and successful privatization process.

Most of the industrialization in Yugoslavia took place during the late 1970s and '80s. Since the country was open to cooperation with Western countries, the technology of the established industries is in general somewhat more advanced than that in some of the other Central and East European countries. However, due to the economic situation and the lack of maintenance and upgrading during the past ten years, there is a substantial need for technological improvement and modernization.

As a consequence, most of the older industries are basically outdated and run-down. Moreover, there are examples of relatively new industries that use outdated and environmentally inadequate technologies imported from Western countries. This represents a considerable environmental problem, and it is critical in relation to the need for future compliance with EU requirements. It also clearly shows the need for an effective environmental permit system in Serbia and Montenegro for the reconstruction and modernization of existing industries and for the development of new industries based on modern and cleaner technologies.

Environmental performance of industry

There are few valid emission and other relevant data from industry, because there is no comprehensive environmental information system and the resources that are allocated for controlling and supervising industry's environmental performance in Serbia and Montenegro are limited. However, the ongoing water, groundwater and air quality monitoring gives some evidence of the negative environmental impact of industrial activities in Yugoslavia (see also chapter 3, on information, public participation and awareness-raising). It is also a fact that most industries, and not least the heavy industries, have no effective treatment of waste-water and no effective protective or abatement measures to limit their emissions and their impact on air, water, soil and groundwater.

The stagnation and decrease of industrial production during the 1990s had a positive impact on the environment as emissions fell and less industrial waste was generated. However, the almost complete lack of abatement and cleaning measures remains a problem. Moreover, trying to increase production by using fairly run-down and poorly maintained technology is likely to exacerbate the environmental and technical problems further.

There is a general lack of environmental management within the industries, and a specific lack of adequate waste management (see also chapter 7, on waste management). Industry reduces the air quality of neighbouring urban areas, the water quality of rivers and the quality of soil and groundwater in the industrialized regions. Furthermore, there are no effective legal requirements or economic incentives for industry to establish and implement environmental management systems even if the legislation to some extent provides for the use of economic tools.

However, in environmental management or eco-management based on the series of international standards ISO 14000, five basic standards JUS ISO 14000 have been adopted (14001, 14004, 14010, 14011, 14012) individually and in the form of series. Two standards (JUS ISO 14040 and JUS ISO Guideline 64) will be published soon, as will five draft standards in the JUS ISO 14000 series.

In Yugoslavia, only about 20 enterprises (metal manufacturing, pharmaceuticals and electric power industry) have been certified as according to the ISO 14001 environmental management standard. All certificates are foreign, because no national system of certification has been formed. The Yugoslav accreditation body JYUAT has started the establishment of its own system of certification and accreditation in eco-management according to JUS ISO 14000.

In the present difficult economic situation, environmental management has not been a top priority for industry, and environmental awareness among industries and the population at large is poor. At the same time, industry acknowledges that proper environmental management and cleaner technologies are crucial if it is to compete in international markets. Industry also expects to come under more pressure from the authorities in terms of enforcement of new legislation and regulations consistent with EU requirements. There is therefore an increasing concern about the availability of necessary funding and investment to fulfil the demands for better environmental management and performance.

The country is able to offer skilled and competitively priced labour, and it has sufficient natural resources. However, external investors are still somewhat hesitant, in part because of the lack of clear policies and strategic action plans for industrial development.

Policy objectives and management

The policy framework

According to the Constitution and the present legislation, the environmental regulation of industry and industrial development is primarily the responsibility of the two constituent republics. However, since Yugoslavia is responsible for international conventions and transboundary issues, effective cooperation and coordination with the environment ministries of the two constituent republics is necessary. It is also stated in the Constitution of Yugoslavia (art. 77) that the Federal Republic shall formulate policies, enact and enforce federal legislation and ensure judicial protection in matters concerning the principles of environmental protection. Accordingly, it is an obligation of the Federal Government to take action if necessary to ensure a healthy environment and timely information about the state of the environment and to formulate policies and enforce legislation.

The legislative framework

The main federal environmental legislation relevant to industry comprises:

- The Law on the Basic Principles of Environmental Protection, No. 24/98 (sustainable development, integrated pollution control, polluter pays principle, public participation, EIA in transboundary context and transport of hazardous waste);
- The Law on Protection against Ionizing Radiation, No. 46/96 (import, export and transit of radioactive materials);
- The Law on the Transport of Hazardous Substances, No. 45/90 (conditions for the transport of hazardous substances, transport safety measures, permits for the export, import and transit of hazardous substances); and
- The Law on the Production of and Trade in Poisonous Substances, No. 15/95 (conditions for the production of and trade in poisonous substances, categories of poisons, packing and use of poisonous substances).

In addition, several of the 64 international conventions that Yugoslavia has ratified are relevant to industrial development and activities, for example:

- The Convention on Long-range Transboundary Air Pollution, by succession, 12 April 2001
- The Vienna Convention for the Protection of the Ozone Layer, by succession, 27 April 1992
- The Montreal Protocol, by succession, 27 April 1992
- The Basel Convention, 18 April 2000

The federal environmental legislation is detailed and supplemented by the environmental legislation and regulations of the constituent republics.

The institutional framework

The Environment Department of the Federal Secretariat for Labour, Health and Social Care has

primary responsibility for matters relating to the environmental management of industrial development. However, other federal authorities are also involved, such as:

- The Department for Health of the Federal Secretariat for Labour, Health and Social Care (production, trade and transport of medicine and poisonous substances; import and export of ozone-depleting substances);
- The Federal Ministry of the Economy and Internal Trade (energy sources, use of mineral resources and groundwater, production and use of radioactive materials, regime of rivers and territorial waters of international interests);
- The Federal Ministry of Interior Affairs (sales and transport of toxic, explosive, radioactive and other hazardous substances); and
- The Federal Ministry for Foreign Economic Cooperation (economic policies, development strategies, foreign trade).

Moreover, two federal institutes are involved in various kinds of monitoring and collection of data and information on the environment and industrial development. These are the Federal Hydrometeorological Institute (interpretation of data on ambient air quality, water pollution and radioactivity), and the Federal Institute for Public Health (collecting and reporting data on health protection, development of health protection standards).

The federal ministries and authorities mainly establish overall policies, strategies and the related administrative principles and general rules and standards to be reflected and detailed in the legislation and regulations of the two republics. Due to the difficult economic situation, the application of many of the adopted standards and principles has been put on hold. In accordance with the constitutional legal framework the federal authorities do not have supervisory competencies over the environmental authorities of Serbia and Montenegro.

The vertical division of responsibilities between the two governmental and administrative levels is not clear. Cooperation with donor organizations and donor countries and coordination of donor-sponsored programmes and projects is another area that calls for more effective cooperation between the federal level and the constituent republics (see also chapter 4, on international cooperation).

There is no integral environmental information system, either at federal or republic levels. Consequently, there is a remarkable lack of sufficiently reliable data to describe emissions and environmental impacts from industrial activities and the related industrial development trends. This is a serious problem when it comes to analysing the present situation and determining the priorities for environmental precautions and remediation measures.

The environmental awareness of industry and entrepreneurs is seriously limited due to the lack of incentives, financing, know-how and experience in environmental management. There is a need to introduce clear policies and strategies for industrial development, including guidance and incentives to enhance environmental awareness and to accelerate the introduction of cleaner technologies and environmental management in the industry.

10.2 Serbia

Conditions and activities in industry

Serbia's large and heavy industries are primarily linked with mining. Serbia is rich in mineral resources and has a tradition of mining. Consequently, after the Second World War, specifically during the late 1970s and 1980s, there was a considerable development of downstream industries such as melting, refining, metallurgical industries, chemical industries and machinery and vehicle production. The mines also supply the thermal power plants.

Other important industrial areas and products are cement and other building materials, fertilizers, electrical equipment, sawmills, wooden furniture, paper products, leather and fur products, yarns and fabrics, rubber, textiles, food products and beverages.

Among the major industries that cause serious air pollution are the following:

- Cement factories: BFC (Belgrade), Novi Popovac (Para) and Cementara (Kosjeri);
- Refineries in Pancevo and Novi Sad;
- Chemical and metallurgical industries: Petrohemija and Azotara (both in Pancevo), FOM (Belgrade), Agrohem (Novi Sad), Zorka and Azotara (both in Subotica), FSK (Elemir), RTB (Bor) and IHP (Prahovo);

- Building components industries: Magnohrom (Kraljevo) and Toza Markovi (Kikinda); and
- Paper mills: Matrox (Fremska Mitrovica) and Bolo Tomi.

Industry is spread out over Serbia but primarily concentrated in the river valleys, in the urbanized regions and close to the mines.

In addition to the international sanctions and the isolation of Yugoslavia starting in 1991, the bombing in 1999 further contributed to the problems of Serbian industry, not least for the refineries and other heavy chemical industries that were among the main targets. Moreover, due to the network and production relationship among the industries, the bombings also had serious consequences for many other industries, including many SMEs.

In general, Serbian industry is still in a reconstruction phase. For the old industries this would require improving and replacing production technology, introducing new, cleaner technologies, re-establishing network and trading partners, and building up new markets. In addition, focusing on production and sales, there is a need to reorganize management, transform ownership and privatize. The means available for investments for these purposes and for the establishment of new industries are still far from sufficient. Consequently, the reconstruction and restructuring of industry is proceeding slowly, and it is difficult to estimate when this process will be completed. Much depends on international reactions and response, both on assistance from donors and on investments and other more complicated market mechanisms. Also, it is still difficult to estimate how many of the old industries will actually survive this difficult period.

Unemployment in Serbia is high – around 800,000 and rising. It is estimated that by the end of 2002 another 100,000 will have been added to this figure. It is also estimated that there are another 300,000 to 600,000 persons latently unemployed (officially employed in enterprises, State institutions, banks and other institutions but who do not actually work). Due to the previously important contribution of industry to the national economy, the current low production and efficiency of industry has a serious impact not only on Serbia's economy but also on its social fabric. However, the direct socio-economic impact is still somewhat limited because most industries, especially the big ones, are still State- or socially owned.

Privatization

In 1991 Serbia passed its own Law on Privatization. Due to hyperinflation and other constraints, the start of the privatization process was not successful. In 1997 a new Law on Ownership Transformation was enacted and a special privatization programme was established, but also without great success. In 2001 a new Law on Privatization was passed, the Ministry of the Economy and Privatization was reorganized and a special Privatization Agency was established for the implementation of the privatization process. Despite this new organization and the stronger focus on and higher priority of privatization, there is no clear date for its completion.

The new Law stipulates that the enterprises that are being privatized may be sold exclusively by public tender or public auctions that allow for free competition among bidders and limit the possibility of preference being given to certain categories of potential buyers.

Unfortunately, many of the socially owned and State-owned enterprises are not attractive to investors and consequently difficult to sell. They tend to have high debts, high redundancy resulting in low productivity and negative cash flow, and run-down production technology. To solve these problems, the legislation allows for certain restructuring processes. The new Law provides that 70% of the total capital of the entity under privatization will be offered for sale to investors. The remaining capital will be allocated to the employees and a privatization account.

Table 10.4: Enterprises and workforce in Serbia by ownership June 2000

	Private	State	Mixed	SOEs	Total
Number of enterprises	50,858	2,118	2,839	4,721	60,552
Number of employees	210,700	23,000	444,400	704,900	1,379,000

Source: ZOP, Belgrade.

Figure 10.1: Industry in Serbia

"The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations".

Source: Ministry for Protection of Natural Resources and Environment, 2002

The privatization process has so far primarily focused on SMEs. About 40% of all socially owned enterprises, representing about 15% of the (initial) socially owned capital, have been privatized so far. Most of the heavy industries and the mines have not yet been privatized, although some are being privatized now.

Restructuring and privatization may lead to increased investment in cleaner technologies and production processes, provided effective environmental regulations and enforcement are in place. It is of course a basic condition for privatization in Serbia that there must be compliance with current laws and regulations, including those that relate to the environment. In addition, it is essential that an environmental impact assessment should be carried out and approved by the Ministry for Protection of Natural Resources and Environment as an integral part of the privatization procedure for the individual enterprises. However, economic aspects have a higher priority in the privatization process than environmental issues. So privatization is not being used efficiently as a tool for improving the environmental performance of industry.

Environmental concerns in industry

There is no systematic management of the data and information that are collected through on-site inspections, emission monitoring and other surveys (see also chapter 3, on information, public participation and awareness-raising). Based on a state-of-the-environment report that was recently prepared for the World Summit on Sustainable Development (Johannesburg, South Africa, 2002), it is clear that the environmental performance of industry remains poor. Furthermore, due to the present lack of resources, funding and investment, it is difficult to estimate how soon adequate improvements in environmental management and the necessary remediation measures and the introduction of cleaner technologies will take place.

The impacts on water resources, air quality and soil are described in more detail elsewhere in this report (see chapters 5 on management of water resources, 6 on air management and 12 on agriculture and the environment). Approximately 95% of all waste water – industrial as well as household – is discharged without any treatment into rivers and lakes. The lack of proper management of industrial waste water has a huge detrimental effect on groundwater resources.

Some 20 large industries have some waste water treatment installations; however, in most cases these are no longer effective. A few new treatment plants for industrial waste water are currently under construction. In general, the smaller industries discharge their waste water through the public sewerage system, whereas the big industries discharge their waste water directly into the rivers, since these enterprises are usually located close to the riverbanks. Most of the industrial waste water is discharged into the Sava River and its tributaries. However, there are no accurate data on the actual quantities of industrial waste water being discharged into the rivers.

Few (mainly new small and medium-sized) industrial enterprises have any kind of effective filters to reduce the negative impact of air emissions on air quality. Unfortunately, hardly any heavy industries, for example steelworks, metallurgical industries, chemical industries and power plants, have air cleaning or air pollution abatement measures. Some of these production plants have previously had some cleaning devices installed, but most of these have been out of operation or insufficiently maintained for the past decade. The negative impact on the air quality of the neighbouring urban settlements is significant.

Industrial waste, specifically hazardous waste, is a huge problem due to lack of proper management and adequate disposal procedures and treatment. It is estimated that the annual production of hazardous waste in Serbia is approximately 220,000 tons, of which approximately 10,300 tons in the Belgrade region. (These numbers do not include hazardous waste from mining, which is several million tons. See table 7.2, chapter 7, on waste management.) Most of the hazardous waste is stored on the premises of the production plants, where there is a risk of soil contamination or where it actually has a terribly adverse impact on the soil and groundwater resources. In many cases the storage of waste generates dust, which also has a negative impact on air quality. A minor part of the hazardous waste is dumped into rivers and lakes.

Owing to the improper handling and storage of hazardous waste, the poor conservation of closed plants and the lack of proper maintenance of operating plants, the risk of chemical accidents has increased. As the industrial enterprises rarely have an effective environmental and risk management system, there is no adequate preparedness either within the industries or within the Government to prevent or limit such chemical accidents.

Box 10.1: Locations in Serbia with major industrial and chemical accident risks

Subotica (Zorka-Holdoing – fertilizers, inorganic acids, Azotara – nitrogen and complex fertilizers)
Pancevo (Refinery - oil products, HIP Azotara – fertilizers, HIP Petrohemija – petrochemicals and chlorine)
Belgrade (Prva iskra, Baric – primary chemicals)
Sabac (HI Zorka – fertilizers, PVC, pesticides)

Source: REC, Environmental Analysis of FR Yugoslavia, March 2001.

During the bombing campaign in 1999, 78 industrial sites were destroyed or damaged, causing serious environmental problems such as emissions of large amounts of harmful substances to the air and rivers and widespread contamination of soil and groundwater. Pollution specifically from Novi Sad and Pancevo was transported downstream by the Danube River to the Danube Delta and the Black Sea. Even more serious were the immediate local effects, for example, on sources of drinking-water supply. Moreover, despite large-scale evacuations, many people were exposed to toxic substances.

So far, the focus of international assistance and donors has been on the four identified major environmental hot spots after the bombings. These are Pancevo, Kragujevac, Novi Sad and Bor. Their serious environmental problems have been surveyed thoroughly under a UNEP programme supported by several donor countries, and an action plan has been prepared for the necessary clean-up and remediation. The action plan is currently being implemented in three of the four hot spots. However, it is also important not to neglect other regions suffering from substantially negative environmental impacts caused by damaged or run-down industries. For these regions, too, surveys need to be undertaken, action plans developed and funding identified.

The total overall consequences of the bombings will not be known more precisely until several years of monitoring and analyses have passed. Moreover, it is difficult to distinguish between the environmental damage caused by the bombings and the environmental problems that already existed due to inadequate environmental performance of industry.

Policy objectives and management

The policy framework

In the present difficult economic situation, environmental management is not among the highest priorities for industry. For many industries the crucial question is still how to survive. The number of unemployed is still increasing, partly as a result of the restructuring and privatization process, but also because of over-employment in the past. For example, it is estimated that 60,000 to 80,000 workers will be laid off before the end of 2002 in the restructuring and privatization of 40 big companies.

The National Spatial Plan for Serbia for 1996 to 2011 sets some guidelines for industrial development mainly for siting but without specific environmental objectives. According to the National Spatial Plan, the following "spatial-ecological" goals have been formulated for industrial development and distribution:

- More even territorial distribution of industrial facilities in accordance with development potential and other factors;
- Further development of industry in cities, in traditional industrial centres, with needed programme-related production, technological and market reorientation;
- Selective development and qualitative transformation of industry in the Belgrade area along with selective relocation of production with locational flexibility to other areas; and
- Development of industry in small centres, particularly in centres of insufficiently developed areas.

A model of controlled polycentric development and distribution of activities is the basis for the long-term spatial planning of industry. This concept entails decentralization in the development and distribution of industry, for example, partial removal of industrial activities from urban areas and especially from the Belgrade area. It is not obvious, however, how quickly this plan can be implemented in a climate of more short-term strategies based on survival and immediate economic growth.

A draft strategy for Serbia's industrial development to 2010 was prepared by the Ministry of Science, Technology and Development in October 2001.

The basic goals include: fast, but sustainable economic development; reduced dependence on natural resources, and increased and efficient use of renewable resources; an open economy; competitive, innovative industry based on knowledge; and increased market potential.

More specific goals are:

- To increase the export rate by 50% by the year 2010; and
- To reach a 90% growth rate of GNP by 2010.

Among the basic assumptions are that there will be direct foreign investments equivalent to US$ 10 billion by 2005 and US$ 25 billion by 2010. Industrial sectors thought to be of specific importance for development are information technology and electronics, pharmaceuticals, food, chemicals, metal processing, textile and clothing, leather and footwear, and timber and wood processing. These goals are presented in very general terms. An overall action plan for industrial development, including clear operational environmental issues, has not yet been developed and adopted by the Government.

The legislative framework

The legal framework for the environmental management and operation of industrial premises is characterized by a high number of laws and regulations with many redundancies as well as many gaps. The authorities involved believe that an unclear division of responsibilities and the insufficient cooperation and coordination among them represent a serious problem. In addition, the very limited resources allocated to the administration and enforcement of environmental legislation and regulations are far from sufficient to ensure effectiveness.

The most important law for managing environmental impacts from industrial activities is the Law on Environmental Protection. This Law and the Regulations on Environmental Impact Assessment of Facilities and Works establish the EIA procedure, which is obligatory for new industrial activities. Other relevant laws and regulations are the Law on Waters, the Law on the Handling of Waste Substances and the Regulations on the Handling of Hazardous Waste.

A new environmental framework law has been prepared but not yet adopted by the Government. This draft law on the environmental protection system has been designed to modernize the legal framework and to ensure compatibility and compliance with EU requirements. It should promote harmonization with the EU Directive on Integrated Pollution Prevention and Control (IPPC), thus institutionalizing a modern permit and audit system for industry. However, being a framework law, it must be supplemented by more specific legislation and regulations. At present the aim is to fully harmonize legislation with EU requirements and have industry comply with it by 2010.

The institutional framework

The Ministry of the Economy and Privatization is in charge of industrial issues and SMEs. It has two agencies: the Privatization Agency and the Agency for SME Development. The Ministry for Protection of Natural Resources and Environment is the most important environmental authority in Serbia.

Several other authorities and agencies are also involved and responsible for important issues related to industrial environmental management and the protection of the environment against negative impacts from industrial activities. The most important are:

- The Ministry of Construction and Urban Planning (urban planning and operating permits);
- The Ministry of Agriculture and Water Management (protection of soil, and water resources, control of impact from waste water);
- The Ministry of Energy and Mining (mining, permits for exploitation of mineral resources);
- The Institutes of Public Health (monitoring air, noise, water and groundwater quality). The Institute of Public Health of Belgrade is also the national focal point for the Basel Convention); and
- The Republic Hydrometeorological Institute (monitoring air and water quality)

There are also other institutes involved in monitoring and in preparing EIA documentation, such as the Kirilo Savic Institute and the Institute for Work and Environmental Protection.

The resources allocated to environmental management issues and to the enforcement of environmental legislation are very small. The Ministry for Protection of Natural Resources and Environment is responsible for environmental impact assessment and for environmental control

and supervision of industry. The Ministry has only 27 inspectors for industrial activities in Serbia. Compared to countries with effective environmental management and based on the number of industries in Serbia, this number is totally inadequate. For instance, in Denmark it has been agreed that there should be one inspector for every 10,000 inhabitants to enforce environmental legislation effectively. In Serbia, this would mean a minimum of 500 inspectors at republic and municipal levels.

Although the institutional set-up is still rather centralized, the municipalities also have some responsibilities of relevance for industrial environmental management, especially regarding urban planning, permits for smaller industrial facilities, inspection and control, waste collection and operation of landfills. However, in most cases the resources allocated for these responsibilities are also far from sufficient. In fact, many municipalities have not yet established an environmental secretariat. In other, still relatively few, cases the municipalities have taken a strong interest in environmental issues, but are constrained by a lack of a clear definition of responsibilities and legislative authority.

Industry, represented by the Union of Employers, is a committed negotiation partner for the Government in preparing new legislation. The Union of Employers, which was established in 1994 as a non-political organization, is accepted by the Government and internationally as the legitimate representative of employers in Serbia. It is the only such representative in the social dialogue with the Government. With more than 100,000 members representing both individual private companies and associations, the Union is not only able to share its experience and technical know-how with the Government, but it is also in a position to take ownership of the legislation and acknowledge its responsibility for implementation.

The adoption of the new environmental law and the recent establishment of the Ministry for Protection of Natural Resources and Environment are expected to be the starting point for a necessary comprehensive restructuring, modernization and clarification of the legal framework for ensuring effective environmental management and performance in industry.

Efficient enforcement of the new legislation will be crucial. So far the command-and-control approach has been the usual practice. In the future, a more information-friendly approach should be promoted by the authorities in relation to industry, based on the idea that policing should not be the sole means of enforcement, but should as far as possible go hand in hand with guidance and with a process of dialogue with the industries. Still, the overall goal should be to obtain compliance. However, this goal may become easier to obtain if industry has an understanding of the importance and advantages of better environmental performance and, consequently, a stronger feeling of commitment and responsibility.

The introduction of cleaner technologies is still very much left to industry itself, and thus far this has mainly happened in the new industries, which in general are SMEs. Proper environmental management systems are also still quite rare. A few industries have obtained an ISO 14000 certificate. There are neither clear policies nor any specific legislative requirements for the obligatory introduction of cleaner technologies. However, the coming legislation, not least the new permitting and auditing system based on the EU IPPC Directive, will make it obligatory not only for new industries but also for existing industries to introduce cleaner technologies, and generally to use best available techniques (BAT).

The most important regulatory tool at present to ensure adequate environmental performance is the EIA requirement for new industries and for industries being privatized. Public hearings and public participation are not yet practised and integrated into the EIA procedure. To ensure that EIA is not only a paper exercise, proper enforcement through efficient control and on-site inspections is necessary. This again calls for the allocation of sufficient resources.

Ecological audits of existing industries are not common practice, as they are not compulsory. Due to the limited resources of the Ministry for Protection of Natural Resources and Environment, control and inspections are mainly initiated on the basis of specific complaints.

Economic tools

The polluter-pays principle was adopted by the Government in the Law on Environmental Protection but not implemented effectively. The Law also provides for the use of some economic tools (eco-taxes and compensation for the use of natural resources) and for the establishment of an environmental fund to strengthen environmental

management and to improve the environmental performance of industry. However, economic tools have not been used effectively for more than a decade, and the money from the Environmental Fund is not used specifically for environmental purposes. Voluntary agreements with industry also do not appear to be used, and it is also quite apparent that the penalties for violating environmental laws and regulations are so small that they are almost negligible to the industry. This is an issue that needs to be improved through the introduction of new legislation and regulations. It is also important that penalties, eco-taxes and other environmental levies are used for environmental management issues (see also chapter 2, on economic instruments and financing).

In general, the system of discharge fees is not implemented consistently or effectively. Moreover, to be effective the fees must be relatively high, which is not the case. Thus the fees do not inspire the industries to clean up their act.

Due to the current economic situation there is an almost complete lack of effective economic incentives for Serbian industry to ensure better environmental performance and introduction of cleaner technologies. The design, introduction and use of economic instruments for environmental management in Serbia and the identification of means and methods of funding will require close cooperation and coordination with other Serbian government agencies, primarily with the Ministry of the Economy and Privatization.

10.3 Montenegro

Conditions and activities in industry

Montenegro is not as heavily industrialized as Serbia. Due to its geography, it is characterized by large, sparsely populated regions, with industry concentrated in a few more urbanized areas. Although the mineral resources from Montenegro's mines are of relatively low quality (see also Chapter 6, mineral resource management), the mining industry has been the starting point of its industrialization.

Most industries are small or medium-sized enterprises (SMEs). However, there are a few larger, heavy industries in steel and iron, metal processing, beer production and the manufacturing of glass, paper, soap, detergents and household appliances. Yet all of these industries are relatively minor compared to the huge aluminium production plant Kombinat Aluminijuma Podgorica (KAP) in Podgorica. This single enterprise, which has approximately 4,000 employees (more than 10% of the local labour force), accounts for approximately 81% of Montenegro's export. KAP consumes 45% of Montenegro's total electricity production. Sixty-five per cent of the shares belong to the State, and the balance to the workers. The company has huge debts, which are an obstacle to privatization. The Government has looked into the prospects for privatization and is reportedly willing to sell the company as a whole, but would prefer to privatize the primary aluminium assets and the downstream assets separately. In any case, there are as yet no prospective investors.

Industrial reconstruction and restructuring is proceeding at a relatively modest pace, and there is a high rate of unemployment – around 40%. The number of unemployed is approximately 84,000 (in 2000). As in Serbia, potential donors and investors still seem to be somewhat hesitant, in part because of the lack of clear strategic direction for industrial development.

Table 10.5: GDP and employment in Montenegro

mill. dinars

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total GDP	1,778	3,490	272,241	..	1,021	1,916	3,992	5,209	7,604
GDP of public sector	1,564	2,911	193,390	..	476	862	1,616	1,396	1,691
GDP of private sector	206	474	46,272	..	344	592	1,182	1,662	2,545

persons

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total employment	164,616	150,975	143,798	..	144,899	141,126	140,845	135,711	134,146
Employment in public sector	153,764	136,543	115,540	..	97,380	81,984	69,466	61,645	58,616
Employment in private sector	10,296	12,432	16,508	..	20,104	21,986	21,981	25,137	24,682

Source: Republican Secretariat for Development, 2000.

Table 10.6: Employment indices in Montenegro

1989 = 100

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total employment	100	95.6	91.7	95.3	..	100.8	97.4	99.8	96.4	98.8
Employment in public sector	100	92.7	88.8	84.6	..	84.3	84.2	88.3	88.7	84.4
Employment in private sector	100	162.6	120.8	132.8	..	121.8	109.4	100.0	114.4	98.2

Source: Republican Secretariat for Development, 2000.

Table 10.7: Share of GDP of SMEs in Montenegro

million current dinars

	1989	1190	1991	1992	1993	1994	1995	1996	1997	1998
GDP of Montenegro, total	43.5	17.8	3.5	272.2	..	1.0	1.9	4.0	5.2	7.6
GDP of SMEs and shops	3.1	2.1	474.0	46.3	..	344.0	592.0	1.2	1.7	2.5
Share of SMEs in %	7.1	11.6	13.6	16.9	..	33.7	30.9	29.6	31.9	33.5

Source: Republican Secretariat for Development, 2000.

At present the Government does not intend to promote either the establishment of new heavy industries or the expansion of existing ones. Instead, it intends to support faster growth of the SME sector and to stimulate privatization. However, limited export possibilities and the lack of technical and managerial skills among entrepreneurs still hinders the development of the SMEs.

Privatization

Privatization was initiated in 1989 and is proceeding at a modest pace, although it is far from complete. A special agency, the Agency for Reconstruction and Foreign Investment, was established for restructuring the economy, attracting foreign investments to Montenegro and promoting privatization. Another government agency, the Agency for the Development of Small and Medium-sized Enterprises, was established at the end of 2000 specifically to facilitate the establishment of SMEs. Both agencies are directly subordinate to the Government – not to any specific ministry.

The first stage of the privatization process was to transfer a majority of the ownership of the individual enterprises to three State-managed funds, with employees retaining a minority of the shares (10%). The three funds are the Development Fund, which receives 60% of the funds; the Pension Fund, which receives 30%; and the Unemployment Fund, which receives 10%. The workers also have the right to purchase an additional 30%. These funds are obliged to sell their entire stake within five years of the restructuring of an enterprise with a minimum of 20% sold each year.

Through the selling of fund stocks and privatization using the mass voucher system, 57% of the capital has been privatized. Altogether, 130 enterprises have been completely privatized, and an additional 200 have been privatized over 70%.

By mid-1996 the first phase was almost complete, with 96% of the enterprises transferred from social ownership to ownership by the funds and the employees. However, the next phase, which to some extent depends on foreign investors, is likely to be more difficult to implement.

As in Serbia, industries are obliged to comply with all relevant legislation and regulations in the process of privatization. However, there are no specific environmental obligations, and environmental authorities are not partners in this process. Much remains to be done in order to use the privatization process as an effective tool for introducing cleaner production and improving the environmental performance of industry.

Table 10.8: Enterprises and workforce in Montenegro by ownership

	Private	State	Mixed	SOEs	Total
Number of enterprises	5,582	92	435	166	6,284
Number of employees	18,442	689	44,520	23,603	87,546

Source: ZOP, Belgrade.

Environmental concerns in industry

As stated in the State-of-the-Environment Report 2000, only very limited information is available on the polluting industries in Montenegro. However, the relatively low level of industrial technology and the lack of proper maintenance of most of the industrial production plants cause serious environmental concerns. This is compounded by insufficient environmental management and the absence of adequate waste management and waste-water treatment.

The most critical example of industrial pollution in Montenegro is the huge aluminium production plant KAP. This enterprise gives rise to major environmental concerns not least because of its location close to the capital Podgorica and to the Skadarsko Jezero natural reserve and Ramsar site.

The main production facilities of KAP include an alumina refinery, a primary aluminium smelter with a small secondary recovery plant; strip casting, cold rolling, foil rolling, conversion and extrusion; wire and cable manufacturing; and a billet casting and forging plant. Its production capacity and actual production, respectively, in tons per year, are:

- alumina refinery: 280,000/210,000
- primary aluminium smelter: 102,000/102,000
- strip casting: 13,500/1,693
- billet casting: 10,500/758

The production plant operates virtually without any effective pollution abatement measures or treatment installations. Consequently, the electrolytic process and the anode production plant cause serious air pollution from fluoride, phenols and polycyclic aromatic hydrocarbons (PAH). Moreover, huge deposits of waste – including about 7 million tons of "red mud" (a waste product from the aluminium production) -- have a substantially negative impact on the groundwater mainly because of its caustic soda content. The relatively unprotected storage of large quantities of hazardous waste, including 70 tons of PCB waste, also represents a serious risk of soil and groundwater contamination (see also Chapter 7, on waste management). Pollution from the discharge of untreated waste water flows into the Skadarsko Jezero nature reserve.

The Boris Kidric steelworks in Niksic is another large, heavy industry with a significant environmental impact. This factory operates practically without any filters or scrubbers and, consequently, emits a range of heavy metals, PAH, noxious gases and particulate matter. The ambient air quality of neighbouring areas is quite poor and clearly breaches the standard limit values.

There are several other cases of serious negative industrial impacts on the air quality from industrial activities, including, for example, the shipyard in Tivat and the Rivijera detergent factory in Kotor. In general there are air quality problems in most industrialized and urbanized areas in Montenegro (see also chapter 6 on air management).

Common to almost all industries in Montenegro is the lack of proper treatment of waste water, which is discharged either directly into the rivers or the sea or via municipal sewerage systems that have no effective treatment. Examples are the brewery in Niksic, the tannery in Berane and the Rivijera detergent factory in Kotor. The result of the discharge of untreated industrial and municipal waste water into the rivers and the sea is poor water quality of the recipient bodies of water in the industrialized and urbanized regions such as the Kotor Bay, the River Zeta and Skadarsko Jezero.

Another common problem for the industries, is the almost complete lack of proper waste management and of adequate and safe disposal of all kinds of waste from industrial production processes. Most solid waste from industries is disposed of at unprotected dumpsites, thus representing a source of soil and groundwater pollution. There are about 20 registered municipal dumpsites for solid waste and numerous unregistered deposits, but none of them is a properly constructed sanitary landfill (see also chapter 7, on waste management).

There are no organizations or facilities for the collection and treatment of hazardous waste in Montenegro. Huge quantities of hazardous waste are either deposited in unprotected landfills or stored on-site. In addition, plants are poorly maintained, and the risk of chemical accidents has increased. As with Serbia, there is no risk management system or preparedness strategy available to prevent or mitigate chemical accidents.

Box 10.2: Risk of chemical accidents

Major generators of hazardous waste that are risks for contamination of soil and groundwater and for chemical accidents include:

- The KAP aluminium plant in Podgorica
- The Boris Kidric ironworks in Niksic
- The Rivijera detergent factory in Kotor
- The IHP fertilizer factory in Prahovo
- The shipyard in Tivat
- The Kristal glass factory in Rozaje
- The Obod factory in Cetinje
- The paper factory in Rozaje
- The metal processing industries: Radoje Dakic and Elastik in Podgorica, Metalac in Niksic, Anemos and Termovent in Berane and ILK in Kotor

Source: State-of-the-Environment Report, Ministry of Environmental Protection and Physical Planning, November 2000.

Policy objectives and management

The policy framework

In 1991 Montenegro declared itself an Ecological State, but the strategy that was prepared to implement this does not specify any detailed requirements or actions to be taken in relation to industry (see also chapter 1, on the decision-making framework for environmental protection). Moreover, when the international sanctions became effective and the economy declined during the 1990s, there were no financial means and no incentives for industry to pay special attention to the environment. Therefore, despite its status as an Ecological State, Montenegro has not yet given sufficient attention to raising environmental awareness and providing incentives to industry to improve environmental management. There is, however, a growing acknowledgement that, in order to compete for international trade, Montenegro will need to do so.

Montenegro has been focusing more on the environment, and it has developed terms of reference for a strategic environmental action plan. According to these terms of reference, the action plan will, among other things, deal with specific sectors such as industry and mining, energy, agriculture and tourism, and it will look at the relevant environmental management issues to foster, for example, better air quality, water quality, waste management and noise abatement.

The legislative framework

According to the Law on the Environment and the Regulations on Environmental Impact Assessment all new industries are subject to an EIA before a construction and operating permit can be granted. The Law on the Environment does not provide for a specific environmental permit system. The resources and institutional capacity of the Ministry of Environmental Protection and Physical Planning to follow up and to control compliance with the EIA and other general environmental requirements are extremely limited. Montenegro has only four environmental inspectors for industrial activities. Self-monitoring based on voluntary agreements is not used effectively. For new industries that are expected to rely on investment and management from large international companies, self-monitoring and voluntary agreements will be important.

In addition to EIA, the Law on the Environment introduces other principles relevant to industrial development such as: the reduction of environmental risks, the substitution of cleaner or safer technologies, the replacement of chemicals with less hazardous or harmful substances, the polluter-pays principle, the user/consumer-pays principle, and the involvement of and information for the public. To clarify and facilitate the application of these principles, regulations and standards have been under preparation since the Law was passed. A deadline of April 1998 was set for their establishment but not complied with, according to the State-of-the-Environment Report. Moreover, there is a need now for ensuring harmonization of the present legislation and regulations with EU requirements and standards.

Other legislation and regulations of importance for industrial development and the environment under the authority of the Ministry of Environmental Protection and Physical Planning are:

- The Law on Air Protection;
- The Regulations on Admissible Concentrations of Harmful Substances in the Air; and
- The Law on Nature Protection,

or under the authority of the Ministry of Agriculture, Forestry and Water Management:

- The Law on Waters;
- The Regulations on the Quality of Waste Waters; and
- The Regulations on the Classification and Categorization of Waters.

The institutional framework

Industrial development is primarily regulated in Montenegro by the Ministry of the Economy (responsible for mining, energy and industry) and the Ministry of Environmental Protection and Physical Planning (responsible for the application of the Law on the Environmentand related legislation). The Agency for Reconstruction and Foreign Investment in actively involved in troubleshooting concrete problems that occur in restructuring.

Other ministries are also involved in the regulation of industrial activities such as the Ministry of Agriculture, Forestry and Water Management (management of water resources, and agro–industry, production of food, drink and cigarettes) and the Ministry of Maritime Trade and Transport. The Centre for Ecotoxicological Research of Montenegro, the Republic Hydrometeorological Institute and the Institute of Public Health are involved in environmental monitoring (see also chapter 3, on information, public participation and awareness-raising).

According to the 1991 Law on Self-government, the municipalities also have some responsibilities regarding environmental issues, for example the protection of water and nature. However, the municipalities are in general not effective owing to their lack of resources and experience. Moreover, according to the State-of-the-Environment Report 2000, the present legislation dealing with environmental management issues in Montenegro is somewhat complicated and involves several authorities, without any effective coordination. There is a clear need for closer cooperation and improved coordination and exchange of information between the ministries involved in industrial development and environmental management.

Economic instruments

The economic instruments defined in the Law on the Environment are environmental charges for investments that require an EIA (1-2% of the investment value), environmental pollution taxes (charges on emissions and waste and the use of certain products), and tax exemptions and subsidies to environmentally friendly industries. Charges on waste-water discharges are defined in a separate decree, and their size depends on the amount and composition of the waste water (see also chapter 2, on economic instruments and financing).

However, at present there is no effective use of economic incentives or other economic tools to ensure the introduction of environmental management systems and cleaner technologies in industry. Very few industries have obtained an ISO 14000 certificate. The legislation provides in principle for eco-taxes to be based on actual emissions. However, as industrial emissions are not monitored in general in Montenegro, there is no proper basis for the collection of such taxes from industry.

10.4 Conclusions and recommendations

Recommendations to the Federal Government, Serbia and Montenegro

The present environmental legislation is not up to date at either federal or republic levels. Among the most serious shortcomings are the lack of a clear division of responsibilities among the authorities involved and the lack of effective economic tools to enhance and facilitate the introduction of cleaner technologies and of proper environmental management. The shortage of trained staff, low environmental awareness and the lack of experience in environmental management are also serious concerns, as is the current lack of financing and investors. Moreover, there is a need for harmonization with EU requirements and standards.

After the period of reduced production and overall economic decline, a thorough modernization and reconstruction of industry is necessary to make the country competitive on international markets and to prepare for EU membership. Proper environmental management and the introduction of cleaner technologies should be key issues in this

modernization and reconstruction process. National policies and strategic action plans for industrial development should be prepared and adopted at the federal level and at the republic level. The introduction of cleaner technologies and environmental management is still very much left to industry. There is a need for incentives and for guidance to accelerate industrial modernization. This should be undertaken jointly by the authorities and industry.

However, guidance and assistance to industry and new legislation, regulations and guidelines are not enough without proper enforcement. This requires the institutional strengthening and capacity building of the environmental authorities. Moreover, effective cooperation should be promoted with industrial associations and other stakeholders and NGOs. Environmental action plans and priorities should be discussed and agreed with industry, which should then share the responsibilities and obligations involved.

Reconstruction, modernization and strengthening of the industrial sector are crucial for Yugoslavia's economy and social welfare, and improving the environmental performance of its industry is crucial to ensure its competitiveness on international markets and to comply with EU requirements. In the short term, this is likely to require both investments and substantial contributions from donors. The development of consistent policies and an overarching action plan could help to attract both. The action plan would be strengthened if it were based on consensus among the federal authorities and the two republics.

Recommendation 10.1:
*The **Federal Secretariat** for Labour, Health and Social Care, as soon as possible and in cooperation with the Federal Ministry of Economy and Internal Trade, and with the authorities responsible for environmental management and industrial development in **Serbia** and **Montenegro**, should develop an overall strategic framework and action plan for the reconstruction and modernization of industry, with agreed priorities, as the basis for discussions with potential donors and external investors.*

Due to the improper handling and storage of huge amounts of hazardous waste, the poor conservation of closed-down plants and the lack of proper maintenance of production plants in operation, the risk of serious chemical accidents has increased. As few industrial enterprises have an effective environmental and risk management system, there is no adequate plan for preventing, limiting and abating chemical accidents effectively.

Recommendation 10.2:
*The **Federal Secretariat** for Labour, Health and Social Care, in cooperation with the Federal Ministry of Interior Affairs and the environment ministries of **Serbia** and **Montenegro**, should, as soon as possible:*

(a) *Make a thorough review of current practice and problems in the handling, storing and depositing of hazardous substances from industry and of related chemical spills and risks of chemical accidents;*

(b) *Based on this review, develop an up-to-date strategy and an action plan for the remediation of chemical spills and for the prevention of chemical accidents and of other negative environmental impacts from the handling of hazardous substances;*

(c) *Review, update and enforce the requirements for industry to establish a risk management and safety system in collaboration with the relevant authorities; and*

(d) *Review and update, as necessary, current procedures for the authorities involved in emergency operations in the event of chemical accidents. These procedures should take account of those contained in the UNECE Convention on the Transboundary Effects of Industrial Accidents and the Seveso Directive.*

(see recommendation 10.8)

Recommendations to Serbia and to Montenegro

It is quite apparent that there is a need for a more effective promotion of cleaner technologies and for assistance and guidance to industry so as to accelerate the necessary improvement of its environmental performance. Other countries in Central and Eastern Europe have had good results from clean production centres and from demonstration projects for cleaner technologies. This experience and know-how can easily be adapted to and used effectively in Serbia and Montenegro.

The clean production centres and the demonstration projects should primarily aim at promoting a general interest in introducing cleaner technologies and transferring technical and

managerial know-how. They could also provide direct technical assistance to the individual industries to ensure that they choose appropriate technology and to provide advice on financing.

These activities could be funded through a combination of grants, fees and soft loans. The industrial associations should be partners with the Government in the management and operation of the centres and the demonstration projects. Current donor countries and international organizations already active in the promotion of cleaner production (for example, UNEP and UNIDO) should be considered as sources of potential support.

Recommendation 10.3:
***Serbia**'s Ministry for Protection of Natural Resources and Environment, in cooperation with its Ministry of Economy and Privatization, and **Montenegro**'s Ministry of Environmental Protection and Physical Planning, in cooperation with its Ministry for Economy, should:*

(a) *Establish a clean production centre and promote the introduction of cleaner technologies, environmental management and international environmental standards in industry (see also recommendation 8.4); and*

(b) *Develop action plans for the clean production centre to promote demonstration projects for cleaner technologies and environmental management systems within selected priority areas. The economic advantages and the means of financing cleaner technologies should also be highlighted in the demonstration projects.*

This activity should be undertaken in cooperation with other institutions currently involved in cleaner production activities and with important stakeholders such as industrial associations, private banks and universities. (see also recommendations 4.4 and 7.2 b)

In Serbia, an environmental impact assessment is carried out as part of the privatization procedure for individual industries. However, the integration of EIA in the privatization procedure is not a sufficient guarantee that cleaner technology will be introduced adequately. At present environmental legislation is being updated, inter alia, to ensure compliance with EU requirements, including the Directive on Integrated Pollution Prevention and Control (IPPC). Consequently, no industry should be granted permission to privatize without ensuring full compliance with environmental requirements. It is, therefore, necessary to improve and amend the privatization procedure so that it can be used as an efficient tool to introduce environmental management and cleaner technologies in existing industries and to ensure closer cooperation between the environmental authority and the Agency for Privatization.

In Montenegro, no industry should in the future be granted permission to privatize without ensuring full compliance with the applicable environmental requirements and EU standards. This requires improving and amending the privatization procedure so that it can be used as an efficient tool to introduce environmental management and cleaner technologies in existing industries and to ensure closer cooperation between the environmental authority and the Agency for Reconstruction and Foreign Investment.

Recommendation 10.4:
***Serbia**'s Agency for Privatization and **Montenegro**'s Agency for Reconstruction and Foreign Investment should include environmental clauses in the sales contracts for the privatization of enterprises and industries.*

Recommendation 10.5:
*The Government of **Serbia** and the Government of **Montenegro** should regulate and increase the role of their environment ministries in the privatization of enterprises and industries by introducing environmental audits or environmental impact assessments including cost estimation of the environmental damage from past pollution.*

Recommendations to Serbia

Following the difficulties of the past decade, a thorough modernization and reconstruction of industry is necessary for Serbia to become competitive on international markets. Serbia can offer a competitive and skilled labour force, but the present production technology and the environmental performance of its industry are not sufficient to ensure competitiveness on the European and international markets. Proper environmental management complying with EU requirements and the introduction of cleaner technologies should be key issues in industry's modernization and reconstruction. A strategic action plan for industrial development should be prepared and adopted.

Recommendation 10.6:
The Ministry of Economy and Privatization, in cooperation with the Ministry for Protection of Natural Resources and Environment and the Ministry of Health, should prepare and adopt an action plan for industrial development that takes full account of the health of the population and the sustainability of the environment.

The resources allocated for the administration and enforcement of present environmental legislation and regulations in relation to industry are extremely limited. Parallel to the current legislative review and the establishment of the new Ministry for Protection of Natural Resources and Environment, there is a clear need for allocating additional and sufficient resources for the control and supervision specifically of polluting industries. This will require substantial efforts in institutional strengthening and capacity building to ensure technical skills and know-how.

The implementation and proper follow-up of EIA procedures and an environmental permit arrangement in compliance with the EU IPPC Directive put heavy demands on the staff of the authority in terms of professionalism, experience and technical and managerial know-how. Direct control, supervision and on-site inspections should also be supplemented by self-monitoring, for example, based on voluntary agreements and environmental management systems adopted by individual industries. Moreover, it is important to establish effective data management and reliable information systems based on the useful information that will normally be collected from an efficient control system and from self-monitoring programmes.

Recommendation 10.7:
The Ministry for Protection of Natural Resources and Environment should draw up a detailed action plan for institutional strengthening and capacity building in the enforcement, inspection and control of industry's environmental performance to be implemented as soon as possible. The plan should specifically focus on:

- *The effective organization and use of the resources of the Ministry allocated for the enforcement, inspection and control of polluting industries;*
- *The identification of needs for additional resources;*
- *The improvement of professional skills and technical know-how in environmental management, pollution abatement, cleaning measures and cleaner technologies;*
- *The provision of the necessary equipment;*
- *The standardization of the inspectors' work;*
- *Possibilities for delegation to the municipalities; and*
- *The introduction of self-monitoring through voluntary agreements*

(see also recommendations 1.4 and 6.3).

Efforts to clean-up potential risk areas and hot spots should continue and concentrate on those locations where the risk of danger to public health, soil pollution and groundwater contamination are the highest. There is a need for more thorough investigation to identify risk areas and to estimate the actual risks as the basis for an action plan for clean-up and remediation. Efficient investigation and planning will also be necessary to ensure the necessary additional financial support and technical assistance from the international community for further clean-up and remediation.

There is an increased risk of chemical accidents with potentially serious effects on public health. So far four hot spots have been identified and comprehensive clean-up activities have been initiated at three. However, other locations in Serbia also threaten serious risks and considerable negative impacts on the environment.

Recommendation 10.8:
The Ministry for Protection of Natural Resources and Environment should assess both the need for clean-up operations additional to the already planned activities and the potential risk of chemical accidents. An action plan should be prepared and implemented to ensure the necessary clean-up operations and to minimize the identified risks. (See also recommendation 8.1. and 10.2)

Recommendations to Montenegro

Industry in Montenegro is characterized by many SMEs and relatively few large, heavy and heavily polluting industries. The introduction of cleaner technologies is proceeding slowly and mainly affects new industries. Effective cleaning and pollution abatement measures are rare. Consequently, huge quantities of waste water are discharged into the rivers and the sea, the air

quality of the industrialized and urbanized regions is poor and the negative impact on groundwater and soil is critical in some areas due to the inadequate depositing and storage of solid waste and hazardous waste from industry.

Present environmental legislation is not up to date and does not comply with EU requirements and standards. The resources allocated for the administration and enforcement of environmental legislation are far from sufficient. More resources and institutional strengthening and capacity building are urgently needed.

The introduction of cleaner technologies and environmental management is still very much up to industry itself. Industrial modernization should in fact be the joint responsibility of the Government and industry, particularly given the conditions for approximation to the EU.

At present EIA is the most important legal tool for the environmental control of industrial development. However, EIA focuses only on new industrial development and does not adequately deal with the environmental problems of existing industries. There is a need to supplement EIA requirements and procedures with an environmental permit and auditing system to ensure that existing industries comply with EU requirements and standards.

New legislation should also clarify the respective responsibilities of the authorities in both environment and spatial planning and help to ensure proper coordination between them. It should also provide for public participation and the involvement of stakeholders.

Recommendation 10.9:
The Ministry of Environmental Protection and Physical Planning, in connection with the upcoming environmental action plan, and in close cooperation with other relevant ministries, should undertake a thorough review of present environmental legislation and regulations in order to ensure, inter alia:

- *Harmonization with European Union requirements and standards with respect to industry and environment. This should include the adoption of an integrated permit and auditing system respecting the European Union IPPC Directive;*
- *Provision of the necessary resources for administration and enforcement, including control, inspection and supervision; and*
- *Industrial self-monitoring based on voluntary agreements.*

Chapter 11

ENERGY AND THE ENVIRONMENT

11.1 Yugoslavia

General trends in energy supply and energy consumption

In the production of primary energy in 2000 totalling 409.1 PJ (9.77 Mtoe), the share of coal was 64.8%, fuel wood 8.9%, liquid fuels 9.9%, gas 5.8% and hydropower 10.6%. In the period of economic sanctions, lignite, mainly of low quality, with great adverse impacts on the environment, was the main source of primary energy.

The consumption of primary energy, about 1.1 tons of oil equivalent per capita, is low compared to West European countries. Simultaneously, consumption per unit of gross domestic product is growing and energy intensity is constantly increasing.

In Yugoslavia energy consumption is high in industry but below average in transport and tertiary activities. Furthermore, the percentage of electric power consumed is high, especially in the household sector. A potential reduction in energy intensity can be found more in higher gross domestic product than in reduced consumption of energy. The drop in energy efficiency is mostly the result of reduced economic activity, but there must still be room to rationalize the consumption of all forms of energy, overall and by sector, at present levels of economic activity. The consumption of energy constantly increased between 1955 and 1990. However, the decline in economic activity reduced consumption between 1991 and 1997 when it fell below the 1990 level and even below the 1985 level for some forms of energy.

In the 1990s, this sector declined mainly because of the low price of electricity, which was considered a social good during the sanctions, because of the poverty of the population. The financial weakness of the energy sector resulted in technological backwardness and the poor maintenance of existing capacities. A final consequence was the increase in energy losses. The state of industrial power plants (quality, age, operating readiness, etc.) cannot be assessed because of the lack of data, but most boilers in industrial power stations use liquid fuels and are more than 15 years old. The state and efficiency of energy equipment are completely unknown, except for their total energy consumption. The different energy technologies used by households are well behind the developed countries.

Impact on the environment

The energy sector and the transport sector are the largest contributors to air pollution in the country (see also chapter 6, on air management and chapter 13, on transport). Compared to other countries, the emission figures per capita for sulphur dioxide and carbon dioxide emissions are high. Nitrogen oxide emissions are, on the other hand, very low per capita but not per unit of GDP. As investments in emission reduction equipment have more or less ceased and the monitoring and enforcement of emissions limits have not been successful, emissions from the energy sector have grown considerably during the past decade. (Table 11.1)

There was a decrease in air emissions in the early 1990s mainly because of the marked decline of the industry sector and a small decrease in transport. For the rest of the 1990s, air emissions increased much more than industrial output due to higher household consumption resulting from low prices and energy loss. Between 1991 and 1999, energy intensity rose from 0.56 to 0.78 koe/GDP.

New and renewable energy sources

Solar energy in Yugoslavia is a significant energy potential, but insufficiently used. Some areas, e.g. the Adriatic coast, have more than 2,000 h of sunny intervals per year. The research into and development of solar energy in Yugoslavia has produced some results, and there are several manufacturers of solar equipment. There are no statistical data on biomass in Yugoslavia, but it is estimated that its percentage of total primary energy production is 10%, and it is estimated that wood

Table 11.1: Pressures on the environment

Indicator	Unit	1991	1993	1995	1997	1998	1999
SO_X	kg/capita	43	38	44	49	49	n.a.
NO_X	kg/capita	5.5	5.2	5.6	6.2	6.2	n.a.
CO_2	ton/capita	3.6	2.9	2.9	0.0	0.0	n.a.
Energy use intensity	koe per unit of GDP	0.6	0.7	0.8	0.9	0.9	0.8
Minimum dissolved O_2 Danube River	mg/l	n.a.	n.a.	7.3	8.7	8.7	7.1
Maximum nitrates conc. Danube River	mg/l (N-NO3)	n.a.	n.a.	2.6	2.9	3.7	3.3
Maximum BOD	mg/l	n.a.	n.a.	5.2	4.9	7.8	20.0

Source: World Bank. Federal Republic of Yugoslavia. Breaking with the Past. The Path to Stability and Growth. Report No. 22267-YU. July 15, 2001.

volume presents a total energy potential of 72.5 Mtoe, i.e. its annual renewable potential is about 1.8 Mtoe. The total estimated energy potential of all types of waste (from biomass and industrial and municipal waste) is approximately 7.3 Mtoe. A start has been made on the experimental production of biodiesel from rapeseed, soybean and sunflower oil. Yugoslavia's estimated available hydropower potential is 27,032 GWh annually, of which about 46% are used. Wind power in Yugoslavia has been insufficiently researched. There are regions with a wind power potential of 1 to 2 MWh/m^2 suitable for wind generators as autonomous sources of electric power. Geothermal research in Yugoslavia is still undeveloped. According to some estimates and theoretical studies, Yugoslavia's geothermal potential is about 400 Mtoe.

Considering the significant positive effects of renewable sources of energy on employment, the reduction in fuel imports and the greater security of the energy supply, as well as local and regional development and environmental protection, their development and implementation are very important.

The policy framework

There is a development strategy for the energy supply industry to the year 2020. However, environmental impacts figure neither the legal nor the policy framework.

The legislative framework

Federal legislation for energy includes the 1978 Law on Affiliation to the Association of Yugoslav Electric Power Utilities, the 1995 Law on Prohibiting the Construction of Nuclear Power Plants, the 1997 Law on Pipeline Transport of Gaseous and Liquid Hydrocarbons and the 1998 Law on the Determination and Classification of Reserves of Raw Minerals and the Presentation of Geological Survey Results. The 1998 Federal Law on the Basic Principles of Environmental Protection also applies.

Institutional framework

The Federal Ministry of the Economy and Internal Trade is responsible for energy sources and the use of mineral resources. Energy production and distribution are the responsibility of power companies in the constituent republics. At the federal level, it is the Environment Department within the Federal Secretariat for Labour, Health and Social Care that is responsible for environmental protection.

International cooperation

Yugoslavia has received observer status in the Energy Charter process by signing the European Energy Charter, and it is active in a number of other regional and international energy-related activities. Yugoslavia recently assumed the presidency of the Southeast Europe Cooperation Process, where energy cooperation will play an important role.

11.2 Serbia

Energy production and use

The energy sector is one of the largest sectors of the Serbian economy. It consists of electric power, coal production, district heating and oil and gas production and import. The energy sector accounts for around 10% of GDP. The overall energy balance for Serbia for 2000 is shown in tables 11.2 and 11.3.

Table 11.2: Serbia: Primary energy production

in PJ

	Domestic	Import	Total
Total	420 (117 TWh)	160.5 (46 TWh)	580.5 (161 TWh)
Coal	280	12	292
Oil	40	91	131
Natural gas	20	58	78
Hydropower	40	..	40
Biomass	40	..	40

Sources:
Energy Sector Paper by Prof. Milovan Studovic, Republic of Serbia, Ministry of Mining and Energy.
Federal Republic of Yugoslavia. Federal Statistical Office. ECO Bulletin 1998.

Table 11.3: Final energy consumption by fuel and sector

Fuel	Total (TWh)
Total	102.4
Solid fuels	6.8
Liquid fuels	38.4
Gas	21.2
Electricity	36.0

Sector	Total (TWh)
Total	98.3
Industry	36.6
Transport	21.5
Residential	30.3
Others	9.9

Source: Energy Sector Paper by Prof. Milovan Studovic, Republic of Serbia, Ministry of Mining and Energy.

Both the current Spatial Plan for Serbia and national forecasts predict a slower growth in electric power consumption (around 1% every year) between 2000 and 2005 than between 1995 and 2000 (around 2% every year), due largely to increased electricity prices and the lack of production capacities. After 2005, however, consumption is expected to grow by more than 2% per year. In order to satisfy total electric power needs, new fossil-fuelled power and hydroelectric power plants have to be built. The average annual rise in petroleum and petroleum derivative consumption will be 2%, which assumes a corresponding rise in processing. Further growth is planned in the consumption of natural gas. This is expected to be satisfied from domestic production and imports. Available resources also allow a considerable rise in the use of new and renewable energy sources.

Energy sources

Conventional energy sources

Serbia's coal reserves, assessed at approximately 16 billion tons, are located in three coal basins: Kolubara, Kostolac, and Kosovo and Metohija. These coal reserves can be mined by surface mining methods, and they consist primarily of lignite. There are also eight small underground mines that produce brown coal. Annual coal production necessary for the regular supply of the power plants is 38 million tons. Coal production over the past ten years may be found in table 11.4 (see also chapter 8, on mineral resources).

Table 11.4: Serbia: Coal production

million tons

Coal basin	1990	1996	1997	1998	1999	2000
Total	35.0	29.8	33.2	34.5	29.8	33.2
Kolubara	29.1	24.1	26.8	27.2	24.1	26.8
Kostolac	5.0	5.0	5.7	6.7	5.0	5.7
Underground mines	0.9	0.7	0.7	0.6	0.7	0.7

Sources:
Federal Republic of Yugoslavia. Federal Statistical Office. ECO Bulletin 1998.
World Bank. Federal Republic of Yugoslavia. Breaking with the Past. The Path to Stability and Growth. Report No. 22267-YU. July 15, 2001.

Ten years of isolation, poor management, a lack of financial transparency, inflation, a backlog of land acquisition and minimal investment have led to major inefficiencies in coal mining, and urgent investments are needed to avoid a drop in lignite production.

Oil supply was disrupted by the bombing in 1999, when the refineries were damaged. About 70% of the capacity is in operation again. The natural gas sector was not damaged, but it has been poorly maintained and needs large investments.

Electricity production in Serbia is the responsibility of Electric Power of Serbia (EPS). In 1990, Serbia had a modern electric power system and also exported electricity to its neighbours. Yugoslavia's electricity production and consumption during the 1990s are shown in table 11.5.

Attractive domestic resources in the form of low-cost coal and hydroelectric potential account for almost all electricity production. Total installed generation capacity is around 7,500 MW, of which some 2,800 MW are hydropower plants in Serbia (excluding Kosovo and Metohija). Lignite-fired power plants account for 53% of installed capacity. During the year 2000, 62% of electricity came from lignite-fired power plants, 37% from hydropower plants, and 1% from combined heat and power (CHP) plants. The CHP plants use oil and gas as fuel and the relatively high cost of these fuels and difficulties in supply have reduced their use even though CHP plants are environmentally friendly.

The electricity sector has also been damaged both by the war and by a lack of maintenance, and has lost power capacity. As a result, electricity demand exceeds production. This is further exacerbated by low electricity prices, which generated a rapid growth in electricity demand during the 1990s. The lowest electricity prices are in the household sector, and electricity consumption by households during the past ten years has gradually risen from 42% in 1990 to almost 58% in 2000. At the same time, industry's share of consumption decreased from 51% in 1990 to 31% in 2000. The low energy prices have resulted in a much higher (in 2000, about 39%) per capita consumption of primary energy than would have been the case in a market economy with the same level of income per capita.

About 14% of all households in Serbia use district heating (DH) as the primary source of heating; 33% use electricity; 39% coal; 7% fuel wood and 7% natural gas. Because district heating plants have had difficulties in buying fuel, the heat delivered is sometimes insufficient for heating homes. Consequently, even those homes that are connected to the DH system need electricity for supplementary heating.

There are 43 cities and towns in Serbia that have DH systems, and installed capacity is approximately 6,600 MW. The most common heat source is from "heat-only boilers," which make up 47% of installed capacity. Co-generation plants make up 16%, and industrial boilers 10%. Most of the heat-only boilers are gas-fired. Fifty-six per cent of the fuel consumption is gas; 24% fuel oil and 20% coal.

An interesting project has been carried out in Belgrade, where 780 of about 1,200 local boiler stations have been connected to the district heating system and replaced by a substation. There are plans to connect the remaining local boiler stations as well and to extend the project to other small boilers where feasible. The project will decrease fuel consumption and air emissions.

Table 11.5: Yugoslavia: Electricity production and consumption

GWh

Year	1985	1990	1993	1994	1995	1996	1997	1998	1999*	2000*
Total electricity prod.	38,683	41,076	34,257	35,328	37,175	38,093	40,312	40,619	33,947	36,626
Consumption in power plants	2,185	..	2,394	2,400	..	..	2,657	2,624	1,893	2,249
Net	36,498	41,076	31,863	32,928	..	..	37,655	37,995	32,054	34,377
Consumption	26,811	..	26,756	27,259	..	..	32,137	31,923	27,230	31,222
Hydroenergy	11,276	9,599	10,115	11,272	12,331	14,673	12,860	..	..	..
Thermal energy	27,407	31,477	24,142	24,056	24,844	23,420	27,453	..	..	..

Source: Federal Republic of Yugoslavia. Federal Statistical Office. Statistical figures. 2001.
Note: * Without data for Kosovo and Metohija.

Consumption of electricity in industry

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
	14,888	12,671	9,148	8,674	9,683	12,634	12,390	12,261	10,832	10,066

The lack of maintenance of the district heating systems has resulted in large heat and hot water losses. Bad insulation of buildings is also a major source of heat loss. Between 20% and 40% of the heat supplied to an apartment could be saved by improving the insulation of walls, windows and doors. A third source of significant loss is the condition of the substations, which lack control and regulation equipment. It is estimated that up to 20% of total heat production is lost in the substations. Badly insulated and heavily corroded pipes are responsible for a further heat loss of between 15-20%. Finally, pipes that leak and that are not insulated cause losses of hot water and heat inside the buildings as well.

Renewable energy sources

Renewable energy sources like wind power or solar heating are not used in Serbia at the moment, although there are plans for demonstration projects. More renewable energy could be used, especially biofuels. About 7% of all households use firewood as their primary means of heating. It is possible to use wood waste from sawmills as fuel either as wet fuel or as briquettes and pellets in heating boilers instead of oil or coal. A demonstration project on briquette production started in 1994.

Geothermal energy is also available in Serbia and it is mainly used for hospitals and tourism in the spas. It is not suitable for electricity production, but could be used for heating.

The Spatial Plan for Serbia states that there should be considerably more use of renewable energy sources, that is, geothermal energy, biomass and cellulose waste from agriculture, biogas, solar, wind and municipal and industrial waste. At the moment, the use of all of these, with the exception of household firewood, is negligible.

Many households use their own electrical heating. For example, in Belgrade about 60% of households are not connected to the district heating network. There have been several public information programmes to persuade costumers to switch to another heating system. However, it is hard to find alternative fuels for space heating, and so electricity remains the most popular energy source.

Even though hydropower is considered a renewable energy source with minor environmental impacts, it does have some disadvantages, such as siltation and erosion of the dams and water systems and variations in water flows. The Danube River is the second largest European river after the Volga and has around 10,000 dams. The Iron Gate (at the Romanian border) is the single largest hydropower dam and reservoir system along the entire Danube. Siltation of the Iron Gates reservoir is of particular concern, with an estimated deposit of 20 million tons of sediment each year. Channels were dredged in the reservoir but have not been well maintained for lack of funding. Roughly 400 km upstream the river flows have slowed because of the choking effect of the sedimentation. In some areas, islands of high-quality soil have been formed with the topsoil blown away by the wind.

Between 1945 and 1990, Yugoslavia lost two thirds of its wooded area, and the problem is estimated to have worsened in the 1990s. The trees were used for heating when other primary sources became unavailable. Illegal cutting is a problem, but there are no exact data available. The removal of woods accelerates soil erosion, increasing deposits in the reservoirs of dams. It also increases the likelihood of floods and decreases the value of the hydro plants (see also chapter 9, on biodiversity).

The cooling water from the thermoelectric power plants should not be chemically or bacteriologically polluted, but gets very hot, which affects the thermal regime in the recipient body of water. Both the Nikola Tesla and Kostalac power plants use one-through cooling that increases the water temperature by 8-9° C, and river temperatures by roughly 3° C. The Government has imposed an upper limit of 28° C on the Sava River water temperatures, but these are periodically exceeded in the summer and, downstream from the plants, the River does not ice over, even during the most severe winter conditions.

The deposits of ash from all the thermoelectric power plants are located in the immediate vicinity of the waterway banks. Overflow from these deposits reaches the waterways, penetrates the soil and pollutes the groundwater, so that the inhabitants from surrounding settlements cannot use the local sources of water supply. Other untreated discharges from the thermal power plants also contribute to increased water pollution in the rivers.

Energy efficiency

Energy efficiency is generally poor in all sectors. The main reason for this is ignorance, the use of inefficient equipment and insufficient money for investment in modern (efficient) technology. When

the electricity price was increased in 2001, an information campaign on how to decrease electricity consumption was broadcast on TV and advertised in newspapers. There are large potential savings in all sectors. However, no significant energy efficiency programmes have yet been implemented in Serbia.

An energy efficiency agency is being planned within the framework of the draft energy law (see discussion under the legislative framework below).

Policy objectives and management

The policy framework

There is currently no energy strategy for Serbia. The draft energy law (see below) does refer to an energy strategy, stipulating that the strategy shall protect the environment in all energy activities.

The price of energy is part of the informal energy policy. As noted, prices were held down during the 1990s, and users paid far below cost levels. The price of household electricity is subsidized and covers only 20% of the cost of production. During 2001, prices were increased by more than 50%, but this is still short of full cost-recovery. Price increases have been postponed several times for social reasons.

The legislative framework

In addition to the Law on Environmental Protection, relevant laws also include the 1991 Law on Electric Power Utilities, with amendments; the 1991 Law on the Transport, Distribution and Use of Natural Gas, with amendments; the 1995 Law on Mines; the 1995 Law on Geological Survey; the 1995 Law on the Construction of Facilities; and the 1997 Law on Special Conditions for Granting Building Permits and Operating Permits for Certain Facilities.

Serbia's environmental legislation also includes the 1992 Regulations on Limit Values, Imission Measuring Methods, the Selection of Sample Spots Criteria and Data Collecting and the 1997 Regulations on Emission Limit Values, the Methods and Timeframe for Measuring and Data Noting.

Since 1992, few of the regulations on energy and the environment have been respected. This past decade of neglect has led to delays in investment in cleaner technology, ineffective monitoring of the environment and emissions, weaker enforcement and control and a very inefficient use of water and energy.

A new energy law is being prepared. The present Energy Law does not allow the structural changes required in the energy sector. Two of the most important aspects of the new law would be the establishment of both an energy regulatory agency and an energy efficiency agency. The former would regulate all energy activities. The main responsibilities of the latter would be to study the energy efficiency potential, conduct energy efficiency research and development, and plan and implement energy efficiency regulations and programmes. Overall, the objectives would be to establish a market-based legal framework and institutional regulatory infrastructure for an efficient and sustainable energy supply. The law would also take environmental protection into account.

Institutional framework

Serbia's Ministry of Energy and Mining is divided into three sectors: the Electricity Power Sector, the Geology and Mining Sector, and the Oil and Gas Sector. The responsibilities of the Ministry include tariffs, legislation (including the new energy law), strategies and policies for the energy sector. The Ministry also deals with questions concerning mining, geological investigation and exploitation of mineral resources (approval).

Energy production and distribution have been the responsibility of two companies, Electric Power Industry of Serbia (EPS) and Petroleum Industry of Serbia (NIS).

11.3 Montenegro

Energy production and use

Montenegro has been a net importer of electricity more or less constantly since the early 1970s, because of insufficient generation capacities. The deficit is compensated with electricity from Serbia's power system. To cover peak consumption, energy from the hydropower plant is used, but this is possible only during a small number of months and during hydrologically "good" years. Hydropower energy is also sent to Serbia in exchange for the energy supplied.

An annual increase in electricity demand of around 3% is expected during the 2002 – 2005 period (see

table 11.6). This is based on the assumption that there will be no major changes either in generation capacity or in the consumption structure.

As in Serbia, electricity consumption during the past ten years has gradually shifted to households and away from industry. Household consumption has increased by 85% over the past ten years, primarily because of an increased use of electrical heating and air conditioning. As in Serbia, energy consumption is disproportionate to the size of the economy and incomes.

Electricity prices are low and subsidized so that funds are not available for proper maintenance and investment. The Government of Montenegro has taken steps to raise the price of electricity, but, as with Serbia, higher energy prices have a significant social cost.

Increased electricity prices should serve as an incentive to reduce consumption, but will not be sufficient. It is important that energy price increases should be accompanied by information on energy-saving measures.

Energy sources

Conventional energy sources

There are two types of coal in Montenegro: dark lignite coal in the Pljevlja basin and brown coal in the Berane basin. The opencast Pljevlja mines supply about 80% of their coal to the nearby thermal power plant, and the rest is sold on the market. The mines are suffering from a decade of deterioration owing to a lack of investment in maintenance and spare parts and difficulties in acquiring new land. This has led to inefficient operations (see also chapter 8, on mineral resources management).

The oil and gas sector is currently limited to oil product distribution. There is exploration for gas, and it is likely that there are economic sources of gas offshore that in the near future could be used commercially.

The electric power industry of Montenegro is the responsibility of EPCG, the stock company "Electric Power of Montenegro". It is the only company in Montenegro involved in electricity generation, transmission and distribution. Total installed generation capacity in Montenegro is approximately 850 MW. Hydropower plants account for 75% of installed capacity and the thermal power plant Pljevlja for the remaining 25%. Some statistical figures regarding electricity generation are shown in table 11.7.

The present level of electricity consumption is 3.8 TWh per year, and peak demand is 650 MW. The largest consumer of electricity is the aluminium smelter plant (KAP) in Podgorica, which accounts for about 45% of gross demand. Electricity generation and consumption are shown in table 11.8.

Montenegro has had a constant deficit in electricity generation since 1980. The electricity balance for 2000 is shown in table 11.9. The electric energy deficit was 1.3 TWh, or 34% of total consumption. This means that Montenegro is largely dependent on imports. Electricity imports vary between 25 and 35% of total demand, depending on the availability of hydropower.

Much of the "imported" electricity comes from Serbia via EPS under a long-term contract, but electricity is also imported from neighbouring countries. The consumption structure is presented in table 11.10.

Table 11.6: Forecast electricity consumption in Montenegro, 2002-2005

TWh

Year	2002	2003	2004	2005
Industry	2.020	2.050	2.100	2.150
Traffic	0.045	0.045	0.045	0.050
Other	1.685	1.725	1.800	1.850
Net consumption	3.750	3.820	3.945	4.050
Transmission losses	0.147	0.150	0.155	0.160
Distribution losses	0.285	0.300	0.310	0.315
Gross consumption	4.183	4.270	4.410	4.525
Annual growth rate of consumption	2.2	2.1	3.3	2.6
Peak load (MW)	640	645	655	670

Source: Niksic. Get to know EPCG. November 1999.

Table 11.7: Electricity generation in Montenegro

TWh

Year	Total HPP	TPP Pljevlja	Total
1982	1.475	0.063	1.538
1986	1.874	1.002	2.876
1990	1.437	1.034	2.471
1994	1.475	0.523	1.998
1998	1.709	0.855	2.564

Source: Niksic. Get to know EPCG. November 1999.

Table 11.8: Electricity generation and consumption in Montenegro

Year	Generation	Consumption	Difference
1978	2.263	1.864	0.399
1982	1.538	2.759	-1.221
1986	2.876	3.406	-0.530
1990	2.471	3.372	-0.901
1994	1.998	2.145	-0.147
1998	2.564	3.543	-0.979

Source: Niksic. Get to know EPCG. November 1999.

Table 11.9: Electricity generation balance year 2000

TWh

Total	3.8
Thermal	1.0
Hydro	1.5
Import	1.3

Source: Niksic. Get to know EPCG. November 1999.

There is one thermal power plant in Montenegro. The plant consists of a 210 MW unit and was commissioned in 1982. The fuel is brown lignite from the nearby Pljevlja coal mine. The ash content of the coal is high, around 30%. The past ten years of neglect and lack of maintenance have left the thermal power plant in a very bad condition, and there is a great need for rehabilitation. The plant is equipped with electrostatic precipitators for dust removal, but the efficiency of the cleaning equipment is below requirements. The plant cannot comply with emission limits.

Montenegro has a relatively well-developed transmission and distribution network, considering the configuration of the terrain. The high-voltage transmission system is closely integrated with Serbia's and Bosnia and Herzegovina's transmission networks. As these systems are also in need of repair, it is important for Montenegro that these works should be carried out. The distribution systems have also deteriorated in the past ten years because of a lack of maintenance and load growth.

At the moment there are no district heating systems in Montenegro, but there is a plan to build such a system in Pljevlja, in the north. The Pljevlja thermal power plant would then be converted from a condensing plant into a CHP plant, and a distribution line would be built to the centre of Pljevlja.

Renewable energy sources

Very little use is made of renewable energy sources in Montenegro. By European standards, the use of solar power is low and reserved to heat production, mainly for hotels and buildings along the coast, where the climate is favourable. Biofuels are used mainly in the form of firewood. There are no wind power units.

Impact on the environment

Few figures are available on air emissions in Montenegro. Table 11.11 gives data for some emission sources in the Pljevlja district, which includes the thermal power plant. Figures are for 1997, and, since then, the cement plant has been closed down. It can clearly be seen that the thermal power plant, which has no cleaning equipment for sulphur dioxide emissions and requires major rehabilitation, is by far the biggest polluter. Emissions at the power plant stack are two to three times standard levels, and ambient air pollution exceeds limits approximately 20-fold. Pollution from the Pljevlja thermal power plant also contaminates the groundwater.

As in Serbia, the deposit of ash and other pollutants from the thermal power plant in Pljevlja threatens nearby waterways, soil and groundwater.

Energy efficiency

The level of energy efficiency in Montenegro is low. There have been no incentives for saving energy and there are no energy-saving programmes. Houses are built without any insulation. Much of Montenegro (but not the north) has a mild climate, which means that there is little need for heating. There is a need for cooling, however, during the summer season, and demand for this is growing. The largest energy savings may be found in improvements to electricity use and the insulation of buildings. The population is relatively ignorant about energy efficiency and about the link between energy production and environmental issues.

Table 11.10: Consumption structure

TWh

Year	Direct consumers	Traffic (railways)	Households	Other	Losses	Total
1978	1.074	0.016	..	0.595	0.179	1.864
1982	1.625	0.024	0.441	0.433	0.236	2.759
1986	2.066	0.032	0.466	0.538	0.306	3.406
1990	1.969	0.042	0.534	0.500	0.327	3.372
1994	0.485	0.022	0.787	0.435	0.416	2.145
1996	1.204	0.030	0.919	0.516	0.462	3.131
1998	1.551	0.030	0.940	0.486	0.536	3.543

Source: Niksic. Get to know EPCG. November 1999.

Table 11.11: Air emissions in the Pljevlja district

ton/year

	Fuel (oil)	Fuel (coal)	SO_2	NO_X	Dust	CO	CH
TPP Pljevlja	..	1,488,000	28	13	4	787	134
TPP Pljevlja	7,500	..	282	94	7	36	3
Forestry combinat	..	76	1	672	154	17	7
Small boiler plants	..	48	654	427	427	11	4
Cement plant	6	78	1	694	8	18	7

Source: Company Rudnik Uglja "Pljevlja". Figures for 1997.

Policy objectives and management

The policy framework

There is no overall energy policy or strategy, and no policy that integrates the environment into energy planning. There are no immediate plans for the privatization of the energy sector, but future plans include splitting EPCG into separate units and privatizing the different parts.

The legislative framework

Energy-related legislation includes the 1990 Law on Energy, the 1993 Law on Geological Survey, and the 1993 Law on Mining. In addition, in 1991 Montenegro declared itself an Ecological State. But putting this into practice is proving difficult. Montenegro is at the moment working on a new energy law that will be harmonized with European Union legislation. The idea is to create a free market for energy. The new law is expected to be ready by 2002-2003.

The institutional framework

The energy sector, together with mining and industry, is one of the responsibilities of the Ministry of the Economy.

11.4 Conclusions and Recommendations

Recommendations to the Federal Government, Serbia and Montenegro

In 1997 the Federal Government adopted "The Strategy for the Development of the Energy Supply Industry to the year 2020" and it made it operational through several studies and programmes, inter alia, the Programme of measures of efficient use of energy in Yugoslavia and the Programme of Development of New and Renewable Sources of Energy, particularly in agriculture. Through the energy efficiency programme, the Strategy introduces two categories of measures for improving energy efficiency: organizational and operational measures, and technological and technical measures, which should be implemented in all energy sectors: production, conversion, distribution and consumption.

Recommendation 11.1:
*The **Federal Ministry** of Economy and Internal Trade and the relevant authorities of the two republics should:*

(a) *Update the existing Strategy for the Development of the Energy Supply Industry and*

develop action plans and programmes to improve energy efficiency and integrate environmental principles in the energy sector; and

(b) *Promote and implement a legislative framework and develop an institutional framework to facilitate implementation.*

Recommendations to Serbia and to Montenegro

Although the environmental impact decreased during the past decade, especially at the beginning of the 1990s, because of the decrease in energy demand and production, low energy prices and other factors have again increased the pollution level back to where it was before the sanctions were imposed. This is one symptom of a lack of policies and programmes to support energy efficiency. The current subsidies for electricity, gas and district heating prices, especially for households, have a negative effect on energy savings.

At the same time, it is clear that segments of the population may not be able to afford the real cost of electricity, gas or district heating, and it is important that the poorest people are protected from the effects of energy price increases. Most of the population, however, can afford higher energy prices and reducing energy use would save money. Higher energy prices will also reduce demand on the overloaded electric power system and reduce consumption of imported oil and gas products. Increased tariffs would also strengthen the financial situation of the energy generation companies, which means that they can start to invest in rehabilitation and efficiency measures that have been very limited the past decade.

Recommendation 11.2:
***Serbia**'s Ministry of Energy and Mining and **Montenegro**'s Ministry of Economy should end all subsidies of energy prices. The electricity companies should be allowed to set prices to reflect the real economic costs. Targeted support for vulnerable users should be included as part of the tariff reform.*

Increasing energy prices will not by itself reduce energy consumption. Enforcement is also necessary. Production companies need to have the power to disconnect customers who do not pay their bills. This, however, is only the second-best solution. It is far preferable to provide consumers with easily available information on energy-saving measures. This could be done through different kinds of campaigns and by involving the educational system. A few energy efficiency campaigns have already been carried out. They need to be continued.

Recommendation 11.3:
***Serbia**'s Ministry of Energy and Mining, together with the energy efficiency agency (once established), and **Montenegro**'s Ministry of the Economy, together with the electricity company, should start broad-based public information campaigns to publicize energy-saving and energy-efficiency measures.*

It is the responsibility of the Ministry of Energy and Mining in Serbia and the Ministry of the Economy in Montenegro to introduce new tariffs, prepare new energy laws, introduce new regulatory frameworks, restructure the energy sector and start its privatization. These are major changes, and they will require considerable work from both the ministries and the energy companies.

In both Serbia and Montenegro, new energy laws are being drafted, but they have not yet been finalized. To be able to start restructuring the energy sector it is necessary to adopt the new laws.

Recommendation 11.4:
***Serbia**'s Ministry of Energy and Mining and **Montenegro**'s Ministry of the Economy should begin the restructuring of their energy sectors as soon as their national assemblies adopt the new energy laws.*

*In **Serbia**, the Ministry of Energy and Mining should establish an energy efficiency agency and ensure that it receives sufficient resources to develop and implement the approved energy policies and strategies*.

There are many examples of energy- and electricity-saving measures. Labelling and standards for household appliances (e.g. refrigerators, freezers, washing machines) are common in most EU countries, but these have not so far been applied in Yugoslavia. Labelling and standards both improve the efficiency of the appliances and inform consumers about the product so that they may choose to buy the most efficient equipment.

Recommendation 11.5:
***Serbia**'s Ministry of Energy and Mining, together with the energy efficiency agency (once established), and **Montenegro**'s Ministry of the Economy should introduce a standards and labelling system for household appliances to decrease electricity consumption.*

Since there has been little new investment and a severe lack of maintenance during the past ten years, emission reduction units in the thermal power plants have deteriorated. The result is that the filters are inefficient, and the emissions overshoot limits. The increased emissions cause problems for the people living near the power plants and also pose a threat to other persons and to nature. It is extremely important to improve the efficiencies of the precipitators so that existing (and future emission limits according to EU norms) can be met. If the generation plants do not comply with the limits they should pay a fee. To control compliance, monitoring should be more frequent. The rehabilitation of cleaning equipment should be followed by a total rehabilitation of the plants to a standard that will guarantee efficient and stable operation.

Recommendation 11.6:
***Serbia**'s Ministry of Energy and Mining, together with the energy efficiency agency (once established) and **Montenegro**'s Ministry of the Economy, in cooperation with the management of the thermal power plants, should:*

(a) *Rehabilitate the thermal power plants to a state where they can operate within emission limits, as a matter of priority;*

(b) *Provide the necessary financial resources for this purpose, through increased tariffs and governmental funding; and*

(c) *Introduce a fee system guaranteeing the limits and forcing the production plants to comply with them.*

Recommendations to Serbia

Combined heat and power (CHP) production is one of the most efficient ways of producing energy. Large energy-efficiency improvements can be made by implementing CHP in district heating plants. The current low level of CHP production is mainly due to the fact that these plants use fossil fuels other than coal, and these are more expensive since they must be bought on the open market.

Operating existing CHP plants would considerably reduce the combined fuel consumption of the heat and power systems. To increase the use of CHP it is important to withdraw all existing obstacles for the small electricity producers and to open up the market to them. It is important, for instance, to have access to the public electricity grid and appropriate legislation, including tariffs.

There is also a potential within Serbia for using more renewable energy sources.

Recommendation 11.7:
The Ministry of Energy and Mining, through the energy efficiency agency, should:

(a) Work toward increasing the share of co-generation. Natural gas should be used as a fuel. The Ministry should also remove existing market barriers for the heating companies to deliver electricity to the grid; and

(b) Begin now to develop a strategy on how to overcome the constraints on renewable energy sources and to begin an implementation programme on the basis of this strategy. The implementation programme should include demonstration projects and create favourable conditions for new or existing production units using renewable energy sources, e.g. priority in production, a smoother approval process, attractive tariffs, investment support.

The district heating networks are old, worn out and designed according to obsolete design criteria, resulting in a large reserve capacity. This leads to very high energy consumption in the system. In the future, when they are rehabilitated, the plants should be designed for the appropriate capacity and incorporate other energy-saving measures. They should also use more modest design criteria for peak load duration, thereby decreasing the overcapacity of the systems. This will lead to a reduction in energy consumption, and the whole system could be smaller, decreasing investment costs.

The Belgrade project to connect local boiler stations to the district heating system is positive for the environment, since it will decrease fuel consumption and emissions. To date, only 65% of

the planned connections have been completed, and there are plans to extend the project when feasible.

Recommendation 11.8:
The Ministry of Energy and Mining, in cooperation with the municipalities, should rehabilitate district heating plants in line with modern heating concepts, adjusting the capacities of all components to energy demand estimated after implementation of energy-saving measures.

Recommendations to Montenegro

There is a potential within Montenegro for using more renewable energy sources, especially biofuels and solar heating. Many households use firewood for heating. It is also possible to use wood waste from sawmills as either wet fuel or as briquettes and pellets. The briquettes and pellets should be used in heating boilers instead of oil or coal. The northern parts of Montenegro are covered with woods, and the wood-processing industry is quite large. Its by-products, e.g. sawdust and shavings, are excellent raw material for the production of pellets.

There is considerable research into solar heating technology, resulting in increasingly efficient solar heating panels. Solar radiation in Montenegro is more than sufficient to begin demonstration projects.

Recommendation 11.9:
(a) The Ministry of the Economy should develop and implement a strategy and an action plan for the use of renewable energy sources, and it should begin to develop demonstration projects for solar energy.
(b) The Ministry of the Economy, in cooperation with the Ministry of Tourism, may wish to consider establishing the first demonstration projects in high-volume areas, such as in the tourist areas along the coast, where demand for air conditioning peaks.

Chapter 12

AGRICULTURE AND THE ENVIRONMENT

12.1 Introduction

Agricultural production in Yugoslavia was not fully collectivized or nationalized as in other socialist countries. The main production capacity was and still is in the hands of private farmers, mostly with very small farms. All restrictions on landownership and transfers were abolished in 1986, but earlier restrictions on the maximum size of private farms (originally 20 ha and later 10 ha) still have an impact. There are also some 460 larger State-owned and 400 "socially owned" farms, mainly in Serbia, with large-scale animal and crop production. The private sector accounts for approximately 80% of agricultural output, but socially owned farms have a strong position in marketing and processing.

Private farms were members of cooperatives or *zadruga*, which played a role in bringing agricultural products to the market and in supplying inputs. The *zadruga* activities were strongly influenced by the State, but the cooperatives are now trying to carve out a role in a new environment.

Serbia, in particular, was a well-known exporter of meat, vegetables and fruit, but because of international sanctions and the wars, exports ceased and production declined by 20% in the 1990s. However, as other sectors fared even worse, the relative share of agriculture in GDP increased from 16.8% in 1990 to 21.9% in 2000.

During the 1990s the use of agricultural inputs decreased dramatically as both supply and demand fell. The use of fertilizers decreased 73% between 1990 and 2000. The use of pesticides fell 78%. The decrease was even more dramatic in private than in State- and socially owned production.

12.2 Yugoslavia

The federal bodies responsible for agriculture are: the Federal Ministry of the Economy and Internal Trade (the economic system, development and transition, the status of enterprises, geodetic network and mapping) and the Environment Department of the Federal Secretariat for Labour, Health and Social Care (some environmental aspects of agricultural production). A number of federal laws affecting agriculture are, for example, the 1998 Federal Law on the Basic Principles of Environmental Protection, the 1998 Federal Law on Water Regime, the 1998 Federal Law on Admission of Agricultural and Forest Plant Varieties, the 2000 Federal Law on Organic Agriculture, the 2000 Federal Law on Protection of Agricultural and Forest Plant Varieties, and the 2001 Federal Law on Genetically Modified Organisms (GMOs).

Serbia and Montenegro today face a common challenge. As agriculture is declining in importance for the Federation, each republic will have to develop its own legal and institutional structure for agriculture. This challenge is substantial as Yugoslavia intends to apply for EU membership.

The natural conditions, traditions and scope of agriculture differ considerably between the two republics. The remainder of this chapter will be divided into a section on Serbia with its more developed agriculture, and a section on Montenegro. In 1999 Serbia produced almost 80% of Yugoslavia's total agricultural production.

12.3 Serbia

Background

Geographical areas and climate

Agricultural regions in Serbia are very diverse, but generally have climatic conditions favourable to agriculture. Serbia can be divided into three major regions: Vojvodina, a large area in the north containing fertile plains drained by the Danube and other rivers; central Serbia, a hilly and densely populated area with the Morava River basin as a particularly fertile region; and Kosovo, a mountainous area in the south. In central Serbia and Kosovo the soils are often relatively poor.

Organization of production and general trends

Private farms, with 80% of agricultural land and 80-90% of livestock, are generally very small, on average less than 3 ha. Many of the small farms are farmed mainly for subsistence. The consolidation of farms is a prerequisite for the development of a more efficient and market-oriented agriculture, but the land market does not yet function very well.

The State-owned and socially owned farms are considerably larger and often more efficient and productive. Many of these farms are found in Vojvodina. Some 250,000 ha of agricultural land was restored to private owners in 1991, and the privatization of socially owned farms is being prepared. The State- and socially owned farms are frequently insolvent.

Agricultural production in Serbia has declined considerably over the past 10 years. In addition to the effects of sanctions and wars, floods and droughts have contributed to a decline in the late 1990s. However, there are indications that the trend has reversed. In 2001 agricultural production increased by as much as 25%, to some extent due to good weather conditions.

The lack of capital with its consequent low level of mechanization and worn-out machinery, and low agricultural inputs also hinder agricultural productivity. As a result the productivity in crop and animal production is considerably lower than in Western Europe.

The situation in private as well as State- and socially owned sectors makes it likely that significant structural changes will take place in Serbian agriculture during the years to come.

Crop production

While large-scale production of cereals and industrial crops (sunflower, soybeans and sugar beet) dominate in Vojvodina, vegetables, fruits, berries and forage crops are more important in central Serbia. Yields are low at present, but are expected to increase with an increased use of fertilizers and pesticides (see table 12.1).

Irrigation installations are found on 197,000 ha, but it is estimated that only a third or fewer of them are used annually. One reason is the lack of maintenance. Irrigation is more widespread in Vojvodina (97,000 ha) and Kosovo (75,000 ha) than in central Serbia. Drainage is also an important factor for crop production, and this is not adequate in some regions (see below).

Animal production

Livestock numbers (see table 12.1) and animal production have decreased by 30% during the past 10 years. Swine stocks, however, are stable. The main explanation is decreased demand for the more expensive animal products, but a shortage of animal feed and adequate veterinary services may also have played a role.

The best opportunities are in the production of milk, beef and pork, but productivity is low. At present milk prices for consumers and animal breeding are being subsidized.

Rural development

Half of the population lives in rural areas, but only some 8% of rural households get all their income from farming. In particular in remote and mountainous areas the population is declining and ageing, and the young people remaining in the countryside are frequently unemployed. Especially in those parts of Serbia where commuting is possible, members of farming households often work at least part-time in off-farm employment.

There are considerable inequalities in regional development, with large rural areas lacking infrastructure and social development. The basic goals of the regional development policy are gradually to decrease regional disparities; prevent the further backsliding of underdeveloped areas such as southern Serbia; halt negative migration flows; and prevent the unplanned and irrational use of land.

Environmental concerns in agriculture

Even though there is limited information available, it can be concluded that the environmental pressure from agricultural production is not very high at present. The situation, however, is likely to change rapidly with the increasing use of inputs. Since new policies in the sector are being prepared, it is now a good opportunity to introduce policy elements that would contribute to a more efficient agriculture with fewer negative effects on the environment.

Table 12.1: Crop and animal production in Yugoslavia

	Yugoslavia	Serbia (excl. Kosovo and Metohija)	Central Serbia	Vojvodina	Montenegro
Agricultural area (ha,2000)	5,627,000	5,109,177	3,321,721	1,787,456	
Cultivable area (ha, 2000)	4,445,000	4,258,717	2,613,612	1,645,105	517,585
Arable land (ha, 2000)	3,406,000	3,356,484	1,775,605	1,580,879	186,102
Orchards (ha, 2000)	255,000	244,639	227,416	17,223	10,585
Vineyards (ha, 2000)	75,000	70,634	58,765	11,869	3,739
Meadows (ha, 2000)	708,000	586,960	551,826	35,134	119,277
Pasture (ha, 2000)	1,143,000	815,379	703,462	111,917	326,991
Sown area (ha,2000)	3,214,000	3,178,374	1,664,183	1,514,191	..
Cereals (ha,2000)	2,057,000	2,047,741	1,022,863	1,024,878	..
Wheat (ha, 2000)	653,000	651,197	317,704	333,493	..
Maize (ha, 2000)	1,220,000	1,216,607	586,685	616,259	..
Industrial crops (ha, 2000)	363,000	363,216	36,666	326,550	..
Vegetable crops (ha, 2000)	313,000	295,091	210,393	84,698	..
Fodder crops	480,000	472,326	394,261	78,085	..
Fallows and uncultivated arable fields	189,000	175,258	109,393	65,865	..
Cattle (head, 15.01.01)	1,452,000	1,272,000	1,050,000	223,000	179,071
Cows (head, 15.01.01)	933,000	843,000	738,000	105,000	121,060
Cows, milk yield (litres, 2000)	2,063	1,857	1,714	2,876	..
Pigs (head, 15.01.01)	4,087,000	4,066,000	2,376,000	1,530,000	19,266
Sheep (head, 15.01.01)	1,917,000	1,611,000	1,463,000	148,000	293,197
Hen (head, 15.01.01)	21,118,000	20,372,000	12,499,000	7,022,000	790,577

Source: Statistical Yearbook on Yugoslavia 2001.
Note: Data for Kosovo not available.

Erosion and soil contamination

In the hilly parts of Serbia in particular, sound agricultural practices are essential to minimize water erosion. Wind erosion is also a threat on the Vojvodina plains. As much as 80% of agricultural land is in danger of erosion and according to earlier estimates about 25% of Serbian land is exposed to levels of erosion that range from high to extreme. Small farms and plots, and the low pressure from grazing animals decrease the pressure of erosion on agricultural land. However, changes in the intensity and structure of agricultural production could rapidly worsen the situation.

Only individual cases of soil contamination are found in the investigations by Serbian scientists. An exception is copper contamination in vineyards, a common phenomenon caused by the fungicides used.

Conservation of landscapes, biotopes and biodiversity

The traditional rural landscape in Serbia has a considerable cultural, historic and biodiversity value. As the structure of its agriculture is likely to change dramatically over the next decade or two, it would be appropriate at this time to define which components of the landscape should be preserved for the future. The same is true for landraces of crop plants and domestic animals.

One particular biodiversity issue is the preservation of wetlands. The main threat of agriculture to biodiversity is often thought to be the extensive drainage of wetlands, but little information is available as to whether this is indeed the case. It is not likely that risks are great in the short term.

Irrigation and drainage

Irrigation and drainage are both important factors for efficient farming but they can also influence the environment negatively.

Both crop production and water available for developing irrigation could be increased. At least the available installations should be rehabilitated and used more efficiently. Plans for the rehabilitation or construction of new irrigation installations must take into consideration possible environmental risks. A matter of concern is to what extent irrigation contributes to soil deterioration, for

example in Vojvodina. There are conflicting views as to whether this is a major problem.

The lack of maintenance of drainage installations has caused serious floods recently in Vojvodina and northern Serbia. Properly working drainage systems increase production and decrease the risk of floods. On the other hand, wetlands are an important element in the landscape for the preservation of biotopes and biodiversity and for decreasing nutrient run-off.

Use of fertilizers and pesticides

The run-off of fertilizers and pesticides from the fields is likely to be insignificant because they are little used. This is confirmed by the insignificant concentrations of pesticides found in the ambient environment. The use of chemicals is likely to increase very soon and the challenge will be to develop policies to minimize run-off risks.

Yugoslavia has its own pesticide registration procedure, which is relatively close to the EU procedure. Even if some old (and cheap) pesticides are used more than in Western Europe this is not a reason for serious environmental concern. Some old pesticide stocks await destruction (e.g. Nitrofen) but the quantities do not seem to be too alarming.

The problem is that pesticide sprayers are outdated and cannot ensure the even distribution of the active substance. This is probably also true of machinery for spreading fertilizers. Farmers using pesticides frequently do not use any protection equipment and do not have relevant training. It is very important to make sure that farmers apply pesticides in correct doses with efficient sprayers, and wear protection clothing. According to regulations, pesticide sprayers should be controlled regularly, but it seems that these regulations are not always applied.

Low soil pH is a problem; as much as 22% of agricultural land has a pH below 4.5. This is mainly due to natural soil and climatic conditions, but the use of acidifying fertilizers is a contributing factor. Acid rain may also contribute.

Animal production

Manure handling needs to be improved. Even small producers tend to store manure on the field a long time before spreading it, and this increases the risk of run-off of nutrients and other substances.

The most serious problems are caused by a number of very large pig farms. In these pig farms the manure ends up in large ponds with a considerable risk of water and groundwater contamination. Privatization of these farms is under way. These pig farms are subject to permitting for production, but the procedure apparently has been a mere formality. Pig farms are not subject to regular environmental inspection.

Negative effects on agriculture caused by other sectors

There are some reports of oil contamination of fields and the destruction of farms as a result of bombing in 1999, but the main damage to agriculture caused by the war was in the input and process industry. Fertilizer and fuel supplies were seriously restricted by the bombing.

Mining activities have degraded about 25,000 ha of land, but it is not clear how much of this is agricultural land. High groundwater table levels seem to be a more serious problem in the Banat region due to the Lake Djerdap water reservoir.

Policy objectives and management

The policy framework

After the rapid political changes and re-establishment of contacts with the international community during the past couple of years, the old system is no longer relevant but new policies have not yet been put into place. There is no clear understanding of how environmental policies will be applied in the agricultural sector. Environmental concerns may play a more prominent role in agriculture in the future, as policy statements by the Serbian Government are stressing.

The overall objective of the present Government's agricultural policy is to promote the development of commercially oriented, liberalized agricultural production and trade integrated with world markets. Most of the price controls have been removed, which has resulted in higher product prices.

Serbia aims to reduce areas under cereals and increase the cultivation of industrial crops. It also intends to increase acreages for vegetable and fodder crops, as well as to rehabilitate and expand fruit, berry and viniculture production. The development of irrigation is seen as an important tool for improving the efficiency of production.

Increasing the production of high-quality beef, lamb and pork is yet another priority.

Harmonization with EC regulations and policies is a central theme in the longer-term plans, but no decisive steps have yet been taken to implement EC directives in the agricultural sector. The European Agency for Reconstruction (EAR) is involved in developing a policy framework and new legislation. A new master plan for the agricultural sector will be drawn up in collaboration with EU experts during 2002.

Further privatization of agricultural land is planned. Complete privatization of the large-scale agricultural production units awaits the resolution of issues relating to landownership. There are also plans to privatize irrigation and drainage installations in the longer term.

The legislative framework

The 1992 Law on Agricultural Land regulates the protection and use of agricultural soil, financing for their protection, use, improvement and supervision; there are regulations for soil testing and the application of fertilisers in socially owned and State farms. Most of these issues must be covered in the legal framework, but due to the reform of the economy and approximation to the EU, the Government aims to draft new laws and regulations.

In this process it is usually an advantage to use an integrated approach. In general, it is better to consider environmental concerns in preparing the mainstream regulation and policy framework on agriculture, rather than focusing on restrictions motivated by specific environmental concerns. For example, input and price support policies may be as important for the environment as, for example, specific rules on the application of pesticides.

Economic instruments

Regulations governing farm prices for some of the products, and the problems caused by the wars and international sanctions, have contributed to serious economic pressure on agriculture and low incentives for producers over the past decade.

The Government intends to remove State involvement in input supply, which is still supported, agricultural inputs being exempt from taxes. Some targeted direct subsidies to rehabilitate livestock production, and for milk, tobacco and sugar beet are being discussed.

The institutional framework

The Ministry of Agriculture and Water Management is responsible for agricultural policies, and the use and protection of water resources. The Ministry is divided into three departments: agriculture, veterinary and water management. Most of the staff work as inspectors out of 25 regional offices.

The role of the Ministry is being reviewed. A clear definition of government responsibilities in agriculture is an important part of this review. It has already been decided that financial institutions serving agriculture should be independent. Extension, research and veterinary services are examples of other areas where the Ministry decides future reform and strengthening.

Cooperation between the former Ministry for Health and Environmental Protection and the Ministry of Agriculture and Water Management functioned well informally, for example in connection with the preparation of the draft law on the environmental protection system. However, there are no formal links between them on policy-making in agriculture and the environment.

The organization responsible for irrigation and drainage networks is the “Srbijavode” water authority with some 600 employees.

Agricultural research and education are well developed in Serbia, but they have mainly focused on the needs of the large farms rather than on the majority of small, private farms. The same is true of the extension services, even if there are attempts to change this focus.

There are numerous research institutions in the agricultural sector, the largest being the Agricultural Research Institute – Serbia. Research is characterized by a division into traditional academic subjects. Present research funding is very meagre. The education of agricultural experts and farmers takes place in five agricultural faculties, the largest in Belgrade and in Novi Sad, where programmes are traditional with a focus on output maximization.

The Institute for Applied Research in Agriculture is responsible for agriculture extension and has 33

regional offices in addition to the centre in Belgrade. It has little funding but a broad mandate. There are systems available for estimating nitrogen reserves in the fields as well as for integrated crop protection management, but its focus is rather a maximization of output than the sustainability of agriculture. Extension services have mainly been used for the larger, socially owned farms, but are also to some extent available for smaller private farms.

Environmental awareness of farmers and organic farming

There is a certain awareness and even pride in Serbian agriculture that food production is "clean". However, activities aimed at raising the awareness of farmers about environmental protection are very restricted. Locally the farmers' cooperatives play a role in cleaning drainage canals and planting trees.

The Federal Law on Organic Agriculture (No. 28/2000) provides a good basis for the development of organic farming and food labelling. A few initiatives have been taken to develop production and donors seem to be interested in supporting this process. However, there are several issues that have to be resolved before organic farming can become a major factor. It will for example take some time to create a Serbian market for environmentally labelled products, and developing foreign markets for organic products from Serbia will require considerable efforts.

12.4 Montenegro

Background

Geographical areas and climate

Montenegro can be divided into three geographical regions: the coastal region, the central plains and the interior highlands. The coastal zone has a typical Mediterranean climate while the interior is more continental. Along the coast karst formations dominate, while more acid soils predominate in the inner highlands. Precipitation is very high in some areas (up to 4,800 mm in the mountains close to the coast) but considerably lower (800 mm) in the interior. Only about 5% of the surface area is flat, and most of it is around Podgorica, the Zeta plains.

Organization of production

Agriculture is not a developed sector, and most foodstuffs come from Serbia or are imported from other countries. The capacity of the food-processing industry is a severe hindrance to the development of agriculture.

Agricultural production is almost exclusively in private hands. There are a few large farms, a State farm in Niksic and the major wine-producer, which is socially owned. Preparations are under way to privatize the State farm.

Subsistence farming is more the rule than the exception in Montenegrin agriculture, even if production has increased by some 5% annually over the past few years. The average farm has about 5 ha, 80% of which is meadows and pasture, and the farms are found in many small, frequently poor, villages. It is not unusual for farmers to move in the spring with their animals from the lowland to farms in the highlands, where pasture is more abundant in the summertime.

Extensive animal production is the main focus in the interior highlands, while crop and orchard production is more developed in the coastal region and the central plain.

Crop and animal production

Thirty-seven per cent of all land in Montenegro is agricultural. A large proportion is pasture, mainly in the interior highlands, while arable land covers only 186,000 ha (see table 12.1).

The Zeta plains are not used very intensively, as the soil is heavy and compacted. Drainage could improve the situation, and irrigation would increase its potential for use in large-scale agriculture.

Wheat, barley and maize cover most of the arable land. The production of apples, pears, plums, citrus fruits, peaches and other fruits further play an important role. Plum production in the highlands has declined due to plant diseases, which are also partly responsible for the decline in olive production in the coastal region. Potatoes, cabbages, watermelons, tomatoes and peppers are important vegetables. Of the total 4000 ha of vineyards, a socially owned wine-producing company cultivates almost half of the acreage close to Podgorica. Irrigation is not widespread despite its potentially positive effect on crop production in some parts of Montenegro as well as good access to water from the mountains.

Even where agriculture is focused on animal production, production is generally extensive and

small-scale. The biggest private milk producer has only 22 cows. Livestock numbers decreased during the 1990s, mainly due to a lower demand for the more expensive animal products. However, at present livestock numbers are increasing (see table 12.1).

Environmental concerns in agriculture

The environmental pressure from agricultural production is limited at present, but it is likely to increase with intensified production. As new policies in the sector are being developed, it would be timely to introduce approaches that would contribute to a more efficient agriculture with fewer negative effects on the environment.

Erosion and land use

Because of the steep mountains, water erosion is the main potential problem for agriculture. It is clear that agricultural practices are a key factor in sustainable land management. The main risk of increased erosion comes from possible overgrazing (see below) but also from more intensive arable crop production. The generally small land holdings of private farmers, the small plots, and terracing of land, reduce the risk of erosion. In the future, if structural changes were to lead to larger farms and plots, erosion risks might increase considerably.

Conservation of biodiversity and landscapes

There are plans to lower the water level in Skadarsko Jezero, one objective being to increase the acreage of agricultural land by some 14,000 ha. The harm to the preservation of biodiversity in the lake is likely to be dramatic. This project is linked to plans in Albania to construct a hydropower station on the River Drim.

The traditional rural landscape in Montenegro has considerable cultural, historic and biodiversity value. As the structure of agriculture might change considerably in the immediate future, it is appropriate at this time to decide which components of the agricultural landscape should be preserved for the future. The same reasoning is valid for landraces of domestic animals and crop plants (see chapter 9 on biodiversity conservation and nature protection).

Use of fertilizers and pesticides

The low run-off of fertilizers and pesticides from the fields seems to be due to restricted use. The use of inputs is likely to increase, and the challenge will be to develop policies that would minimize run-off risk.

Pesticide sprayers are outdated and cannot ensure the even distribution of the active substance. This is probably also true of machinery for spreading fertilizers. Farmers using pesticides frequently do not use any protection equipment and do not have relevant training. It is very important to make sure that farmers apply pesticides in correct doses with efficient sprayers, and wear protection clothing.

The approval system for pesticides and other chemicals is weak in Montenegro, and is based mainly on the old Yugoslav system. There are valuable contacts with stronger institutions in Serbia for the testing and approval of pesticides.

Animal production

There is only one very large pig farm in Montenegro; otherwise herds of swine, cattle and sheep are small or very small. Manure is often stored in the field before spreading, which leads to run-off of nutrients and other substances. The manure handling system of the large pig farm might cause serious point-source pollution.

Overgrazing is not an acute problem. However, as the risk of water erosion are very high in a large part of Montenegro, a policy that would increase animal herds significantly and intensify animal production could be very negative.

Policy objectives and management

The Ministry of Agriculture, Forestry and Water Management is strongly committed to establishing policies promoting an environmentally friendly agriculture. This is reflected in its considerable interest in developing “organic” or “healthy food” production on the basis of the extensive, low-input production that characterizes Montenegrin agriculture. So far this interest has not materialized in specific policies or plans.

The policy and legislative framework and economic instruments

The focus of agricultural policy is to support the development of market-oriented private farms. A more profitable agriculture is seen as a basis for rural development in Montenegro. Animal, vegetable and fruit production are priorities.

The policy aims to increase production, not for export (except for specific products such as wine and honey) but rather to make it possible to decrease import needs and feed the tourists.

EC regulations and policies are the most important guidelines for longer-term policy-making. The European Agency for Reconstruction is planning projects for capacity building in institutions responsible for approximation to the EU. So far EAR support has been mainly aimed at developing production, for example in the dairy sector. Bilateral projects in the agricultural sector support different orientations for animal (milk, beef, pork) and crop production (potato, vegetables in glasshouses).

With this background the legal framework of Montenegro's agricultural sector will have to be reformed. Only marginal steps have been taken so far in this direction.

One of the main tools for implementing agricultural policy is support for increasing animal herds, which is given mainly to farmers increasing their herds of sheep, goats and cattle. Under this support scheme, farmers in poorer regions receive more support per animal. In addition, seed material is subsidized, and attention is given to the countryside infrastructure.

As in Serbia, the Government seems at this stage to be ready to develop an integrated approach, to consider environmental concerns in the development of agricultural policy. For example, any proposed input and price support policies should be carefully analysed from an environmental point of view too.

The institutional framework

The Ministry of Agriculture, Forestry and Water Management is responsible for managing the agricultural and forest sectors as well as soil, water and forest resources. It is divided into four departments: agriculture, forestry, water management, and veterinary services. Each of these departments has an inspectorate.

The recent establishment of an inter-ministerial working group on rural development and the environment by the Ministry of Agriculture, Forestry and Water Management and the Ministry of Environmental Protection and Physical Planning is a positive first step in integrating environmental and agricultural policy-making.

The training of specialists, extension services and research have not been well developed, as Montenegro has drawn upon training and research in other parts of Yugoslavia. The development of a more market-oriented animal production, and increased trade in animal products may well constitute a danger for animal health. This is one reason why the first step in the development of an agricultural extension service has focused on veterinary services. A broader mandate for the extension services will be developed as from 2002. The Biotechnical Institute in Podgorica leads the extension service network and is also responsible for research in the agricultural sector. There is no higher education in agriculture in Montenegro.

Recently a new type of farmers' associations was developed within the framework of a project supported by the United States Department of Agriculture. A national association and more than 30 regional associations are operative, and government policy is to strengthen and develop this cooperative structure and to support agricultural production with input supplies and processing capacities. A few of the old *zadrugas* are still active, for example in the production of seed potatoes.

Future membership of the EU will require significant resources to build capacity and reform the institutions in the agricultural sector. Veterinary and phytosanitary services and food safety are only some of the different areas where demands for quantity as well as quality will grow substantially.

Environmental awareness of farmers and organic farming

Representatives of Montenegrin agriculture often point out that the food produced in their republic is "clean". However, activities aimed at raising the awareness of the farmers about environmental protection are limited. Environmental labelling of agricultural products is being discussed, but very little has been achieved so far.

12.5 Conclusions and recommendations

Recommendations to Serbia and to Montenegro

Certain aspects of the approximation to the EU agricultural policy will have a positive influence on the safety of agricultural production, animal and plant health, human health and the environment. This is in particular true for food, feed, animal and

crop control. It should also strengthen institutions and improve market access.

Recommendation 12.1:
***Serbia**'s Ministry of Agriculture and Water Management and **Montenegro**'s Ministry of Agriculture, Forestry and Water Management should transpose European Union regulations on phytosanitary, veterinary and food safety and genetically modified organisms and implement them as a priority. An important part of the implementation will be to organize the responsible institutions and make enough funding available to them. Serbia and Montenegro should work together to find efficient collaborative solutions.*

Recommendations to Serbia

Even if Serbia's agricultural production and products are to a considerable extent "environmentally friendly", this is not the result of directed policies. The use of inputs is likely to increase, and animal and crop production intensify. Economic growth, opening of markets for export and approximation to the EU will potentially have a negative effect on the environment. In this situation it is a challenge for Serbia to lay the foundation for an efficient and environmentally friendly agriculture. An essential first step is to ensure that agricultural and environmental policy-making are well integrated.

Good agricultural practices imply successful management of resources for agriculture to satisfy changing human needs while maintaining or improving the quality of the human environment and conserving natural resources. Good agricultural practices focus on issues such as reducing dependence on inputs based on fossil fuel, minimizing the risk of soil and environmental degradation, and increasing per capita productivity. They include various measures to improve management, improve efficiency in using production means and equipment, and improve farmers' living conditions.

The development of codes of good agricultural practice is an obligatory component in the implementation of the EC Nitrate Directive (91/676/EEC), and it could serve as a framework for ensuring the development of an environmental and efficient agriculture.

Recommendation 12.2:
(a) *The Ministry for Protection of Natural Resources and Environment and the Ministry of Agriculture and Water Management should establish an inter-ministerial working group, which should be a forum to discuss and make proposals on policy development in the agricultural sector.*

(b) *The inter-ministerial working group (if established), or the Ministry of Agriculture and Water Management, should manage the process of developing practical national codes of good agricultural practices and recommendations for their implementation. Measures should be taken to involve the other stakeholders, e.g. agricultural institutes, farmers associations, in this process.*

Extension services are a key instrument in the development of agricultural production. In Serbia, the extension services are well developed but will need to be reformed on the basis of new policy objectives for the agricultural sector.

Recommendation 12.3:
*The Ministry of Agriculture and Water Management, in further developing the extension services in **Serbia**, should support the implementation of "codes of good agricultural practices" once they have been established. In particular it should give the extension service a mandate and resources to actively promote the optimal and efficient use of agricultural inputs by helping farmers establish nitrogen management plans and apply integrated pest management where necessary.*

The level of agricultural sciences is high in Serbia even if the resources available for research are meagre at present. At the same time, there is a need to strengthen and broaden work on the environment in the activities of research, training and extension institutions. The integration of different research areas instead of compartmentalization and fragmentation is particularly important with regard to environmental issues. The interaction of relevant applied research with training and extension is essential in the development of an environmentally friendly agriculture.

Recommendation 12.4:
The Ministry for Protection of Natural Resources and Environment, the Ministry of Agriculture and Water Management and the Ministry of Health should initiate research programmes to improve the interdisciplinary understanding of the effects of agriculture on health and the environment. Improving the understanding of how to minimize

nutrient and pesticide run-off, and finding cost-effective and environmentally friendly solutions for the handling of manure are two examples. These research programmes should be linked to the development of codes for good agricultural practice, and the results used in training programmes for advisers from the extension services and in higher agricultural education.

The development of organic farming is important in a process towards sustainable agricultural production, although organic farming may not become a major source of agricultural products in Serbia in the immediate future. There is a federal law on organic agriculture, but there is no similar Serbian law.

Recommendation 12.5:
The Ministry of Agriculture and Water Management should promote the development of organic farming.

Recommendation 12.6:
The Ministry of Agriculture and Water Management and the Ministry for Protection of Natural Resources and Environment should promote ecological labelling of food products. Support should primarily be directed towards developing regulations, capacity building, providing information to the public and establishing and developing organizations for organic farming.

In the establishment of sectoral policies it will be important to look at opportunities for easing the pressure of agriculture on the environment with specific regulations. Several countries have practical experience of such regulations aiming, for example, to decrease nutrient run-off, erosion and contamination with pesticides. Such experience should be studied and its costs and implementation possibilities assessed.

Recommendation 12.7:
The Ministry of Agriculture and Water Management should include the following in an environment-related regulatory framework for agricultural production in a medium-term perspective and apply those considered feasible:

- *Application of the same permitting and inspection procedure for large animal production facilities as for any other industrial production facility;*
- *Restrictions on animal density per acreage of manure disposal;*
- *Instructions for manure storage facilities and spreading practices;*
- *Obligatory tests of pesticide sprayers and training of farmers using pesticides;*
- *Regulations on non-tilled protection zones along watercourses including drainage canals;*
- *Impact on biodiversity; and*
- *Restrictions on the use of genetically modified organisms.*

(see also recommendation 9.2.)

It is likely that the structure of Serbian agriculture will change drastically as a result of the planned reforms. For example, average farm size is likely to grow, production will intensify and the depopulation of the countryside might accelerate. Plans for irrigation and drainage are likely to be developed. These trends could lead to a loss of biodiversity, including animal and plant landraces, and of components of the traditional agricultural landscape.

Recommendation 12.8:
The Ministry of Agriculture and Water Management and the Ministry for Protection of Natural Resources and Environment, at the outset of the reforms that are planned, should define national priorities for the preservation of biotopes and the rural landscape, including wetlands. Priorities for the preservation of biotopes and landraces of crop plants and animals could be developed within the framework of a national biodiversity strategy. The priorities should be an important background for the development of agricultural policies.

Recommendations to Montenegro

The main direction of Montenegrin agriculture is extensive animal production based on the grazing of sheep and cattle in the interior highlands, and crop and orchard production in the coastal region and central plains. With few exceptions, agricultural production is in private hands and the farms are very small.

Agricultural policy aims to develop the dominating subsistence farming into a more market-oriented production. Subsidies are given to farmers for increasing their herds of cattle, sheep and goats. A major focus of agricultural policy is to create conditions for rural development and the preservation of the numerous villages in the countryside.

The Ministry of Agriculture, Forestry and Water Management is strongly committed to establishing an environmentally friendly agricultural policy. The inter-ministerial working group that has been established between the Ministry of Agriculture, Forestry and Water Management and the Ministry of Environmental Protection and Physical Planning may become an important tool for policy development.

Good agricultural practices implies successful management of resources for agriculture to satisfy changing human needs while maintaining or improving the quality of the human environment and conserving natural resources. The development of a code of good agricultural practice is an obligatory component in the implementation of the EC Nitrate Directive, and it should be developed as a framework for ensuring the development of an environmentally friendly and efficient agriculture.

Recommendation 12.9:
The inter-ministerial working group, established between the Ministry of Agriculture, Forestry and Water Management and the Ministry of Environmental Protection and Physical Planning, should:

(a) *Integrate environmental concerns in the development of agricultural policies. For example, any proposed input and price support policies should be carefully analysed from an environmental point of view; and*

(b) *Manage the development of practical codes of good agricultural practices and recommendations for implementation. Measures should be taken to involve important stakeholders in this process.*

The Montenegrin Government already intends to make use of the extensive, low-input agriculture in the marketing of its agricultural products. Healthy food should be offered to visiting tourists but possibly also for export. If such products could be sold at higher prices, this would raise the producers' awareness of the environment and support production methods with a low impact on the environment.

Recommendation 12.10:
The Ministry of Agriculture, Forestry and Water Management should promote the development of organic farming.

Recommendation 12.11:
The Ministry of Agriculture, Forestry and Water Management and the Ministry of Environmental Protection and Physical Planning should promote international labelling of food products by establishing regulations, supporting the establishments of organizations and capacity-building projects. The possible use of "Montenegrin food" as a trademark for "clean food" should be investigated.

The development of extension services for Montenegrin agriculture is under way. Extension is a key factor for the development of an efficient and sustainable agriculture, in particular when small-scale farming dominates.

Recommendation 12.12:
The Ministry of Agriculture, Forestry and Water Management, in developing the extension services, should include advice on how to achieve environmentally sound agricultural production. This should be reflected in the mandate and objectives of the extension services, and advisers should be given specific training on environmental problems caused by the agricultural sector as well as environmental labelling opportunities for agricultural production.

Chapter 13

TRANSPORT AND THE ENVIRONMENT

13.1 Introduction

The transport sector contributes to many environmental problems. It depends on non-renewable fossil fuels, particularly oil. It causes air, soil, water and noise pollution, biological and social impacts, and land use impacts that can affect environmental components locally (e.g. health impacts from smog), regionally (e.g. emissions causing acidification and eutrophication), and even globally (e.g. greenhouse gases and climate change).

Vehicle emissions comprise several hundred compounds. Significant pollutants include particulate matter (PM) (dust and soot −soot is a mixture of CO and HC), carbon monoxide (CO), carbon dioxide (CO_2), nitrogen oxides (NO_x), sulphur oxides (SO_x), and hydrocarbons (HC), collectively referred to as volatile organic compounds (VOCs). Vehicle emissions also include persistent compounds that can remain in the environment for many years (e.g. heavy metals such as lead (Pb) and cadmium (Cd), polyaromatic hydrocarbons (PAHs), and organochlorines). Some toxic pollutants (e.g., Pb) are largely related to fuel composition or additives. Some emissions (e.g. NO_x) are associated with the formation of secondary pollutants (e.g. ozone (O_3)).

Particulate matter, especially small diameter particles, is implicated in lung disease (diesel engines are the most important source). CO, produced during the incomplete combustion of fossil fuels, is poisonous in low concentrations. CO_2 is a greenhouse gas. NO_x, specifically NO_2, causes respiratory problems. NO_x contributes directly and indirectly to global warming. Sulphur and nitrogen compounds contribute to acid rain and eutrophication. VOCs are emitted as a result of incomplete combustion, spills, or as evaporative losses during fuel distribution and storage and vehicle use and refuelling. Some VOCs are mutagenic, carcinogenic, and neurotoxic (e.g. cancer morbidity and mortality is associated with exposure to benzene and PAHs). Note that the petrol engines of older vehicles emit a relatively high amount of benzene. Ground-level O_3 is formed when sunlight interacts with NO_x, VOCs and CO, forming smog. It causes eye irritation, respiratory problems and damage to plants. Ozone (O_3) is also a greenhouse gas and a phytochemical oxidant, helping to convert sulphur and nitrogen oxides into acids.

Land use is also a critical issue. Transport infrastructure removes land from other activities (e.g. agriculture), and it can fragment or destroy natural habitats. Urban sprawl generates the need for more transport infrastructure. Expanding the road network to alleviate congestion can be counterproductive, leading eventually to an increase in the volume of traffic.

The use and transport of hazardous materials pose the risk that toxic substances will be released into the environment (e.g. fuels, lubricants and cleaning fluids can be discharged during routine vehicle use, maintenance activities or at an accident). With river and ocean transport, there is always the risk of a significant oil spill and other issues associated with the management of shipping waste and port waste.

13.2 Yugoslavia

Federal institutions

Most transport functions have been transferred to the constituent republics. The main federal institution responsible for environmental protection is the Environment Department of the Federal Secretariat for Labour, Health and Social Care. In the transport sector, it is responsible for issuing permits for the transboundary movement of wastes and, should Yugoslavia accede to the Convention on Environmental Impact Assessment in a Transboundary Context, it will be responsible for exchanging transboundary EIA information.

The Federal Ministry of the Economy controls the use of international waters and monitors water-related transboundary impacts. Its Department for Water Resources issues permits for the construction of facilities that affect water resources of national

and international interest. The Federal Ministry of the Economy is also responsible for energy sources. The Federal Ministry of the Interior is responsible for the transport of dangerous goods, including hazardous substances. It is also generally responsible for road safety, especially through its traffic police. The Federal Hydrometeorological Institute is responsible for air pollution monitoring.

Federal environmental policies and legal framework

The overall federal environmental policy framework stems from the 1993 Resolution on Environmental Policy, the 1993 Resolution on Biodiversity Protection and the 1998 Law on the Basic Principles of Environmental Protection.

Two federal laws should be noted. The Law on the Water Regime regulates national and international watercourses. (The emission and water quality regulations have not been adopted, however.) The Law on the Transport of Hazardous Substances stipulates the conditions for the transport of hazardous substances (i.e. safety measures, permits for export, import and transit, and border inspections).

In general, Yugoslavia intends to upgrade transport capacities and equipment in conformity with EU standards. It has signed or ratified some 64 international agreements and conventions for the protection of the environment. Several focus on sea transport and the protection of the sea against pollution (e.g. the 1973 International Convention for the Prevention of Pollution from Ships). Also important for the transport sector are: the 1979 Convention on Long-range Transboundary Air Pollution, the 1989 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, the 1085 Vienna Convention on the Protection of the Ozone Layer, the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer, and the 1992 United Nations Framework Convention on Climate Change. Yugoslavia is preparing to ratify other relevant agreements, including the Convention on Environmental Impact Assessment in a Transboundary Context, the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, and the Convention on Cooperation for the Protection and Sustainable Use of the Danube River (see also chapter 4, on international cooperation and annex II.)

13.3 General Situation and Trends

Serbia's and Montenegro's transport sectors were significantly affected by the political changes of the 1990s, the 1992 sanctions and the 1999 war. Transport volumes for the sector as a whole today are about 23% of those of 1990. In the year 2000, passenger transport by road, rail and air was 48%, 30% and 13% of the 1990 figures. Urban passenger transport tends to recover the most quickly and, in 2002, it was at about 60% of the 1990 figure. Freight transport in 2000 compared to 1990 was as follows: road 9%, rail 25%, air 6%, sea 33% and inland waters 31%. The transport sector is overstaffed, suffers high costs, has insufficient, obsolete equipment that is difficult to repair and has a poor fare structure (about 30% cost recovery).

Table 13.1: Physical volume indices of transport services

Transport 1990 = 100

Year	Land					Water		Air
	Total	Railway	Road	Pipelines	Urban	Sea / coastal	Inland water	Air
1989	101	107	113	104	104	97	132	95
1990	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
1991	63	69	67	104	88	88	90	48
1992	39	58	59	129	77	52	79	15
1993	21	40	39	40	76	9	9	0
1994	18	31	27	35	94	0	8	0
1995	23	32	29	44	102	0	11	10
1996	29	31	34	69	103	27	46	13
1997	29	33	31	76	99	37	57	14
1998	29	35	31	92	96	45	50	13
1999	18	17	21	48	65	34	24	4
2000	23	27	25	54	58	32	31	13

Source: Based on the Statistical Yearbook of Yugoslavia, 2001.

Over the past 10–15 years, there has been little investment in network development and even less in the maintenance of the network (only about 30% of what was required). When the infrastructure is in poor condition, transport becomes more expensive, slow and unreliable, and social impacts (e.g. road accidents) and environmental impacts tend to increase (e.g. the lifespan of the transport asset is reduced, leading to the consumption of more resources to replace it). According to the World Bank, external financing requirements for 2002–2004 are as follows:

Table 13.2: External financing requirements for 2002 – 2004

	in million US$	% of total required
Road transport	340.0	77
River and maritime transport	16.5	4 *
Railways	60.5	14
Urban transport	8.0	2
Border infrastructure	15.0	3
Technical assistance	9.7	10

Source: World Bank, 2001.
Note: * excluding the port of Bar.

Funds for environmental protection may be secured from several sources, including 1–2% of the total investment capital of projects requiring EIAs in the transport sector, taxes on oil and oil derivatives, and on motor vehicles. These measures have not been introduced in Serbia; Montenegro is using some instruments to a limited extent. There are no noise taxes at airports. Energy taxes in general do not provide an incentive to use the least damaging energy source. There are no economic incentives to stimulate the import of new cars or cars with catalytic converters. Road tolls are used for infrastructure improvement, and not specifically for environmental improvements. In fact, some economic instruments compromise the environment. The sales tax on second-hand cars is based on the production year and the engine capacity. Older cars, which tend to pollute more, are taxed less – a system that increases the purchasing power of the less affluent.

With the disintegration of the Council for Mutual Economic Assistance, the number of domestically produced cars fell dramatically. The standard of living fell drastically, too. Car ownership, however, increased due in part to an increase in the number of imported second-hand vehicles.

Vehicles undergo yearly inspections. Although vehicle owners do get their vehicles tested, the vehicles are old (and perhaps do not stay in tune for very long), the standards are considered too low, and stricter testing may be required to meet even the current low standards. Most interviewees in Serbia and in Montenegro said that practically any vehicle could pass the test.

Also due to the sanctions, networks for smuggling low-quality fuels were developed. This smuggling persists, and an estimated 40% of oil products are still not registered. Domestically produced fuel is also of poor quality because the refineries that were bombed in 1999 were badly reconstructed. The use of diesel (a more polluting fuel, especially when vehicles are poorly maintained) is rising sharply, with diesel replacing petrol in some cases.

At the moment, the enforcement of technical and environmental standards is lax, resulting in poor air quality and dangerous conditions (e.g. technically unsound vehicles on the roads). For the time being, the governments have prioritized the affordability of transport, especially road transport, rather than the enforcement of standards.

Today, the capacity of Serbian and Montenegrin institutions to plan, manage and monitor transport activities (and associated environmental impacts) is less than it was in 1990. A World Bank review concluded that the road and rail administrations in particular had inadequate systems and procedures (e.g. databases) for monitoring road and rail conditions, and for planning and budgeting expenditures. It is also worth noting that there are no environmental engineers and no road safety engineers in Serbia and Montenegro at this time. Such experts are needed.

Overall, now is the right time to integrate environmental priorities into the capacity-building and rebuilding processes of both republics.

Table 13.3: Operations of transport, storage and communications enterprises

million km

	1990	1991	1996	1997	1998	1999*	2000*
Passenger - km	**26,642**	**18,862**	**14,983**	**14,515**	**14,132**	**9,151**	**10,300**
Land transport	19,531	15,412	14,915	13,469	13,228	8,819	9,374
By rail	4,794	2,935	1,839	1,744	1,622	860	1,436
By road	6,733	5,363	3,913	3,764	3,919	2,765	3,244
Urban transport	8,004	7,114	8,272	7,961	7,678	5,194	4,694
Water transport	9.1	6.6	5.3	..	..	..	0.2
Sea transport	9.1	6.6	5.3	..	..	..	0.2
Inland waterway transport	..	..	..	..	..	..	..
Air transport	7,102	3,443	963	1,046	904	332	926
Ton- km	**106,778**	**90,580**	**28,957**	**38,164**	**45,601**	**32,978**	**32,863**
Land transport	15,378	10,640	3,898	4,145	4,522	2,307	3,077
By rail	7,744	5,760	2,062	2,432	2,793	1,267	1,969
By road	6,779	3,985	1,243	1,063	945	630	647
Via pipelines (total of ton-km of oil and gas pipelines)	855	895	593	650	784	410	461
Water transport	91,265	79,878	25,054	34,013	41,073	16,918	29,779
Sea transport	88,033	76,962	23,732	32,188	29,479	29,892	28,799
Inland waterway transport	3,232	2,916	1,322	1,825	1,594	778	980
Air transport	135.0	62.0	4.9	5.8	6.0	1.6	7.4

Source: Federal Statistical Office. Statistical Yearbook of Yugoslavia, 2001.
Note: * Data for 1999 and 2000 do not include Kosovo.

Table 13.4: Energy consumption

thousand tons

	1975	1985	1990	1993	1994	1995	1996	1997
Petrol, crude	447	1,291	1,335	164	147	142	405	813
Other petrols	354	406	768	110	76	33	78	246
Lamp oil	74	227	116	27	18	25	31	39
Diesel fuel	495	1,053	985	236	298	338	390	784
Fuel oil	1,371	1,569	1,804	465	347	365	563	959
Lubricating oil	23	306	465	181	180	225	237	166
Bitumen		229	218	32	34	37	69	93
Liquid gas	36	67	121	10	12	13	27	67

Source: Federal Statistical Office. Statistical Ecobulletin 1998.

13.4 Serbia

Current situation and trends

Geographically, Serbia occupies a strategic transit position in South-Eastern Europe. It is crossed by trans-European Corridor X (Salzburg–Villach–Ljubljana–Zagreb–Belgrade–Nis–Skopje–Thessaloniki) and also contributes to two Corridor X branches: Branch B (Belgrade–Novi Sad–Budapest) and Branch C (Nis–Sofia–Corridor IV).

Road transport

Serbia has about 14,500 km of main and regional roads and about 22,000 km of local roads (excluding Kosovo). Serbia could eventually serve a significant amount of international road transit traffic on Corridor X.

The road network needs intensive maintenance and immediate attention to road safety (especially to repairing road surfaces and signs). According to the Ministry of Transport and Telecommunications, about 90% of the highways and 70% of the arterial roads need some degree of rehabilitation. Also, some new road links are needed and the war-damaged infrastructure needs to be reconstructed.

Accurate, comprehensive, disaggregated vehicle statistics for Serbia were not available at the time of this assessment, but in the 1985–1990 period, car ownership in general was increasing quickly, at about 5% per year (from 1,080,067 to 1,405,455,

about 5% of which may be vehicles in Montenegro). A 1999 study by the Institute for Traffic showed that the density of traffic in Belgrade had increased 44% since 1991. In 1999, Serbia had 2,260,453 registered road vehicles, indicating about a 7% increase per year in the vehicle stock for the 1990–1999 period. During the 1990s, many second-hand cars were imported, so the average age of vehicles is probably quite high. A new law now restricts the import of vehicles over six years old.

Rail transport

Serbia has 3,809 km of railway lines, of which 874 km contribute to trans-European Corridor X. The railway system is indebted and overstaffed, and has high operating costs and low revenues (domestic rail passengers pay extremely low fares; domestic freight traffic is also too cheap). The national railway company, ZTP Beograd, depends on subsidies. The rail system is in a poor condition after more than a decade of inadequate maintenance and little renewal of assets. There are speed restrictions on about 70% of the network. Derailments are frequent. The service is considered unreliable, and the maximum axle load is about 20 tons (the standard is 22.5 tons). Most freight wagons and passenger coaches are over 20 years old, and less than half are in service at any given time.

International traffic is important, constituting about 60% of the freight traffic for import/export or for transit transport. There is potentially a high demand for a fast, reliable rail system. Serious investments in maintenance/rehabilitation are needed, however. ZTP signed a loan agreement with the European Bank for Reconstruction and Development (EBRD) to finance the ZTP Belgrade Reconstruction Project. Project components (which focus on Corridor X) include the implementation of a labour restructuring plan, the purchase of track maintenance equipment and spare parts, the refurbishment of electric locomotives, and consulting services.

The rail system needs to become self-financing. Without the active promotion of the railways, low volume rail stations and passenger services may be eliminated.

Air transport

Air transport in Serbia has an excellent safety record, but the Belgrade airport runway needs precision instruments for landing in conditions of limited visibility and to be upgraded from SAT II to SAT III-b. The Belgrade terminal building has a 6-million-passengers/year capacity. Over the past few years, traffic has dropped from 4 million to about 1 million passengers/year. The Ministry of Transport and Telecommunications has signed a memorandum of understanding with a foreign company to rehabilitate and reconstruct some buildings and equipment at Belgrade airport.

Belgrade airport has potential as a regional hub for aircraft flying from the Far East and Western Asia to Western Europe and for freight destined for Eastern Europe or North Africa. The development plan for Belgrade airport includes an additional runway to increase capacity.

River transport

River transport is highly competitive (and generally environmentally desirable), especially for bulk cargo (e.g. cereals, construction material and oil products). After the Volga, the Danube (2,857 km) is the second longest international river in Europe, and it previously carried the second largest amount of river cargo, after the Rhine. Twenty-three per cent or 588 km of the Danube flows through Serbia. Until recently, the Danube was a major transit corridor connecting the Black Sea to the North Sea. The Danube and its two main tributaries, the Tisza flowing from Hungary and the Sava from Slovenia, are part of Corridor VII of the trans-European network. Within Serbia, the Danube navigation system extends over 1,599 km, with rivers accounting for 1,000 km and the Danube–Tisza–Danube canal system accounting for 599 km. Before the 1999 conflict, the Sava-to-Danube river route provided cost-efficient and environmentally friendly transport to important domestic industrial centres.

There has been little maintenance of the riverbeds for more than 10 years. There is currently little river traffic on the Danube and Sava because of war damage. Reopening the rivers is an international priority, but this will require the upgrading of navigability and signalling and the clearing of war debris from both the riverbed and the riverbanks. The Danube Commission recommends increasing the river depth to 2.8 metres. New bridges are needed at Novi Sad (Sloboda and Zezelj bridges) and on the Sava River (Ostruznica bridge). Subsequent to the clean-up and upgrading, river operators expect traffic to resume quickly.

The river fleet includes more than 900 (many >40 years old) vessels, of which 240 are ships and 535 barges. Only 30% of river transport capacity and only 24% of port capacity are currently used. The old river port equipment prevents the rapid unloading of vessels, and may become a bottleneck as traffic picks up. The Danube Project Centre intends to cooperate with a German association to establish a transport link from the Atlantic Ocean to the Black Sea. This is expected to include investment projects for the Belgrade and Pancevo ports, the development of roll-on-roll-off container transport, the reconstruction of two Serbian shipyards and the daily opening of the pontoon bridge in Novi Sad.

As an implementing partner of the Federal Government, Serbia participates in several initiatives: the Danube Cooperation process (Austria and Romania); the International Commission of the Sava River Basin (Stability Pact for South Eastern Europe); and the Danube Commission.

Public transport in Belgrade

Public transport in the city of Belgrade is well used, but there are no accurate statistics on the number of passengers. Public transport is subsidized and, even with fare increases, a 50% cost recovery is thought to be ambitious. Buses are the prevalent public transport method, but there are also trams and trolleybuses in the city centre. The public transport fleet is rather old, with many vehicles (especially some of the privately owned buses) more than 20 years old. There are 650 public transport vehicles and 250 that are privately owned. Estimated current needs are for 1,400 public transport vehicles. Some 120 buses will be purchased through EBRD and 93 through bilateral funds. There are also plans to purchase some 20 new trolleybuses and to reconstruct 3 tramcars.

Table 13.5: Registered road vehicles and trailers, end of 1999

	Yugoslavia	Montenegro	Serbia			
			All	Central Serbia	Vojvodina	% Serbian total
Motorcycles	**35,717**	**170**	**35,547**	**27,711**	**7,836**	**100**
Legal entities	783	1	782	628	154	
Physical persons	34,934	169	34,765	27,083	7,682	
Passenger cars	**1,667,930**	**95,329**	**1,572,601**	**1,212,656**	**359,945**	**94**
Legal entities	74,849	3,484	71,365	55,376	15,989	
Physical persons	1,593,081	91,845	1,501,236	1,157,280	343,956	
Special passenger cars	**21,255**	**673**	**20,582**	**20,508**	**74**	**97**
Legal entities	4,451	116	4,335	4,268	67	
Physical persons	16,804	557	16,247	16,240	7	
Buses	**11,756**	**575**	**11,181**	**8,907**	**2,274**	**95**
Legal entities	10,888	523	10,365	8,278	2,087	
Physical persons	868	52	816	629	187	
Lorries (trucks)	**114,245**	**8,072**	**106,173**	**76,027**	**30,146**	**93**
Legal entities	45,840	3,169	42,671	30,419	12,252	
Physical persons	68,405	4,903	63,502	45,608	17,894	
Special trucks and lorries	**24,510**	**657**	**23,853**	**21,003**	**2,850**	**97**
Legal entities	14,788	480	14,308	12,240	2,068	
Physical persons	9,722	177	9,545	8,763	782	
Motor vehicles with special purpose machinery	**2,430**	**0**	**2,430**	**2,164**	**266**	**100**
Legal entities	1,897	0	1,897	1,661	236	
Physical persons	533	0	533	503	30	
Tractors	**326,003**	**494**	**325,509**	**216,141**	**109,368**	**100**
Legal entities	23,235	366	22,869	10,894	11,975	
Physical persons	302,768	128	302,640	205,247	97,393	
Trailers and semi-trailers	**163,671**	**1,094**	**162,577**	**84,280**	**78,297**	**99**
Legal entities	31,770	787	30,983	14,997	15,986	
Physical persons	131,901	307	131,594	69,283	62,311	
Total	**2,367,517**	**107,064**	**2,260,453**	**1,669,397**	**591,056**	
Per cent of Yugoslavia		**5**	**95**	**74**	**35**	

Source: Federal Statistical Office. Statistical Yearbook of Yugoslavia, 2001.

Environmental impacts of the transport sector

Emissions

Road transport in Serbia accounts for 80 dB(A) noise levels, 90% of CO, 80% of benzene, 50% of NO_x, 50% of Pb, 10% of NO_2, 40% of HC and 15% of CO_2. Air pollution is monitored in Serbia's larger cities (e.g. Nis, Belgrade), albeit at a reduced level since the early 1990s. Traffic is compromising air quality in certain downtown locations. For example, the levels of oxides of nitrogen, soot and carbon monoxide regularly exceed the permissible levels at one monitoring site in Belgrade (soot levels exceeded maximum allowable concentrations on 141 days in 2000).

In 2000, daytime and night-time noise levels along busy traffic arteries in Belgrade regularly exceeded allowable noise levels by about 1–20 dB(A). (Noise levels are measured in other Serbian cities, but data were not available.) JAT airline has 8 (of 22) planes that fly to Eastern Europe and Africa that do not meet European regulations for noise. Currently, there are no plans to replace them.

At the time of this assessment, no information was provided on the management of waste associated with the river clean-up and upgrading programme. There is likely to be a large volume of debris (e.g. unexploded ammunition, sunken ships) and dredged river sediments. Some of this material may be toxic.

Road safety

Ministry of Internal Affairs statistics for 2000–2001 show that most road accidents (94%) and road-accident deaths (78%) occur in populated areas. Serbia has road safety objectives, having adopted Sweden's "zero tolerance" policy to road accidents. Serbia's traffic-police model has been reviewed and approved by the EU. The traffic police impose fines that are six to seven times higher than in previous years and the accident rate has decreased by 45% since 2001.

Accident black spots (and the road maintenance and remediation programme) are identified using a highway development management system (HDM4) (this being a relatively new requirement for international financing), and each black spot is analysed. The College of Traffic assists with this task. It was not possible at the time of this mission to assess the black spot analysis procedure or to determine how or whether its results are integrated into the design of road maintenance and rehabilitation programmes. There are currently no road safety engineers in Serbia, although some engineers have received some road safety training abroad.

Policy objectives and environmental management

The policy framework

The main transport priority is rehabilitating current assets and reforming the sector. The Ministry of Transport and Telecommunications intends to introduce modern management practices, pricing reforms to increase transport revenues and reduce the need for State subsidies, and structural reforms.

There is no formal environmental transport policy, but several initiatives are noteworthy:

- There is a 1998 draft transport policy which integrated the transport modes; it was shelved with the change in government;
- The River Traffic Directorate collaborated with the Ministry for Protection of Natural Resources and Environment to estimate the environmental effect of replacing road cargo with rail and water transport. This exercise also addressed intermodal issues and identified suitable locations for these; and
- A "Basic Concept of Preliminary Activities for the Introduction of an Environmental Management System (ISO 14000)" was developed for the rail sector, and this was integrated into the new business plan.

The Central European Initiative (CEI), founded in 1998, has a new Subgroup on Environment and Transport involved in various sustainable transport projects, including the preparation of a "Declaration Towards Sustainable Transport in the CEI Countries". Yugoslavia acceded to CEI in 2000, but Serbia has not yet participated in this Subgroup.

Table 13.6: Basic indicators of road traffic security

Year	Total number of accidents	Total number of accidents with casualties	Killed	Injured
1990	..	18,667	..	..
1991	..	17,754	..	..
1992	27,286	12,628	1,584	16,857
1993	17,257	8,956	1,058	11,790
1994	17,755	9,985	1,097	12,843
1995	18,827	10,528	999	13,938
1996	61,465	13,627	1,124	16,881
1997	67,994	15,476	1,327	20,296
1998	62,224	14,491	1,331	18,856
1999	45,339	11,860	1,100	15,079
2000	48,830	12,750	1,048	16,620
2001	61,441	15,069	1,273	19,862

Source: Ministry of Internal Affairs, Serbia, 2002.

Urban and regional transport planning

The transport corridors are coordinated with the European network through the Spatial Plan. The road sub-sector has special plans for high-priority highways linking Serbia to Croatia, Romania, Hungary, the former Yugoslav Republic of Macedonia, Bulgaria, and Montenegro. Environmental experts provided input to these special plans (e.g. animal underpasses near parks, channels to collect run-off). The existing and planned rail corridors are defined as double-track, electrified lines connecting Serbia to its neighbours. To integrate with the European waterway network, harbours and quays will be developed on the Danube in Novi Sad, Belgrade, Pancevo and Prahovo. For the air traffic sector, the Spatial Plan states that Belgrade, Nis and Pristina airports will be expanded and modernized.

The Spatial Plan identifies transport and distribution centres and terminals that complement the planned container terminals on the rail, port and road network. Eleven sites were selected for phase 1 (mainly located on Corridor X); and 19 were selected for phase 2 (mainly serving the hinterland).

At the local level, the Spatial Plan for Belgrade establishes a ring road to segregate transit from local traffic. The ring road is serviced with a big parking zone linked to public transport. The Plan also limits traffic in the city centre. More public transport (trams and trolleybuses) is planned, and the long-term vision includes a metro. Based on the above, land-use planning is being used to some extent to integrate environmental policy into the transport sector. However, more could be done, for instance, to plan and develop infrastructure for non-motorized transport (e.g. cyclists).

Economic instruments

There are several economic instruments in Serbia's transport sector, but none of these is specific to environmental protection. In fact, the structure of vehicle registration taxes does not penalize the owners of heavily polluting cars (old cars are generally taxed less). Current economic instruments are grossly insufficient to encourage sustainable transport.

The legal framework

Some transport laws are being harmonized with EU legislation (e.g. the rail law and the law on road traffic). However, these do not deal specifically with the environment. There are three important environmental instruments in Serbia: the 1991 Law on Environmental Protection and the new draft law on the environmental protection system and the 1992 Regulations on Environmental Impact Assessment (EIA) of Facilities and Works (see also chapter 1, on the decision-making framework for environmental protection).

According to the Regulations on EIA of Facilities and Works, large road and rail projects must complete an EIA. To date, at least 7 road projects (400 km) and some 22 rail-sector projects have completed EIAs. To a large extent, consultants used World Bank EIA guidelines, as there are no formal Serbian guidelines and the World Bank guidelines respect international standards. The EIA results were (apparently) integrated into the designs.

Environmental mitigation measures included noise barriers, replanting, ventilation, erosion-control measures and water-pollution control measures.

A road-sector EIA was reviewed as part of this assessment exercise. Although it is of fair quality, it is project-specific and does not address any strategic questions. Strategic assessments are becoming the international norm, and allow bigger questions to be answered, such as, what would be the impact of a large increase in international traffic (e.g. Belgrade airport becoming an international hub; the upgrading of trans-European Corridor X in the rail and road sector, and the reopening of the Danube, an international waterway) and what would be the impact of switching the traffic to another transport mode.

Another problem is the absence of any environmental auditing procedures for existing operations (e.g. ports and airports). Regular audits (e.g. yearly), whether certified (ISO, EMAS) or non-certified (internal audits) can evaluate the environmental performance of an installation against set criteria, usually environmental quality norms. Various environmental improvements can be identified on the basis of the assessment. Such a procedure in the case of Belgrade airport could alert the relevant authorities to the need to prevent illegal encroachment near the runway and it could make recommendations on how to improve the airport's waste management system.

Also of interest, a new draft law on planning and construction is being prepared. It will require each sector to draw up a spatial plan within one year of the date the legislation is promulgated. The document will be binding on the lower levels of government.

The institutional framework

The Ministry of Transport and Telecommunications and its directorates, supporting technical institutes (e.g. the Institute of Transport, the Faculty of Civil Engineering of the University of Belgrade), and public companies and contractors (e.g. ZTP rail company, JAT airline, 15 road maintenance enterprises) plan, design, construct, supervise, monitor, operate and maintain transport-sector projects. As such, the Ministry is largely responsible for its own environmental management.

The directorates (road, rail, air, water traffic) are charged with the monitoring, supervision and financial management of relevant projects. At this time, neither the Ministry nor its directorates have environmental units or environmental officers. The following provides some justification for more in-house environmental management expertise at the Ministry and within its directorates:

- There is currently no sustainable transport strategy or transport policy that incorporates environmental considerations;
- None of the directorates has sub-sector specific technical guidelines for environmental management;
- There are no environmental engineers (the Faculty of Civil Engineering does offer a road-and-environment course);
- Given the increasing environmental management requirements, all transport planners, engineers, contractors and maintenance crews would benefit from some environmental management training;
- The Road Directorate indicated that it needed environmental information (e.g. information on how to deal with air pollutants, old tires and used oil);
- The Air Traffic Directorate has no technical capacity to measure noise levels; and
- People are encroaching on the flight path of the runway, building illegal settlements on one side. (This should be discouraged immediately to avoid bigger problems in the future.)

It should be noted that when the new rail law is approved, the Rail Company will establish a "research and development, quality and environmental unit" in its Development Section. This unit will initially focus on the environmental education of staff and the management of waste water and oily water from the cleaning and maintenance stations. Currently, however, financial resources are insufficient for the task.

Other institutions with specialist roles are involved in the environmental management of the transport sector. The new Ministry for Protection of Natural Resources and Environment is responsible for the protection of air, for identifying environmental protection requirements in the building of any facilities, for protection against noise and vibrations and for protection against non-ionizing radiation, chemicals, waste and hazardous matter in, inter alia, transport. The Ministry is also responsible for emission and activity inspections.

For activities that may change the water regime (e.g. bridge construction), the Ministry of

Agriculture and Water Management sets the water resources conditions. The Ministry of Construction and Urban Planning grants urban planning permits for each "change in the use of space". The Ministry of Energy and Mining sets energy policy, but major energy policy decisions are made by the Cabinet (e.g. oil and gas prices).

The Ministry of Internal Affairs is responsible for vehicle registration and the police department, including the traffic police. The Institute for Public Health, the Republic Hydrometeorological Institute, and the local institutes for public health share environmental monitoring duties (e.g. air, noise). There are about 500 vehicle-testing stations.

The local secretariats for environmental protection are responsible for environmental management (e.g. air protection, noise monitoring), although they have little capacity for doing so.

Standards

Vehicle testing

Some 500 stations test vehicles, but the police may at times intensify vehicle testing through the use of mobile teams. Of the 1.6 million vehicles tested in 2001, about 51,000 initially failed the exhaust emissions test; in general, these vehicles required retuning. New standards for CO and for opacity are being developed.

Fuel standards

There are no plans to improve fuel quality or to phase out the use of leaded petrol.

13.5 Montenegro

Current situation and trends

Montenegro is not currently integrated into the European transport network. It may want to apply to include Bar–Belgrade in trans-European Corridors V or X, to ensure its integration into the European transport networks.

Road transport

Montenegro has about 850 km of main roads, 950 km of regional roads and 5,300 km of local roads. Because of its geography, Montenegrin roads are costly, generally requiring numerous bridges, tunnels and slope protection works. There are frequent rockfalls and landslides, some causing accidents. Maintenance costs are also unusually high due to the topography (estimated at 2–3% of GNP, instead of the usual 1%). There is no accurate road condition database, but road maintenance has been neglected over the past decade, with only about 25–30% of the maintenance work being budgeted.

There is some variation in the statistics on the vehicle fleet, depending on the data source. The Ministry of Maritime Trade and Transport's data show significant swings in the total number of vehicles registered from 1997 to 2000, with 1998 having the highest number (184,447 against 131,024 vehicles listed for 2000). Cars destined for Serbia were imported through Montenegro, hence the "bloated" numbers. (There are now stricter controls on car imports.)

The Statistical Yearbook (2001) of Yugoslavia indicates that Montenegro had 107,064 vehicles in 1999. Regardless of which data are most accurate, the vehicle stock is increasing rapidly, and traffic congestion in Podgorica is now a daily occurrence. Because of the large number of second-hand cars imported, the vehicle age is probably quite high. A decree (No. 15/2002) to restrict the import of used vehicles, engines and machines for building and mining has now been adopted.

Rail transport

There are about 250 km of railway lines in Montenegro. The north–south line links the port of Bar to Serbia; the east–west line linking Podgorica to Niksic is very old and deteriorated. There is also a short section from Skadarsko Jezero to the Albanian border. Only the Podgorica–Niksic section (56 km) is not electrified. The railway system is hampered by Montenegro's topography, making it costly to operate and maintain. It was built in the 1960s and 1970s, and investments and repairs have been limited since then. The rail company has a large foreign debt, is highly subsidized, has high operating costs and is overstaffed. Passenger fares are very low, but freight tariffs are almost at cost-recovery level.

The two main railway clients are the bauxite mine in Niksic and the aluminium complex in Podgorica. The future of the railways in Montenegro depends on the political relationship with Serbia, the performance of the Serbian railways and the development of the port of Bar (e.g. type, quantity and final destination of cargo shipped through the port).

Table 13.7: Number of registered passenger cars, buses and freight vehicles

Year	1997	1998	1999	2000	2001 (to 04.12)
Buses	382	802	1,139	811	561
Passenger cars	101,685	170,801	118,095	118,865	82,544
Freight vehicles	6,157	12,844	11,076	11,348	7,093
Total	108,224	184,447	130,310	131,024	90,198

Source: Ministry of Transport, 2002.

Necessary investments include the maintenance and rehabilitation of the track, tunnels and bridges, the locomotives and rolling stock, the signalling system, and the purchase of track repair equipment.

Maritime transport

Montenegro has 295 km of coastline with four ports, of which the port of Bar handles 95% of maritime traffic. Eighty-two per cent of this traffic are imports and 78% of these are for the Montenegrin market.

The political and economic situation had a negative overall effect on business in the port area and the marked decrease in imports and exports has reduced traffic and the port's revenues. This situation was not helped by the railways (Belgrade – Bar line). However, despite the above and other problems, the port of Bar has managed to expand its international market and is on the way to becoming the regional centre for container shipping on the Adriatic.

The port of Bar is a joint-stock company owned 81.87% by Montenegro, 17.31% by the port's employees, 0.13% by the zone's founders and 0.69% by the Bar municipality.

The port of Bar is well equipped and maintained, and enjoys good facilities for market operations. It has an international certificate of quality, ISO 9001 – SGS 1 CS-Switzerland for its port traffic services, so becoming the first enterprise in Montenegro to gain an international certificate and one of the first certified ports in the Mediterranean. The port has an environmental protection project "Protection of the sea and coast in the Montenegrin coastal area and the port of Bar basin." The project aims to ensure that the port respects the International Convention for the Prevention of Pollution from Ships (MARPOL Convention) and Montenegro's environmental protection laws. To this end it has prepared a "Plan for urgent action/Plan for environmental management" to deal with any oil spills. At present there are no facilities for the storage of waste in the port of Bar and ships using the port have to find solutions for the disposal of waste in other ports.

Montenegro has two shipping companies, which owned 42 ships before the sanctions, but had to sell 36 of them. However, the Government and the companies themselves are taking steps to revitalize their businesses.

Air transport

Montenegro has two international airports (Tivat and Podgorica) and some minor airports. Podgorica airport mainly serves air traffic to Belgrade; Tivat (on the coast) mainly serves charter flights for tourists. The two airports meet basic aviation requirements and have reserve runway and landing-strip capacity. They need basic modernization and extension to cope with future demand. Montenegro hopes to take over from Serbia the management of both airports in June 2002. (Serbian-owned JAT currently manages Tivat airport; the army currently manages the runway in Podgorica.)

Public transport in Podgorica

There are about 280 (mainly diesel) buses in Podgorica. There are no accurate statistics available on the number of passengers using them. The public transport system was recently reorganized into groups, each group consisting of one urban line and three suburban lines. Transporters (private and public) can bid for the various groups. There are ongoing attempts to improve the line service (e.g. by increasing the number of buses per line and by decreasing journey time). To put the public transport system on a safer footing, the municipality of Podgorica is undertaking client surveys. These will likely demand an increase in the frequency of buses on the lines. The municipality also intends to analyse why passengers are choosing "illegal" transporters (i.e. private car owners and off-duty taxi drivers) and

then to identify measures that will attract public transport users back to the official system.

Environmental impacts

Emissions

Air pollution from motor vehicles is monitored at 19 major traffic arteries in 17 urban areas. Concentrations of NO_2, SO_2, HC, PM_{10}, and Pb are generally below regulated limits, with a few exceptions. For instance, at one city-centre location in Podgorica, the HC concentration was 12 times higher than the Montenegrin standard, CO was twice the EU standard and NO_2 was twice the Montenegrin standard. A study by the University Centre for Engines and Vehicles in 2000 showed that motor vehicle emissions contributed about 80% to total air pollution in downtown Podgorica (see also chapter 6, on air management).

Montenegro has a great tourism potential, and it must protect its coast from maritime transport pollution. Some local contamination with hydrocarbons was observed at the port of Bar at one point, but no such contamination was noted when the port was visited at the time of this assessment (see also chapter 14, on tourism and environment).

Car wrecks and old abandoned cars are a common sight along the Montenegrin roads and constitute a special waste management problem. Furthermore, about 150 buses (15–20 years old) were imported from Italy last year. Most of these have become a waste management problem and are now taking up parking space, as there are no funds to repair them.

There are too many birds near Tivat airport because of nearby waste management practices. The birds increase the risk of accidents.

Road safety

Road accident statistics for 1997 to 2001 showed a general decrease in the number of accident fatalities, the number of persons injured and the number of accidents with material damage. It is unclear whether the statistics denote improvements in road safety or simply reflect reduced traffic. Further analysis and monitoring are required.

Policy objectives and environmental management

The policy framework

The 1991 "Declaration on the Ecological State of Montenegro", which is reaffirmed in the 1994 Constitution, provides the general framework for environmental policy in Montenegro. Montenegro has a sustainable development strategy, but no sustainable transport strategy, as yet.

There are other (separate) initiatives that are noteworthy. Together, these provide a sound basis for the development of a comprehensive sustainable transport strategy:

- Montenegro's Government intends to prepare a national environmental protection programme (NPZZS) and a national environmental action plan (NEAP). The NEAP will address the transport sector;
- The Government intends to adopt EU standards;
- The Ministry of Maritime Trade and Transport can get advice from the University Centre for Engines and Vehicles of Montenegro; and
- Representatives from the Ministry of Environmental Protection and Physical Planning and the Ministry of Maritime Trade and Transport are participating in the CEI working group on transport. This forum triggered the development of a project proposal titled "Development of the Strategic Evaluation of the Environmental Impacts (SEA) of Transport and Transport Infrastructure in the Republic of Montenegro." The study will identify impacts for each transport mode and evaluate the effect of various modal shifts.

Table 13.8: Number of traffic accidents

Year	1997	1998	1999	2000	2001 (to 04.12)
Accidents with deaths	128	133	99	57	55
Accidents with persons injured	1,378	1,401	1,349	1,085	951
Accidents with material damage	4,636	5,126	4,835	3,979	3,163

Source: Ministry of Transport, 2002.

Urban and regional transport planning

There are two new rail projects, still unfunded, from Niksic to Sarajevo and a new line from Bijelo Polje to Kosovo. In the road sub-sector, the Government is advocating at least three very expensive road construction projects: the Sozina tunnel on the Podgorica–Bar Road funded by the Government of Montenegro on which work has already started, the Podgorica by-pass, and the Kotor Bay bridge. Because of the expense, and the need to prioritize maintenance rather than new development, the last two projects are unlikely to obtain funding in the near future. Note that the Podgorica–Bar project would provide another crossing over Skadarsko Jezero. This lake is an ecological treasure, shared with Albania, and hence is transboundary, bringing it under the purview of the Federal Government as well.

Laws and regulations

There are several legislative instruments relevant to the transport sector in Montenegro: the Law on the Environment (1996), the Law on Air Protection and the Regulations on Admissible Concentrations of Harmful Substances in the Air, the Law on Waters, and the Regulations on Environmental Impact Assessment (1997).

Most relevant to the transport sector, the Regulations on Environmental Impact Assessment (1997) require that large road and rail projects complete an environmental impact assessment (EIA). To date, no rail projects have gone through such an assessment. One road tunnel and three bridges have gone through the EIA process. The Ministry of Environmental Protection and Physical Planning considered the EIAs satisfactory, but not very quantitative. There are no EIA evaluation criteria and no EIA commission to evaluate the EIAs.

Responsible institutions

The Ministry of Maritime Trade and Transport and its directorates, supporting institutes, and public companies plan, design, execute, supervise and monitor transport sector projects, and as such they are responsible for environmental management.

The Road Administration manages its network, contracting out most of the work to a State-owned enterprise. The Rail Administration supervises the rail network and the rail services are operated by a public enterprise. Only one enterprise can undertake track maintenance. Neither the Road Administration nor the Rail Administration has an environmental unit or environmental officers.

Montenegro now has only one airline, Montenegro Airline Ltd. It has two good-quality aeroplanes, purchased in 1997.

Other institutions with specialist roles are involved in the environmental management of the transport sector. The Ministry of Environmental Protection and Spatial Planning is responsible for the implementation of the Law on the Environment and subsequent regulations. The Ministry of Industry, Energy and Mining sets energy policy. The Ministry of Urban Planning regulates physical planning. The Ministry of Health has some responsibility for protecting the public against environmental impacts. The Ministry of Internal Affairs registers vehicles and provides traffic police. Vehicles are tested at the time of registration by Services that are certified to do so. The Republic Hydrometeorological Institute, the Centre for Ecotoxicological Research and the Institute for Public Health carry out some air pollution monitoring (see also chapter 3, on information, public participation and awareness–raising and chapter 6, on air management)

There are local secretariats and inspectorates for environmental protection. Furthermore, the municipality of Podgorica develops and implements regulations on public transport and assesses transport lines.

Standards

Vehicle testing

Most interviewees indicated that the vehicle test was superficial, the standards too lax, and that any car could pass the test. As is the case in Serbia, there are currently too many vehicle-testing stations, some not up to par.

Fuel standards

Montenegro imports all of its petrol. According to one source in the Ministry of Industry, about 70,000 tons of diesel is imported per year. The same amount of petrol is imported, of which 50,000 tons is MB98 (motor petrol super), and 20,000 tons is BMB95 (unleaded petrol premium). The amount of unleaded petrol imported each year is increasing, as more West European vehicles requiring this grade are imported.

Poor-quality fuel and lubricants are in use. There are currently no initiatives to improve fuel quality standards, nor any discussion on phasing out the use of leaded fuel.

Economic instruments

Currently, there is an ecological tax on fossil fuels, as follows:

- MB98: € 0.002/l;
- BMB95: € 0.002/l; and
- Diesel: € 0.003/l.

Since January 1998, there has been a 10% vehicle-related tax for environmental purposes. Hence, Montenegro is beginning to use economic instruments to control the environmental impacts of transport.

13.6 Conclusions and Recommendations

Recommendations to the Federal Government, Serbia and Montenegro

The current transport budget for 2002–2004 allocates 77% to road transport, 4% to water transport (excluding the port of Bar), 14% to rail transport and 2% to urban transport. Thousands of kilometres of road need to be maintained and rehabilitated, but for transport to be sustainable more resources need to be allocated to modes of transport that have a less negative impact on the environment.

Recommendation 13.1:
*The responsible authorities of the **Federal Government**, **Serbia** and **Montenegro** should allocate a greater percentage of funding for rail, water and urban public transport based on sustainable transport policies. Consideration should also be given to services for non-motorized transport.*

New vehicles generally consume less fuel and pollute less. They are also most likely to run on unleaded petrol only. However, at the moment, older cars are taxed less. In addition, due to the sanctions, networks smuggling low-quality fuels developed and are still active. Domestically produced fuel is of low quality. Diesel engines are the most significant source of particulate matter, which is implicated in lung disease. Diesel use is rising sharply, however, with diesel substituting for petrol in some cases.

Recommendation 13.2:
*The responsible authorities of the **Federal Government** and **Serbia** and **Montenegro** should develop a strategy to phase out highly polluting cars and to introduce high-quality fuels, taking into account environmental elements. This could be achieved through fiscal measures, such as eco-taxes and car registration taxes, or other measures.*

Recommendations to Serbia and to Montenegro

Neither the Ministry of Transport and Telecommunications in Serbia nor the Ministry of Maritime Trade and Transport in Montenegro has an environmental or sustainable transport policy. In Serbia, the 1998 transport policy and the rail sector's environmental management system could provide input to its development. In Montenegro, several past and ongoing (*but as yet separate*) initiatives are noteworthy. Together, these provide a sound basis for the development of a comprehensive sustainable transport strategy (e.g. the Central European Initiative, the NEAP development process, the proposed project on the development of a SEA of transport and transport infrastructure, and the policy advice provided by the University Centre for Engines and Vehicles of Montenegro).

A synthesis of past efforts and a strategic environmental assessment (SEA) of the transport sector would be a good way of developing a sustainable transport policy. Serbia could also received help in developing its sustainable transport policy by participating in the Central European Initiative's Subgroup on Environment and Transport.

Recommendation 13.3:
***Serbia**'s Ministry of Transport and Telecommunication, in collaboration with its Ministry for Protection of Natural Resources and Environment, and **Montenegro**'s Ministry of Maritime Trade and Transport, in collaboration with its Ministry of Environmental Protection and Physical Planning, should develop a sustainable transport policy that fully incorporates environmental considerations through strategic environmental assessments. In Serbia, the spatial plan should be integrated into the policy that will be developed under the new Law on Planning and Construction.*

Serbia *should also actively participate in the Subgroup on Environment and Transport in the framework of the Central European Initiative and in the Transport, Health and Environment Pan-European Programme (THE PEP).*

Transport impacts, in particular poor air quality, are most severe in large urban centres, for instance in Belgrade and Podgorica. As urban air quality must be improved through measures such as switching to cleaner fuels (and away from diesel), promoting rail transport, improving transport system efficiency and promoting non-motorized transport, it is important to develop sustainable transport expertise at the municipal level.

Recommendation 13.4:
Serbia*'s Ministry for Protection of Natural Resources and Environment, in cooperation with its Ministry of Transport and Telecommunications, and* ***Montenegro****'s Ministry of Environmental Protection and Physical Planning, in cooperation with its Ministry of Maritime Trade and Transport, should promote capacity building in the municipalities in transport issues and should assist the secretariats for environmental protection and the persons responsible for making transport-planning decisions to receive training in environmental management and sustainable transport principles.*

Vehicle emissions are increasing throughout both Serbia and Montenegro as vehicle use grows. In Serbia, traffic is already compromising air quality in city centres. In Montenegro, the centre of Podgorica is also threatened by vehicle emissions, which constitute 80% of its total air pollution. These emissions are a significant source of pollutants, almost all of which have negative impacts.

In particular, lead, which is a heavy metal, can cause blood disorders and may affect the liver, kidney, circulatory and nervous systems. It is the age and the model that determine if a specific vehicle is able to use unleaded petrol. Most cars produced after 1989 can use unleaded petrol; some require modifications.

Recommendation 13.5:
The relevant authorities in ***Serbia*** *and* ***Montenegro*** *should develop a plan to phase out the use of leaded petrol as quickly as possible taking into account an existing database (UNECE "Regional Car Fleet Study") to identify the fuelling requirements of all vehicle types in their republics and, if necessary, the changes needed to run the vehicles on unleaded petrol.*

When financial resources are limited, it is generally most effective and efficient to focus on maintenance and defer new development to the extent possible. This is also the environmental perspective, which aims to preserve existing resources. A focus on maintenance requires a good database on the condition of the network. The road and rail administrations are said to have insufficient information systems (e.g. network condition databases) to do their work. These are to be set up in the near future. Environmental monitoring data can be integrated into this type of database, and can be used to identify environmental management priorities.

Recommendation 13.6:
Serbia*'s Ministry of Transport and Telecommunications (Road Administration) and* ***Montenegro****'s Ministry of Maritime Trade and Transport (Road Administration) should:*

(a) Ensure that environmental impact assessment is carried out when building new or reconstructing existing transport infrastructure; and

(b) Ensure that environmental parameters, for instance the results of the EIAs, are integrated into the new database.

Recommendations to Serbia

Water traffic is an important component of a sustainable transport system, and it should be promoted to the extent possible with the appropriate environmental safeguards. Serbia intends to follow the 1996 Strasbourg Convention on Collection, Discharge and Reception of Waste arising from Rhine and Inland Navigation and a "polluter pays" principle for accepting and storing waste. This is a laudable goal. Experience elsewhere has shown that a system of "indirect" taxes integrated into port fees ensures that ship owners use waste management facilities. With an indirect tax, there is no incentive to dump in the water body, as all port users pay an integrated fee and are entitled to waste management services.

Dangerous goods are also transported on waterways. To ensure a high level of safety on its rivers, Serbia should follow the European Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterway (ADN).

This Agreement and its regulations contain provisions on dangerous substances and articles, their carriage in packages and in bulk on board inland navigation vessels and tank vessels, and the construction and operation of such vessels.

Recommendation 13.7:
The Water Traffic Administration, in collaboration with the Ministry for Protection of Natural Resources and Environment and Danube partners, should assess the application of an indirect tax system for shipping waste in Serbia, and should develop such a system, as appropriate.

For river traffic to return to previous levels, war debris must be removed and the rivers must be upgraded. There is likely to be a large volume of debris (e.g. unexploded ordnance, sunken ships) and dredged river sediments. Both may be toxic.

Recommendation 13.8:
The Water Traffic Administration, in collaboration with the Ministry for Protection of Natural Resources and Environment and Danube partners, should assess the toxicity of the river sediments and war debris and make arrangements for clean-up and the appropriate disposal of these materials.

Recommendations to Montenegro

Maritime transport and port development in Montenegro is highly dependant on the land routes (both rail and road) within Montenegro and the connections to Serbia. Ensuring that the road, rail and port systems are complementary (and yielding the desired environmental benefits of more sea freight transport) requires more integrated network planning between the sub-sectors and with Serbia.

Recommendation 13.9:
The Ministry of Maritime Trade and Transport should ensure that its project budgeting and planning reflect integrated planning between sub-sectors and with rail and road routes in Serbia.

The planned Podgorica–Bar project would provide another crossing over Skadarsko Jezero. As Skadarsko Jezero is an ecological site of international importance, and is shared with Albania, the environmental impact of any development project would have to be seriously assessed. This EIA would necessarily also involve the federal level (because of the transboundary issues) and Albania's Environment Ministry and would also have to require wide-ranging public participation.

Recommendation 13.10:
If the Podgorica–Bar project becomes a real option, the Ministry of Maritime Trade and Transport and the Ministry of Environmental Protection and Physical Planning should collaborate on a thorough EIA of the project.

Chapter 14

TOURISM AND THE ENVIRONMENT

14.1 Yugoslavia

At the federal level, tourism is under the responsibility of a small department within the Secretariat for Labour, Health and Social Care.

There is no federal policy or legislation on sustainable tourism, since all aspects related to tourism are the responsibility of Serbia and Montenegro. There used to be a small budget allocated by the Federal government to the Tourist Organization of Serbia (TOS) for promotional activities abroad, but such support no longer exists.

14.2 Serbia

Present situation

Tourism in the former Yugoslavia was developed mainly on the Adriatic coast as seaside, summer tourism. Government action to develop the tourist industry did not at that time include the inland parts of the country such as Serbia. The political events of the past decade have had a marked effect on all sectors of Serbian life and productive activities And, among these, the already limited tourist industry was one of the most affected.

Statistics show that at the end of 1993, when tourism reached an all-time low, domestic tourist traffic was less than half the volume it was at the end of the 1980s, and the number of foreign tourists in Serbia was less than a tenth of what it had been then. The situation began to improve slowly in 1994, but 2001 data still show only 2,129,128 tourists (of whom 242,525 were foreign), which is 51% of the total number and 26% of the number of foreign tourists in 1989 (4,158,200 and 941,300 respectively).

The Ministry of Trade, Tourism and Services reports that the tourist industry at present accounts for about 2.2% of GDP, a value that is still half of what it was in the pre-war period, and the income generated is 10% of 1990 values. It is estimated that more than 100,000 people (4.5% of the total number employed) work in about 4,000 tourist-related enterprises (about 88% of which are private).

Data for the year 2001 indicate that Serbia has a total capacity of 92,490 tourist beds, of which only 35,340 (38%) are in hotels. These figures show a decrease of 23% with respect to 1989.

Table 14.1: Tourist overnights, 1989 - 2001

Year	Total	Domestic tourists	Tourists from Yugoslavia	Foreign tourists
1989	4,158,200	3,216,900	..	941,300
1990	3,949,000	3,067,900	..	881,100
1991	2,823,779	2,476,512	..	347,267
1992	2,669,262	2,522,549	..	146,713
1993	2,084,536	2,014,393	..	70,143
1994	2,201,019	1,981,047	137,932	82,040
1995	2,432,107	2,227,956	113,122	91,029
1996	2,197,395	1,950,184	107,817	139,394
1997	2,143,572	1,904,506	99,131	139,935
1998	2,300,840	2,073,385	84,125	143,330
1999	1,443,712	1,319,949	60,234	63,530
2000	2,166,471	2,001,073	..	165,398
2001	2,129,128	1,886,603	..	242,525

Source : Ministry of Trade, Tourism and Services, 2002.

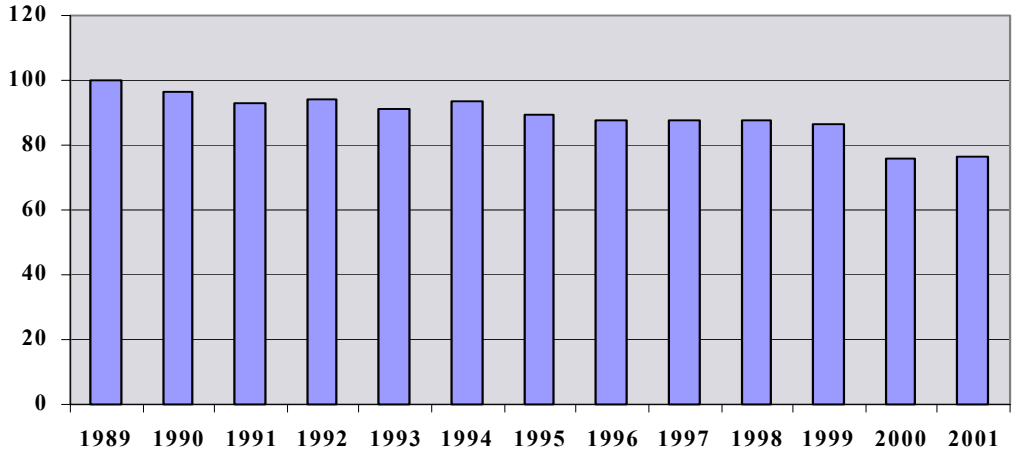
Table 14.2: Accommodation capacity in Serbia, 1989-2001

number of beds

Year	Total	Basic accommodation capacity			Complementary accommodation capacity
		Total	Hotel	Other	
1989	120,540	49,267	37,104	12,163	71,273
1990	116,462	49,214	37,653	11,561	67,248
1991	111,910	48,936	37,716	11,220	62,974
1992	113,262	49,403	38,170	11,233	63,859
1993	109,784	49,558	38,573	10,985	60,226
1994	112,936	49,579	38,609	10,970	63,357
1995	107,684	49,181	38,186	10,995	58,503
1996	105,955	49,125	98,192	10,933	56,830
1997	105,803	49,251	38,437	10,814	56,552
1998	105,438	49,584	38,501	11,083	55,854
1999	104,058	49,751	38,598	11,153	54,307
2000	91,687	46,213	35,016	11,197	45,474
2001	92,490	46,532	35,340	11,192	45,958

Source: Ministry of Trade, Tourism and Services, 2002.

Figure 14.1: Accommodation capacity in Serbia, 1989 = 100



Source: Ministry of Trade, Tourism and Services, 2002.

Since 82% of the hotels were built at least 20 years ago, significant renovation is needed. Of these, 69% are classified as B category, while only 16% are classified as A category. Most of them are in the cities of Belgrade, Novi Sad and other major Serbian towns, which indicate that very few high-level hotels are available in rural areas.

Most hotels are owned by public enterprises and may be privatized soon. However, since Serbia is not yet an obvious tourist destination, and since the political situation has been unstable until recently, foreign investors' interest is still not very keen. In addition the road and rail transport network is very limited as far as fast transit is concerned. This is an important obstacle to further development of the tourist industry.

Environmental problems

Some of the most expensive hotels, with the highest standards, are in the Kopaonic National Park area and are ecological disasters. In most areas with high seasonal tourism, a strong negative impact on natural resources derives from illegal and uncontrolled construction; the pollution of rivers in the vicinity of tourist resorts; high levels of energy consumption; and a lack of facilities for the proper management of both solid and liquid waste.

An environmental impact assessment (EIA) is required by law for the construction of any new tourism facility. However, this is meaningless if regulations are not enforced. Proper and efficient planning for the management of these infrastructure problems is essential for the development of a sustainable tourist industry (see also chapter 1, on the decision-making framework for environmental protection).

Sustainable tourism includes activities with a low environmental impact such as rural tourism, trekking and cycling. At present, there is insufficient infrastructure in Serbia to support such diversified tourism. Providing good-quality rural hotels or guest houses, hiking trails and cycling circuits would help to support the development of sustainable tourism. In addition, efficient and adequate planning for proper waste management and other support services to guarantee proper protection of the surrounding environment and natural resources is essential.

Prospects for sustainable tourism development

In the past, domestic and foreign tourists were attracted primarily to the mountains, to sports activities and to spas for health-related activities. Although these are the areas with the most obvious development potential, the wide variety of natural and cultural resources in Serbia constitute a valuable base on which to diversify and develop high-level sustainable tourism, including river tourism on the Danube, cultural tourism, transit tourism and ecotourism.

This is especially significant in the light of the changing trends of Western tourism, which show a tendency for people to move away from standard mass tourism to more individual, sophisticated and eco-oriented holidays. This requires, as a first step, a sound knowledge of the areas with the best tourism opportunities (e.g. areas of cultural heritage, nature tourism and rural tourism). At the moment, there is no inventory of these areas.

Policy objectives and management

The policy framework

Serbia issued its "Strategy of Tourism Industry Development" in March 1999. It contains the following objectives for the long-term development of the tourist industry:

- The intensification of overall development using existing facilities fully;
- The faster and greater penetration of Serbia in the international market as a tourist destination;
- The creation of conditions for the further development of a domestic tourist industry;
- The improvement of the overall organization for more efficient management of tourist industry development; and
- The development of economic conditions in tourism.

To achieve these objectives, the Strategy identifies a number of actions to be taken, including support to the tourist industry through fiscal policy, incentives for exports and imports and ad hoc financial credits, the renovation of existing facilities and the construction of new ones up to international standards. It would also improve agency service and booking technologies and train tourist operators. Specific areas targeted for tourist development are big city tourism, mountain tourism, spa tourism, tourism on the Danube and special-interest tourism, such as cultural heritage, rural holidays and ecotourism.

The Strategy addresses the sustainability of the tourist industry in relation to the protection of the environment. It acknowledges that inadequate attention was paid to environmental protection in the past, and it states that the European Charter for Sustainable Tourism in Protected Areas will be taken into account in the development of the Serbian tourist industry. Additional concepts of sustainability are included in the Spatial Plan Law, which contains a framework for the adoption of sustainable tourism strategies through regional and local plans. A master plan for the implementation of the Strategy has not yet been adopted, although the Tourist Organization of Serbia has drafted a proposal for it.

In 1997, the former Directorate for Environmental Protection issued an Action Plan for Sustainable Development in Protected Areas, focusing on pilot projects for sustainable tourism in selected protected areas, education programmes on the protection of natural areas and cultural heritage and the promotion of regional products. However, this document has never been adopted.

The legislative framework

A number of laws, draft laws and regulations cover different areas related to the sustainability of the tourist industry, including the following:

- The draft law on the environmental protection system includes articles to protect natural resources and plan for their rational exploitation;
- The Law on Tourism is being upgraded to European standards. The draft should be ready by May 2002 and submitted to the National Assembly in the autumn of 2002. This draft law, however, does not currently contain any reference to eco-standards in the tourist industry;
- A law on ski slopes is being developed under the supervision of a board that includes not only the Ministry of Trade, Tourism and Services and the Ministry of Education and Sport but also the Ministry for Protection of Natural Resources and Environment (as well as the World Ski Association);
- The 1993 Law on Natural Parks sets rules and regulations for the protection of the national parks and limits the activities that are allowed inside them. At present, there is no entrance fee for visiting the national parks, and some of them, for example Kopaonic, are suffering significant pressure from the surrounding mountain tourist industry that has developed without adequate infrastructure planning;
- The Regulations on the Categorization of Tourist Places defines criteria for the categorization of areas based on tourist importance, but it does not consider ecotourism; and
- The 1994 Regulations on the Classification, Minimal Conditions and Categorization of Catering Facilities.

There is no strategy or master plan for sustainable tourism that encompasses all of these different regulations. In the absence of a framework, specific sectoral plans, such as those for the sustainable development of tourism in national parks, or tourism along the Danube or in rural areas, have not been drawn up.

Economic instruments

There is a budget for national parks, and the Law on Natural Parks indicates that a tax is to be paid by the public enterprises using facilities within protected areas, but there are no economic instruments to support the development of sustainable tourism.

The institutional framework

The Ministry of Trade, Tourism and Services is directly responsible for Serbia's tourist policies and legislation, but a number of other institutions also have responsibilities for sustainable tourism policy. These include:

- The Ministry of Culture: cultural heritage; and the education and training of operators, the education of schoolchildren, and raising public awareness about the environment and ecotourism.
- The Ministry for Protection of Natural Resources and Environment: national parks and protected areas; environmental impact studies for new tourist structures; the protection and sustainable use of natural resources; the identification of natural regions of significance for Serbia; and the improvement, use and protection of forests and game.
- The Ministry of Construction and Urban Planning: development planning issues.
- The State Enterprise for Forest Management "Srbija sume": hunting tourism and the rearing of pheasants; and congress tourism, schoolchildren and village tourism.

Interviews with representatives of these different institutions made it clear that there is virtually no coordination and no sharing of information or related activities among the ministries on similar issues. There is a similar lack of information exchange between communities and NGOs that are active in tourism. Such a lack of coordination among institutions, organizations and local communities is a significant obstacle to coherent planning and implementation.

Education and capacity-building

There are institutions for training in the tourism sector. Novi Sad University has a tourism faculty that includes all aspects of sustainable tourism. The Ministry of Education and Sport runs a programme called "Schools in nature" for young children, and, since 1995, it has been obligatory to teach environmental protection issues in primary schools.

There are two higher schools associated with tourism, one for catering and the other for tourism, but neither has a curriculum that addresses sustainable tourism. Seminars for hotel operators, teachers and others are held within the Yugoslav Tourist Agency (YUTA) to raise awareness of sustainable and ecotourism.

Sustainable tourism indicators

Statistical data on hotels and tourist numbers are available from the Ministry of Trade, Tourism and Services. These are divided into country of origin and tourist destination. There are no data on national park use.

Data such as the ratio of overnights per tourist arrivals, the ratio of overnights per resident, or the annual value of trade in catering for residents, are not collected at the moment. These are important indicators to develop the monitoring of sustainable tourism.

14.3 Montenegro

Present situation

Although not as developed as on Croatia's Adriatic coast, in the 1980s the tourist industry in Montenegro accounted for a significant part of its GDP with an overall number of overnights close to 11 million.

The political events of the past ten years have seriously damaged the sector and tourism has decreased to 5 million overnights, mostly limited to domestic (including Serbian) tourists focused on seaside summer tourism. West European tourists has practically disappeared and are only slowly returning.

Due to its natural resources and beautiful coastline, tourism is considered to be one of the main industries to be developed in Montenegro in the next 10 to 20 years, and it is given the highest priority.

Statistics in the Tourist Master Plan for Montenegro, prepared by the German Investment and Development Company (DEG) in March 2001, indicate that of a total number of 95,000 beds available in Montenegro at present, only 26,000 (27.5%) are in hotels, and of these, only about 1% is considered to be of a standard suitable for international markets. Most hotels are owned by public enterprises. In many cases, the land on which they were built was expropriated from private owners, who are now reclaiming their property. This issue, which is being addressed by the preparation of a new law, currently stands in the way of foreign investments.

Another constraint is the transport infrastructure, which is inadequate even for the existing tourism. Interviews with local tourist operators in Budva showed that there was a problem of intense traffic during the peak summer months to such a degree that it becomes difficult to transport tourists from Budva hotels to surrounding destinations such as Kotor and Saint Stefan. Existing roads are slow transit roads, and the standards of the only two airports equipped to receive international flights are very basic.

Environmental problems

In the main coastal tourist destinations such as Budva, unauthorized building developments have ruined many of the natural characteristics of the sites. Furthermore, such illegal development means both that there has been no environmental planning and that construction has not been accompanied by the essential infrastructure. Basic resources like water and power are short during peak tourist periods.

Sewage is the main problem on the coast. At the moment, this is being partially addressed by the introduction of beach toilets with no outlet to the sea. The Bay of Kotor has no sewerage network; all the houses or groups of houses have their own outlets and discharge directly into the sea. There are no waste-water treatment plants, and the outlets along the coastline are in a bad condition. Budva has four outlets, of which the main one is 2 km out to sea, but the total capacity is still that of 1979, after the earthquake. No upgrading of the drainage systems and outlets has taken place in 23 years. There are other problems with all the aspects of waste management.

If planning regulations are not enforced, Montenegro will lose its potential as a major tourist destination for foreign as well as domestic tourists.

Sustainable tourism

As in Serbia, Montenegro does not yet have the required infrastructure to support ecotourism activities such as mountaineering, trekking, rural tourism and sailing.

No effort is being made to support local rural activities by including their products in a sustainable tourism development plan for Montenegro. For example, it was pointed out that the Montenegrin airline is serving Serbian honey on its planes, while local rural communities producing honey do not have the capacity to commercialize it. The same is true for milk; despite the high local production capacity, milk is currently imported. Attention should be paid to local production and efforts made to organize cooperatives to help sustain local rural communities (see also chapter 12, on agriculture and the environment).

Sustainable tourism development

Montenegro is a small beautiful republic with a huge variety of natural attractions that have not yet been developed. These include sandy beaches, a rocky coastline and fjords, dramatic mountain scenery enhanced by lakes and river canyons. All of this is enriched by historical sites left by several different cultures that have inhabited the region throughout the centuries.

The Tourism Master Plan for Montenegro (May 2001) has identified the following five main tourist regions:

- The sandy beach of Ulcinj, which, 13 km long, is the only sandy beach on the eastern Adriatic coast;
- The unique Boka Kotorska fjord;
- The rocky coast between Tivat and Ulcinj, which offers many pebble beaches;
- Skadarsko Jezero; and
- The inland mountain region.

Montenegro is endowed with all the basic elements needed for a very high-level, sustainable tourist industry, such as is not found anywhere else in Europe. However, no specific strategy has yet been developed for the immediate future. This is a cause for concern, because there are likely to be intensive efforts to develop the tourist industry without any reference to the environment or sustainability.

Policy objectives and management

The policy framework

The above-mentioned Tourism Master Plan includes all aspects related to the tourist industry such as general infrastructure (transport, waste management, waste-water treatment and water and power supply) and highlights the importance of natural resource conservation. The strategic aim of the Tourism Master Plan is to turn Montenegro into a high-quality summer tourist destination and a provider of specialized, niche tourist products in the winter. It foresees the development of a hotel capacity of 50,000 beds by 2010 and 100,000 beds by 2020, mostly for coastal charter tourism.

A coordination committee for the Master Plan has been appointed and includes all relevant ministries, the municipalities, the main tourist companies, the Public Enterprise for Coastal Management, and the national organization for tourism. The chair of the committee is the deputy president of Montenegro. A smaller committee, composed of only 10 people, meets every 15 days for urgent matters. It includes representatives of the office of the Deputy Prime Minister, the Ministry of Tourism, the Ministry of Environmental Protection and Physical Planning, the Public Enterprise for Coastal Management and private tourist companies.

Development programmes are now being finalized for two of the tourist areas identified by the Master Plan, Kotor Bay and Ulcinj beach. The plans will then be proposed to the local communities for approval and development. The project teams that are responsible for these plans do not include representatives of the Ministry of Environmental Protection and Physical Planning. Montenegro might wish to consider inviting high-level ecotourism experts to design a sustainable development policy to be integrated into the existing Master Plan before implementing specific site plans.

A Plan for the Future of Montenegro's National Parks and Private Enterprise Development was prepared by national park and forest service professionals from the United States (through Flag International) in March 2002. This strategic plan offers a development approach that is complementary to the Tourist Master Plan. At the moment, however, it has no official status.

A strategic spatial plan has been drafted for the whole coast for the next 20 years. This includes guidelines for individual municipal plans and marine transport. It also includes environmental protection concepts for the coast. For example, in the wetland area of Ulcinj, the plan does not allow for any building that might impede bird migration. It also recognizes, for the first time, a sea and underwater area for the protection of marine life and foresees the creation of special underwater parks. Marine areas are not included in the 1978 Law on Nature Protection.

The strategic spatial plan for the coast identifies seven important locations for tourist development, to be studied in greater detail. One of the selected areas, the coastal wetland of Solala near Tivat, is not yet protected, but the plan foresees that the only activity allowed there will be aquaculture.

The planning process was carried out in the traditional way and does not introduce the sustainable development criteria that are included in the recommendations of the European Code of Conduct for Coastal Zones and the UNEP Priority Action Plan (PAP) Regional Activity Centre (RAC) guidelines for integrated coastal zone management. However, it is considered to be more restrictive and protective of the environment than the Tourism Master Plan. At the moment, the strategic spatial plan is just a draft.

International conventions are dealt with by the Federal Government, but given the diverging interests of Montenegro's Government and the Federal Government, it has been difficult to negotiate conventions specific to the Mediterranean Sea.

Ratification of the Barcelona Convention and membership of the Mediterranean protection and assistance programmes, such as the UNEP Mediterranean Action Plan (MAP) and the World Bank Mediterranean Environmental Technical Assistance Program (METAP) would encourage the Montenegro Government to implement costal protection measures and would make international aid resources available to it.

The legislative framework

The Law on Tourism (No. 32/2002) includes new standards for catering, but it does not appear to contain any concepts related to sustainable development. This would have been a good opportunity to introduce eco-standard concepts in the tourist industry.

Economic instruments

There is a tourist tax on hotel and other tourist accommodation. Of the amount collected, 7% goes to the municipality and 93% to Montenegro's budget, but municipalities use the money for priorities other than tourism and the environment. In addition, there is no reliable mechanism to ensure collection of this tourist tax, and a significant amount of existing accommodation is unregistered. The Ministry of Tourism organizes local inspection bureaux to try to enforce regulations.

No entrance fees are charged for national parks at present.

The institutional framework

Montenegro has a Ministry of Tourism directly responsible for tourist policies and legislation but, like Serbia, a number of other institutions are also involved in sustainable tourism policy. These include the following:

- The Ministry of Environmental Protection and Physical Planning: environmental protection issues and aspects related to the management of national parks and protected areas; environmental impact studies for new tourist structures for development planning issues.
- The Ministry of Maritime Trade and Transport: responsible for all matters which concern the sea.
- The Ministry of Culture (Sector of Cultural Heritage): issues related to the development of cultural tourism opportunities.
- The Ministry of Education and Science: the education and training of operators, the education of schoolchildren; and raising public awareness about the environment and ecotourism.

The National Tourism Organization serves as an operative branch of the Ministry of Tourism and is financed by the Government (about €450,000 for 2002). It has a central office in Podgorica and ten local offices, of which seven are on the coast. The Organization is making a huge effort to raise the local population's awareness of the importance

both of maintaining the surrounding environment ("Let it be clean" campaign) and of tourism at the community level.

Coastal management is the responsibility of the Public Enterprise for Coastal Management, whose board of directors includes representatives of the Ministry of Maritime Trade and Transport, the Ministry of Environmental Protection and Physical Planning, the Ministry of Tourism, the Ministry of Agriculture, Forestry and Water Management and local municipalities. The Enterprise is responsible for the implementation of the 1992 Law on the Coastal Zone.

Preparation of the beaches and of the coastal zone for the tourist season is also the responsibility of the Public Enterprise for Coastal Management. This is done by leasing parts of land to either public or private companies or individuals for tourist activities through contracts that contain regulations included in the Ministry of Tourism Code for Beaches.

Environmental protection has only recently been introduced as a part of the mandate of the Enterprise. In fact, one of its leasing conditions is monitoring the quality of the sea water through the Institute of Marine Biology in Kotor for biological parameters and through the Centre for Ecotoxicological Research in Podgorica for chemical parameters.

Biological monitoring by the Institute of Marine Biology is active in 55 beach locations while chemical monitoring by the Centre for Ecotoxicological Research is carried out in 8 locations that are mostly urban and port sites. The parameters monitored are those indicated in the monitoring guidelines of the Ministry of Agriculture, Forestry and Water Management. The Enterprise has no direct influence on water management companies.

Education and capacity-building

There are secondary schools for tourism in Budva, Herzegnovi and Podgorica. A university degree in tourism is offered by the University of Kotor. In addition, a secondary school for spa medicine is available at the health centre of Igalo. Sustainable tourism concepts do not appear to be included in the curricula of any of these schools, all of which are regulated by the Ministry of Education and Science.

No specific training appears to be available for sustainable tourism and no workshops or seminars are available for tourism operators, teachers, students or for general awareness-raising among the population.

Sustainable tourism indicators

Statistical data on hotels and tourism are available from the Ministry of Tourism. These are divided into country of origin. There are no data on national park entrances.

Data such as the ratio of overnights per tourist, the ratio of overnights per resident, or the annual value of trade in catering for residents are not collected.

14.4 Conclusions and Recommendations

Recommendations to the Federal Government

Ratification of the Barcelona Convention and membership in the Mediterranean protection and assistance programmes, such as the UNEP Mediterranean Action Plan (MAP) and the World Bank Mediterranean Environmental Technical Assistance Program (METAP) would help the Montenegrin Government to implement coastal protection measures. It would also make international resources available to it (see chapter 4, on international cooperation).

Recommendations to Serbia and to Montenegro

There are many laws and regulations addressing tourism-related issues, from spatial planning, coastal zone management and environmental protection to catering, ski slopes, spas and school programmes. However, there is no overall sustainable tourism policy that could provide a cohesive framework and ensure that sustainability criteria are consistently applied in all relevant laws and regulations affecting tourism development.

Once a framework policy has been established, it is important to develop a general master plan for sustainable tourism and a series of individual master plans for specific sites. In order to provide baseline data for the master plan, it is important to make an inventory of all sites of interest (including sites with potential for cultural heritage, rural tourism, river tourism, industrial heritage, nature tourism, and spas).

The development plans that are being drafted and will soon be submitted to local communities for approval do not appear to contain sustainable development criteria. Top priority should be given to sustainable development in order to safeguard natural resources and, in particular, Montenegro's unique potential for a "different type" of tourism development.

Recommendation 14.1:
***Serbia**'s Ministry of Trade, Tourism and Services, in cooperation with its Ministry for Protection of Natural Resources and Environment, and **Montenegro**'s Ministry of Tourism, in cooperation with its Ministry of Environmental Protection and Physical Planning, should:*

(a) Each prepare and submit for approval by the Government a policy for sustainable tourism. The policy should serve as a framework for all tourist-related activities. In Montenegro, it should be consistent with its declaration as an Ecological State (1991);

(b) Develop a tourism master plan, also based on the overall policy for sustainable tourism, to allow for appropriate economic, spatial and resource planning and the development of the necessary infrastructure in tourist areas. In Serbia, the master plan should be harmonized with the draft action plan for sustainable tourism in protected areas. In Montenegro, where a tourism master plan has already been drafted, the Ministry should ensure that it reflects the (new) sustainable tourism policy;

(c) On the basis of the policy, develop guidelines for tourism development at the local level and introduce eco-standards for tourist premises;

(d) On the basis of the policy, identify the important sustainable tourism indicators and provide the means for monitoring, collecting and evaluating the data accordingly; and

(e) In cooperation with the Ministry of Culture, make an inventory of all sites of tourist interest. As the sites are identified, individual plans for their sustainable development should also be prepared (e.g. for sustainable tourism in national parks).

(see also recommendation 9.4)

There are economic instruments for natural resources management in Serbia, including taxes and payments for use of land and forests, and fishing and hunting. There are, however, no economic instruments to support the development of sustainable tourism in Serbia and no charge for entrance into national parks. Serbia could raise revenue through an eco-tax and then spend it on environmental protection projects in protected areas and on improving the infrastructure that is now damaging the environment.

In Montenegro there is currently a tourist tax, although there is no evidence that any of it is applied toward sustainable tourism. At this important moment for shaping the Montenegrin tourist industry and providing for its future development, it is essential that funds should be made available to ensure its sustainability.

Recommendation 14.2:
***Serbia**'s Ministry for Protection of Natural Resources and Environment and **Montenegro**'s Ministry of Environmental Protection and Physical Planning should establish the following economic instruments to support sustainable tourism:*

- *Entrance fees at national parks;*
- *Fiscal incentives for tourist premises that implement eco-standards, such as "green hotels" that give special attention to the conservation and protection of resources such as water and energy.*

(see also recommendation 9.4)

Concepts of sustainable tourism are not included in the curricula of either the two Higher Schools for Tourism and Catering in Serbia or the Schools for Tourism in Montenegro. It is important that persons directly involved in tourism are educated in concepts of sustainability and environmental protection, but it is just as significant that municipal authorities and tourists are made aware of such important issues. Therefore, the awareness and education campaign effort should address the public at large. Seminars and workshops should be held for operators of the tourist industry, teachers, students and local authorities to raise general awareness of sustainable tourism and ecotourism.

Recommendation 14.3:
***Serbia**'s Ministry of Trade, Tourism and Services, in cooperation with its Ministry for Protection of Natural Resources and Environment, and **Montenegro**'s Ministry of Tourism, in cooperation with its Ministry of Environmental Protection and Physical Planning, should:*

(a) Carry out widespread campaigns to raise awareness of sustainable tourism particularly among hotel managers, tourist agencies, tourists and municipal authorities. The campaign should make use of workshops, community meetings, brochures and posters, among other media; and

*(b) In cooperation with **Serbia**'s Ministry of Education and Sport and **Montenegro**'s Ministry of Education and Science, introduce sustainable tourism development into the curricula of the higher schools for tourism and catering.*

Recommendations to Serbia

A number of ministries and other organizations are responsible for different areas of importance to tourism. However, there is very little coordination among them, and they rarely share information. At the same time, individual projects are being developed locally by non-governmental organizations. Interaction between the different government bodies and cooperation with the local communities would allow for a more efficient use of human and economic resources and the development of more effective, multidisciplinary projects.

Recommendation 14.4:
*The Government of **Serbia** should establish an inter-ministerial body on sustainable tourism that would also include representatives of local authorities and appropriate non-governmental organizations.*

Recommendations to Montenegro

In developing sustainable tourism, it is essential that plans should be formulated within the context of coastal zone management (see recommendation 5.7). In addition, more support should be given to the production of local food and other products. Efforts should also be made to organize cooperatives to help sustain local rural communities. A survey of production of rural communities may help in this regard.

Recommendation 14.5:
The Ministry of Tourism, in cooperation with local authorities, should undertake a survey of local products that could be supported and included in a sustainable tourism development plan.

Montenegro has established a coordination committee to implement its master tourism plan. This is an important step, but it is made up of central government representatives. Interaction between the different government bodies and local communities would allow for a more efficient use of human and economic resources and the development of multidisciplinary projects. There are many very highly motivated and qualified professionals working at the local level. The committee should work with such people to establish strong local ties and develop sensible and sustainable local development strategies.

Recommendation 14.6:
The coordination committee established for the master tourism plan should establish smaller, more agile thematic working groups, including one dedicated to sustainable tourism and development. The committee should include representations of both local communities and non-governmental organizations.

The situation related to waste management, waste-water treatment, power and water supply and transport in the main tourist areas of Montenegro is critical. Strategic master plans to solve such issues must be given top priority if a tourist industry is to develop at all. Sustainable development criteria should be included in such plans to make the declaration of Montenegro as an ecological State credible (see chapters 5 on management of water resources; 7 on waste management; 11 on energy and the environment and 13 on transport and the environment).

Chapter 15

HUMAN HEALTH AND THE ENVIRONMENT

15.1 Status of human health

Population structure

The population structure in various areas of Yugoslavia has changed within a relatively short period of time. This is due to the series of conflicts since 1991 which has resulted in a number of internally displaced persons and refugees. Approximately 10% of Yugoslavia's inhabitants are refugees from Croatia or Bosnia and Herzegovina, or internally displaced persons from Kosovo and Metohija. The last census of the population was in 1991, So for all ratios depending on the size or structure of the population, the denominator might be incorrect after this date. Data collection in Serbia and Montenegro is of varying quality. The quality of data collection within Kosovo and Metohija might be especially questionable. Consequently, the most recent statistics should be treated with some caution.

Basic population and health data

The population of Yugoslavia is estimated to be 10,629,358. About one fifth is under 15 years of age and the percentage of population in this age group differs widely in the country, from 32.8% in Kosovo and Metohija to 17.4% in Vojvodina. The live birth rate per 1,000 inhabitants fell between 1981 and 1999 from 16.3 to 11.7. The lowest live birth rate, 9.3, is in central Serbia; the highest, 19.6, is in Kosovo and Metohija. The death rate per 1,000 inhabitants increased from 9.2 in 1981 to 10.7 in 1999, again with large regional differences: the highest death rate, 14.9, was in Vojvodina, which also has the greatest percentage of older people; it was lowest, 3.9, in Kosovo and Metohija, where the population is relatively young.

Since the death rate is higher than the birth rate in central Serbia and Vojvodina, the population is decreasing. In both Montenegro and Kosovo and Metohija, the birth rate exceeds the death rate.

Infant mortality, expressed as deaths per 1,000 live births, is an important indicator of the quality and accessibility of the health care system. In Yugoslavia, infant mortality decreased markedly from 34.3 in 1981 to 13.9 in 1999. But there was a huge difference, with Kosovo and Metohija having an infant mortality rate of 62.9 in 1981, falling to 18.2 in 1998, but still much higher than the lowest rate of infant mortality in Vojvodina (10.2).

In table 15.2 the basic population data of Yugoslavia is compared with those of all the neighbouring countries, the European Union average (EU), and the Central and East European average for the year 2000. The general basic population data show that Yugoslavia is on a level with its neighbours and Central and Eastern Europe, but below the EU average.

Morbidity

In Yugoslavia the relative shares of the causes of morbidity are shifting towards patterns observed in the developed countries. Non-communicable diseases (e.g. cardiovascular diseases and cancer) are becoming relatively more widespread than infectious diseases. Almost half (45.3%) of the diseases treated in outpatient facilities are related to the respiratory system. Other causes of morbidity include diseases of the genital-urinary system (9.7%), the muscular-skeletal system (6.0%) and the digestive system (5.1%).

Vaccination coverage is high, but decreasing. Coverage of the population with diphtheria-tetanus-pertussis (DTP) vaccination declined from 94.0% in 1998 to 89.2% in 1999; measles vaccinations and polio vaccinations also declined (from 89.3% to 86.6%, and from 89.1% to 88.8%, respectively), largely due to a lack of financing. At highest risk are the children in Kosovo and Metohija, and refugees and internally displaced persons throughout the country.

The five most frequent infectious diseases in 1999 were influenza, varicella, intestinal bacterial infections, scabies and pharyngitis/tonsillitis. The incidence of infectious diseases in Yugoslavia varied between 1989 and 1999, but no systematic

trend is visible. There could be under-reporting of these infectious diseases due to the lack of medical and laboratory resources.

Morbidity in Yugoslavia is similar to that in the neighbouring countries and the Central and East European average. No special trends are obvious.

Development of selected causes of death

The five main causes of mortality in Yugoslavia in 1999 were diseases of the blood circulatory system (56.6% of the total deaths), neoplasms (17.2%), symptoms and ill-defined conditions (7.6%), injuries and poisoning (4.5%) and diseases of the respiratory system (4.4 %). More than 90% of all deaths recorded in that year were attributed to one of these five categories. In table 15.6 the numbers and distribution of the main causes of death are shown in more detail. Virtually all of these have a potential relationship to environmental problems, but there has never been a study in Yugoslavia to estimate the attributable risk of environmental pollutants on the burden of diseases.

There is no systematic registration of epidemiological cancer. The epidemiological atlas of malignant diseases does show figures and trends in the distribution of malignant diseases within the different areas over time. Lung cancer is the main cancer for men (21.7% of all cancers) and breast cancer is the main cancer for women (29.4%). However, no environmental data have been combined with these medical data.

Table 15.1: Basic population data

	Yugoslavia	Montenegro	Serbia			
			All Serbia	Central Serbia	Vojvodina	Kosovo and Metohija
Total population						
1971	8,976,195	529,604	8,446,591	5,250,365	1,952,533	1,243,693
1981	9,897,986	584,310	9,313,676	5,694,464	2,034,772	1,584,440
1991	10,394,026	615,035	9,778,991	5,808,906	2,013,889	1,956,196
1999	10,629,358	658,258	9,978,600	5,763,426	1,958,499	2,188,083
2000	10,633,500	..	..	..	..	..
2001	10,538,000	..	..	..	..	..
Per cent of population under 15	21.0	22.7	20.8	17.5	17.4	32.8
Live births per 1000 inhabitants						
1981	16.3	17.6	16.2	13.2	13.7	30.2
1991	14.6	15.6	14.6	11.6	11.4	26.2
1999	12.1	13.6	12.0	9.3	9.5	19.6
2000	11.9	..	..	..	..	..
2001	12.3	..	..	..	..	..
Deaths per 1000 inhabitants						
1981	9.2	6.3	9.4	9.6	11.5	6.1
1991	9.8	6.4	10	10.8	13.2	4.3
1999	10.7	8.3	10.9	12.5	14.9	3.9
2000	11.1	..	..	..	..	..
2001	10.8	..	..	..	..	..
Infant mortality per 1000 live births						
1981	34.3	22.8	35	22.8	17.5	62.9
1991	20.9	11.2	21.6	15.4	12.3	33.6
1999	13.9	13.4	14.2	11.2	10.2	18.2
2000	13.18	..	..	..	..	..
2001	..	..	..	..	..	..

***Sources*:** Federal Republic of Yugoslavia. Federal Institute of Public Health. Health Statistical Yearbook 1999 CD-Rom. 2002 and; WHO. Health for all database, 2002.

Note: 1998-2001 data are not available for Kosovo and Metohija; therefore 1997 data for Kosovo and Metohija are used for the Yugoslav estimates for that period.

Table 15.2: Health for all data from WHO for 2000, Yugoslavia and neighbouring countries

Indicator	Yugoslavia	Central and East European average	EU average	Albania	Bosnia and Herzegovina	Bulgaria	Croatia	Hungary	Romania	The former Yugoslav Republic of Macedonia
% of population aged 0-14 years	20.1	18.9	17.0	32.7	24.3	15.7	19.8	17.0	17.8	22.3
% of population aged 65+ years	13.6	12.6	16.1	6.1	6.3	16.3	12.5	14.7	13.6	10.1
% of regular daily smokers, age 15+ years	47.0	38.3	29.3	39.0	n.d.	n.d.	30.3	41.8	n.d.	36.0
% of total energy available from protein	11.6	11.9	12.2	13.5	11.1	12.3	9.9	10.4	12.4	10.2
Average number of calories per person/day (kcal)	2,805	3,267	3,460	2,717	2,959	2,847	2,617	3,436	3,254	2,877
Clinically diagnosed AIDS incidence per 100,000	0.7	0.6	2.4	0.1	0.1	0.2	0.4	0.3	2.2	0.2
Crude death rate per 1,000 population	11.1	10.5	9.9	5.3	6.7	14.1	11.5	13.5	11.6	8.5
Deaths due to work-related accidents per 100,000	0.8	1.6	1.6	n.d.	n.d.	1.1	0.6	1.5	2.1	0.3
Hospital beds per 100,000	540.6	679.5	595.7	300.4	323.6	741.1	615.2	840.7	743.6	505.7
Infant deaths per 1,000 live births	13.2	10.9	4.9	11.6	15.0	13.3	7.4	9.2	18.4	11.8
In-patient care admissions per 100	10.6	18.3	18.4	7.7	8.0	15.4	15.7	26.0	22.4	9.7
Life expectancy at birth, in years	72.6	73.1	78.3	74.9	72.7	71.7	73.0	71.5	71.3	73.4
Life expectancy at birth, in years (female)	75.1	76.5	81.4	78.0	76.0	75.1	76.7	75.8	75.0	75.7
Life expectancy at birth, in years (male)	70.3	69.3	75.1	72.0	69.5	68.5	69.1	67.2	67.7	71.2
Live births per 1,000 population	11.9	10.2	10.7	16.1	10.4	9.0	10.0	9.7	9.8	14.5
Mid-year population	10,538,000	120,867,392	376,976,992	3,145,000	4,067,000	7,866,000	4,655,000	9,917,000	22,408,393	2,044,000
Persons injured, work-related accidents per 100,000	214.6	398.0	1308.2	n.d.	n.d.	93.1	452.4	281.5	29.3	179.8
Physicians per 100,000 population	213.2	249.9	387.5	133.2	142.2	336.9	238.3	361.4	188.9	219.9
SDR, all causes, all ages, per 100,000	1037.9	1011.7	1045.9	1005.5	1008.4	1145.8	1084.1	1123.5	1097.1	1014.5
SDR, cerebrovascular disease, all ages per 100,000	162.7	147.8	65.4	191.4	n.d.	203.6	176.4	149.1	215.5	192.8
SDR, diseases of circulatory system, all ages per 100,000	576.2	537.5	261.0	518.9	530.8	737.1	572.7	548.4	662.7	582.2
SDR, external cause injury and poison, all ages per 100,000	42.0	63.8	40.2	59.2	38.6	52.4	65.5	84.9	63.0	37.9
SDR, ischaemic heart disease, all ages per 100,000	115.5	182.6	104.3	125.2	n.d.	193.6	201.1	238.5	230.6	109.7
SDR, malignant neoplasms, all ages per 100,000	173.4	206.2	185.6	137.9	166.8	150.1	249.0	278.8	175.0	163.6
SDR, trachea/bronch/lung cancer, all ages per 100,000	39.2	46.3	37.9	34.2	n.d.	29.0	53.1	67.3	35.7	32.9
Total fertility rate	1.7	n.d.	n.d.	2.4	1.56	1.27	1.5	1.33	1.3	1.9
Total health expenditure as % of GDP	7.6	5.8	8.5	2.8	3.5	4.7	9.0	6.8	2.6	4.5
Tuberculosis incidence per 100,000	26.9	50.6	11.5	19.4	65.6	41.0	37.2	30.7	122.4	31.6

Source : WHO. Health for all database, 2002.

Table 15.3: Morbidity in Yugoslavia – infectious diseases 1989-1999

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Tuberculosis (A15-A19)*	5,045	4,149	4,502	3,771	3,843	3,606	4,169	4,507	4,062	4,234	3,825
Typhus abdominalis (A01)	32	34	48	18	34	155	101	28	31	40	38
Salmonellosis (A03)	2,788	3,223	3,197	3,102	3,419	4,723	5,792	6,154	4,282	5,070	3,520
Hepatitis (B15-B19)	7,276	6,078	5,730	4,868	5,387	8,347	7,711	4,475	3,390	3,995	5,810
Poliomyelitis (A80)	3	3	7	12	7	1	3	24	0	0	0
Tetanus (A33-A35)	23	23	34	23	26	32	27	29	27	20	34

Source: Federal Statistical Office of Yugoslavia. Statistical Yearbook of Yugoslavia. Belgrade, 2001.
Note: *Newly reported cases during a year.

Table 15.4: Causes of death in Montenegro, 1999

	Groups of diseases	Deaths	%
Heart diseases of lung origin and other heart diseases		983	18.23
Blood vessel diseases in the brain	(126-169)	704	13.05
Ischaemic heart diseases	(120-125)	657	12.18
Malignant tumors of tracheus and lung	(C33-C34)	227	4.21
Injures to the head, neck, ribcage and abdomen	(S00-S39)	151	2.28
Diabetes mellitus	(E10-E14)	115	2.13
Other diseases of reproductive-urinary system	(N17-N98)	90	1.67
Chronic diseases of lower bronchial tubes	(340-347)	86	1.59
Malignant tumors of colon, rectum and anus	(C22)	59	1.09
Neoplasma malignum gasteris	(C16)	43	0.8
Total above		3,115	57.23
Total deaths in 1999		5,393	

Source: Institute for Public Health. Statistical Yearbook 2000.

Health of internally displaced persons and refugees

In a report of the Institute of Public Health of Serbia on "Health Status, Health Needs and Utilisation of Health Services in 2000", nutrition for the refugees was found to be insufficient; more than 25% had anaemia and 14% of refugees in collective centres were underweight. In general, meat, milk and fresh vegetable consumption is too low. More than half of the refugees and internally displaced persons were active smokers. Many diagnosed diseases were not treated medically.

15.2 Health and Environment

Important environmental polluters are mining and the mining industry, industrial facilities (petrochemical, chemical and heavy industry), thermal power plants and their tailings, heating in winter and vehicle traffic. Industrial production fell drastically during the past decade. This contributed to the reduction of certain pollutants, but facilities still operating with inappropriate environmental standards continue to contribute to air, water and soil pollution. Within the past decade environmental health issues have not had top priority in Yugoslavia. Political, social and economic issues have dominated.

Health effects of air pollution

The worst environmental health problem in the Balkans is respiratory health, due to high tobacco consumption and poor outdoor air quality. Unfortunately, there has been no systematic assessment of the health effects of air pollution in Yugoslavia. In general, the present levels of industrial plus vehicular air pollution are in concentrations that a number of studies have associated with effects on mortality (cardiovascular, respiratory, total) and hospital emergency admissions.

Table 15.5: Detected infectious diseases in out-patient services in 1999 by region

	Yugoslavia	Montenegro	Serbia			
			All Serbia	Central Serbia	Vojvodina	Kosovo
Pulmonary tuberculosis (A15-A16)	1,694	162	1,532	992	312	228
Typhus abdominalis (A01)	17	0	17	11	6	0
Gastroenteritis (A09)	13,319	5,525	7,794	5,963	1,578	253
Hepatitis B (B16)	202	9	193	134	41	18
Poliomyelitis (A80)	5	0	5	5	0	0
HIV (B20-B24)	45	0	45	40	5	0

Source: Federal Statistical Office of Yugoslavia. Statistical Yearbook of Yugoslavia. Belgrade, 2001.

Table 15.6: Leading causes of mortality in Yugoslavia in 1999

	Absolute number of deaths	Percentage of all deaths per year
Pulmonary heart diseases (126-128)	27,473	25.7
Apoplexies (160-169)	17,406	16.3
Ischaemic heart disease (120-125)	11,650	10.9
Symptoms and ill-defined conditions (R00-R99)	8,529	7.6
Malignant neoplasms of the digestive tract (C15-C26)	5,492	5.1
Injuries (S00-T14)	4,845	4.5
Malignant neoplasms of the respiratory tract (C30-C39)	4,463	4.2
Obstructive lung disease (J40-J47)	4,436	4.0
Chronic digestive tract diseases (K20-K87)	3,008	2.8
Diseases caused by hypertension (I10-I15)	1,363	1.3
Total	88,665	82.4

Source: Federal Republic of Yugoslavia. Federal Institute of Public Health. Health Statistical Yearbook 1999 CD-Rom. 2002.

Outdoor air pollution in Serbia

Criteria for establishing air pollution measuring points in Serbia were developed using WHO guidelines and expert assessment. The criteria for site selection were population density, demographic and health data, the characterization of the built environment, land-use data, meteorology and topography. The criteria for the selection of monitored air pollutants were ubiquity and impact on human health. The number and site choice of the measurement points in towns and industrial towns are a "representative minimum, limited by finances" (see also chapter 3, on information, public participation and awareness-raising).

Sulphur dioxide (SO_2) pollution is mainly due to industrial emissions, power plants and heating combustion. As a result of heating combustion, SO_2 concentration is higher in winter. In Serbia, the annual average of SO_2 exceeds the WHO annual air quality guideline limits in Bor, Ivanjica, Leskovac, Vranje, Kikinda and Kragujevac. Serbia's maximum allowable concentration (MAC) of SO_2 is exceeded at single measuring points on 188 days in Bor, 63 days in Vranje and 22 days in Kikinda, and, to a lesser extent, in Leskovac, Šabac, Novi Sad, Kragujevac, Smederevo and Užice. The reported ranges of SO_2 concentration in the air in Serbia make it a health hazard for the population living in towns near industries and power plants based on coal combustion, especially in the winter (see also chapter 6, on air management).

As demonstrated in international epidemiological studies, the negative health impacts of high short-term exposure to SO_2 can be changes in pulmonary function in exercising asthmatics and respiratory symptoms. The negative health impacts of periods with high long-term exposure to SO_2 can be increased mortality and morbidity or changes in lung function.

Nitrogen dioxide (NO_2) pollution is mainly due to industrial and traffic emissions. In Serbia, the annual NO_2 average does not exceed the WHO

annual air quality guideline limits. The MAC of NO_2 is exceeded at single measuring points on 10 days in Kruševac, 7 days in Belgrade and 5 days in Pančevo. The negative health impacts of high exposure to NO_2 can be increases in bronchial reactivity in healthy and asthmatic subjects. Increased respiratory symptoms in children have been associated with long-term ambient NO_2 exposure (including indoor exposure to emissions from domestic gas cookers and boilers). NO_2 is a chemical involved in the photo-chemical reactions that lead to the formation of ozone, which is a known health hazard, mainly for asthmatics and children. Ozone levels in Serbia are not reported.

Soot is mainly elementary carbon, formed during incomplete combustion processes with additional chemicals in particulate matter. The main sources of the formation of soot are abrasion from car tyres, diesel soot particles, flue ash and burning materials. Soot is frequently measured as an indicator of air quality in Serbia. Diesel particles, particle matters and PAHs are measured neither routinely nor frequently.

WHO does not give guideline values for soot and particulate matter, on the grounds that no threshold has been identified below which no adverse health effects are likely to occur. The German Ministry of Environment, in its "Federal Imission Control Act" (23rd BImSchV), gives an annual concentration of 10 $\mu g/m^3$ as a threshold value for soot. However, it is difficult to compare measurements of soot with those of other air quality indicators for particulate matter which are commonly used in other countries, since soot monitoring is carried out without a standardized reference system, and no conversion factors from soot to, for instance, PM10 or PM2.5 are readily available. For reference, European Directive 1999/30/EC requires an annual concentration of PM10 of maximum 40 $\mu g/m^3$ by 1 January 2005 and 20 $\mu g/m^3$ by 1 January 2010. However, there is currently no measurement of either PM10 or PM2.5 in Yugoslavia.

The 2005 EU targets for annual threshold value are exceeded in Belgrade by 95.6 $\mu g/m^3$, and the 2010 targets are exceeded in Novi Sad, by 24.1 $\mu g/m^3$ and in Nis, by 16.6 $\mu g/m^3$. The MAC for soot is exceeded at single measuring points on 281 days in Užice, 170 days in Smederevo, 141 days in Belgrade, 141 days in Šabac, 118 days in Leskovac and to a lesser extent in Niš, Čačak, Zrenjanin, Vranje and others.

There is increasing evidence that tiny dust particles, measured in microns or even nanometres, have adverse effects on human health. They have been correlated to premature deaths and a reduced quality of life by aggravating respiratory conditions such as asthma. Although no suitable information on concentrations of particulate matter and exposure was available to allow a quantitative assessment of the possible health effects, soot concentration in the air in Serbia falls within a range that can pose a health hazard for the population in towns with high traffic emission, air polluting industries, and coal-burning power plants and heating.

Total deposited matter (TDM) is another parameter for outdoor air quality. Its MAC is exceeded at single measuring points on eight days in Niš, seven days in Čačak and to a lesser extent in other towns.

Heavy metals such as lead, cadmium, mercury and arsenic are regional health hazards in Yugoslavia. Heavy metals have increased in Bor and at some points in Belgrade and in the vicinity of medium and small private companies with inadequate equipment. The sources of heavy metal pollution are inadequate industrial processes, mainly mining and the mining industry, power plants and heavy industry.

In Yugoslavia lead is still used as an additive in petrol. Lead is harmful for humans, particularly for the development of cognitive functions in children (see also chapter 13, on transport and the environment).

As many industries have closed down and others do not work to full capacity, air pollution from stationary sources has decreased over the past few years. However, as normal industrial activities resume, there is the risk that emissions could rise again if the reduction and control of emissions are not adequately addressed (see also chapter 10, on industry and the environment), At the same time, the expected increase in emissions from traffic will represent a growing challenge, as mobile sources of pollution increase more than stationary sources.

Outdoor air pollution in Montenegro

The aluminium company in Podgorica is Montenegro's biggest single polluter. There is no proper filtering in the processing of bauxite to aluminium. High levels of fine dust particles,

solvents and fluorides are the result of missing or defective air filters. The soil is polluted with PCBs. The groundwater is polluted with PCBs and fluorides (see also chapter 10, on industry and environment).

The coal power plant in Pljevlja does not use filters, so that TSP causes severe air pollution during the winter heating season. Similar problems with air quality exist near all central heating plants and thermoelectric plants.

The ironworks in Nikšić operates without any filters. Due to the particular geographic situation of Nikšić, TSP pollution, and especially lead pollution, is high. Coal (Pljevlja, Berane) and red bauxite (Nikšić) mining causes waste and groundwater problems.

There is no systematic data collection on air quality and consequently no data on air quality figure in the 2000 official statistic yearbook on population and public health in Montenegro. The National Institute of Public Health in Podgorica did report that, for 1997, air quality parameters in Podgorica were good.

Indoor air pollution

The most obvious indoor pollutant is tobacco smoke. Active smoking and passive smoking are well known major public health hazards. Cigarettes are cheap, easily available and of low quality. The 47% smoking rate at the age of 15 or older (52% of males and 42% of females) in Yugoslavia is very high and compares unfavourably to the EU rate of 29% and the rate for all of Central and Eastern Europe (39%).

The extremely high incidence of smoking is one of Yugoslavia's worst health hazards. In Central and Eastern Europe, the rate at which men who are currently 35 years old will die from smoking before the age of 70 is estimated to be twice as high as in Western Europe, with an average loss of approximately 21 years of life. Men in Central and Eastern Europe have the highest death rates due to tobacco use worldwide and the highest lung cancer rates worldwide. In Serbia it was estimated that smoking causes 30% of deaths. Indoor pollution in the home is assessed only occasionally.

Asbestos is another known carcinogenic indoor pollutant. But there are no systematic data on how much asbestos has been used in buildings. The risk of lung cancer from asbestos increases in accordance with the exposure time and quantity.

Many hazardous chemicals, such as solvents, insecticides or other household chemicals, are used indoors but there are no data on their health impact.

Drinking water, waste water and health

Drinking water quality is of major importance for public health. The "Report on Drinking Water Hygiene in the Federal Republic of Yugoslavia" for 1999 listed 183 central water-supply systems (164 in Serbia, 19 in Montenegro). More than 5% of the samples analysed were microbiologically contaminated, mainly with E. coli and Enterobacter bacteria. On the basis of the sources of the infected samples, it was concluded that 46.7% of the controlled central water-supply systems (43.9% of those in Serbia and 73.6% of those in Montenegro) were unsafe owing to microbiological contamination.

In addition, 39.3% of the controlled central water-supply systems (37.8% of those in Serbia and 52.6% of those in Montenegro) did not meet the standards set for physico-chemical analysis. In general, the problems were the absence of residual chlorine and too high a concentration of nitrites, nitrates and organic matter.

Overall, according to the National Institute of Public Health in Belgrade, the increase in microbiological irregularity in the waterworks between 1981 and 1996 was slight – about 5% – although with a large variation from one year to the next. However, the increase in physico-chemical irregularity was much greater – more than 30%.

Many people used unsafe water supplies in the year 2000. In central Serbia and Vojvodina, 83.3% of the population used in-house tap water; 6.8% used water from protected wells; 5.1% used water pumped from unprotected wells; 2.8% used local waterworks on private property; and 1.5% drew water from other sources.

In 1995, 98% of the urban population in Serbia was reported to have access to safe drinking water, with little regional variation. However, only 63.3% of the rural population had good-quality drinking water. Regional differences in rural areas were significant, and the percentage of rural population with access to safe water was as follows: 86.8% in Vojvodina, 59.2% in central Serbia, and 32% in

Kosovo and Metohija. There have been no major epidemic outbreaks of infectious diseases in Serbia as a result of poor-quality drinking water. Microbiological testing of water in Montenegro showed that, in 2000, 13.0% of 394 samples analysed were microbiologically contaminated, and 15.3% of 464 samples did not meet physico-chemical parameters. (In Yugoslavia's statistical yearbook, the term "microbiologically unsafe" is defined as "large number of germs in 1 ml of water".)

In 2000, samples in Ulcinj (47.6%), Tivat (31.8%), Andrijevica (22.9%) and Bar (21.2%) were more microbiologically contaminated than in other places, such as Berane, Danilovgrad and Podgorica (all below 3%). In the summer, water-supply capacity is lower, causing a higher risk of secondary water contamination. Insufficient waste-water systems and leaking dumpsites pollute the groundwater and surface water systems. Damage to water-supply systems and insufficient chlorination are the main reasons for the inadequate water safety in Montenegro.

The improper disposal of sewage, too, can be a cause of drinking water contamination. Data for central Serbia and Vojvodina for the year 2000 show that only 57.2% of the population has access to a sewerage system; 31.1 % used septic tanks; 10.5% had to use outdoor sanitary facilities, and 1.2 %, other means of disposal.

Only about 14% of municipal waste water is treated in a waste-water plant. Even less waste water is treated from the main water polluters – the mining and manufacturing industries.

Waste management

Waste management in Yugoslavia is insufficient (see chapter 7, on waste management). Leaking waste dumps may pollute drinking water. Occupational risks may be linked to the operation of some disposal facilities. Inadequate incineration or the incineration of unsuitable materials can release pollutants into the air. Opencast mining tailings and other waste from the mining industry are inadequately treated. The dumpsites of coal power stations pollute the surrounding environment. The possible health hazards of waste management have not been assessed. The risk to human health cannot be estimated.

Food, nutrition and the health impacts of contaminated food

Energy intake per person in 1986 was 2,695 kcal/day, rising to 3,160 kcal/day in 1991, but then dropping to 2,434 kcal/day in 1993. In 1999 the Yugoslav average was 2,805 kcal/day, compared to the Central and East European average of 3,267 kcal/day and the EU average of 3,460 kcal/day. In Yugoslavia, 11.6% of total energy available was a protein source (Central and East European average was 11.9% and EU average 12.2%). The nutritional status of women and children in Serbia declined between 1986 and 2000. In 2001 Serbia's Ministry of Health and Social Affairs considered poverty to be the cause of this deterioration.

Data on food and consumer goods safety are collected by Serbia's and Montenegro's Institutes of Public Health. According to 1998 data, 9.4% of the total number of food samples analysed and 23.1% of food samples from open markets did not meet the required standards. The reported number of salmonella cases was 48 per 100,000 population in Yugoslavia. This figure is low compared, for example, to the Central and East European average of 109 and the EU average of 52, but the difference might be due to under-reporting in Yugoslavia and to a lower use of laboratory tests to confirm the diagnosis than in wealthier health care systems.

Microbiological testing of the quality of foods and consumer goods in Montenegro showed that, in 1996, 18.9% of the 2,662 samples analysed were microbiologically contaminated, falling, in 2000, to 9.17% of 5,854 samples. Contamination was particularly a problem with locally produced milk and other dairy products. Tests of foods and consumer goods for physical and chemical properties showed that, in 1996, 23.2% of 1,732 samples did not meet safety requirements. In 2000, however, this had dropped to 3.54% of 5,111 samples.

There is a lack of information on breast milk contamination with polychlorinated biphenyls (PCB), dichlorodiphenyltrichloroethane (DDT) and its metabolite dichlorophenyldichloroethylene (DDE), dioxins, lead and mercury. There are no data available on the contamination of food in general with DDT, DDE, PCB, dioxins or other persistent chemicals.

The agricultural use of pesticides is low; it declined from 3 kg/ha of cultivated land in 1985 to less than 1 kg/ha in 1993-1997. Pesticides residues are reported to be low in soil and water.

Hospital and medical waste

There is no systematic data collection on the volume of medical or hospital waste in Yugoslavia. For Belgrade alone, the Belgrade Institute of Public Health estimates at 3,000 tons the volume of infectious waste for all health care facilities and research institutions for the year 2001. Serbia estimates that 9,600 tons of biohazardous waste is generated annually, about half of which is from hospitals. No data are available for Montenegro. (See also chapter 7, on waste management.)

Only the collection, transport and final disposal of body parts and tissues, as well as of radioactive waste, are regulated. Infectious waste is treated as ordinary municipal waste. In most health care facilities the different kinds of medical waste, such as used syringes and needles, dressings, intravenous lines or cotton balls, are not separated.

Hazardous medical waste is stored in containers together with other waste from health care institutions. People scavenge these containers for used paper and other raw materials. These people risk both infection and injury from sharp objects. There is no training for people in contact with infectious waste.

Occupational health and risks near industrial areas

In Yugoslavia, most recent figures show a reported 214.6 work-related accidents per year per 100,000 population, compared to the Central and East European average of 398 and the EU average of 1,308. However, the numbers do not reflect the real risk. Many industrial facilities are not working, and under-reporting is likely, since the occupational health units are poorly staffed.

In Serbia, PCBs continue to be released from both damaged and poorly maintained industrial facilities (e.g. in Bor and Kragujevac). The contamination of the soil, water and local food with PCBs, and equipment that was destroyed during the bombing but is still leaking, pose a special risk for the workers nearby. Even more toxic dioxins and furans are released along with PCBs, but these are more difficult to detect with the laboratory methods available in the country. PCBs are neurotoxic substances and a human health hazard. Through bioaccumulation, it is mostly breastfed infants why are exposed. PCBs are also a particular threat to the pre- and postnatal development of children.

In Montenegro, the aluminium plant in Podgorica is the main occupational health hazard. Due to unhealthy working conditions, up to 70% of the workers suffer from asthma or chronic bronchitis, possibly due to the high levels of fine dust in the working complex. No personal protection equipment is used, and the inadequate technical safety infrastructure results in a high incidence of workplace accidents. Workers in the aluminium plant are exposed to high levels of fluorine in the air. Fluoride stored in the bones can cause fluorosis, with major malformation of the whole skeletal system. The Clinical Centre of Serbia's Institute for Occupational Medicine has examined workers from Podgorica, and found 20 confirmed cases of fluorosis between 1996 and 2000. The danger of contracting the disease increases with the length and intensity of exposure.

Occupational health hazards exist in other industries in Serbia and Montenegro, but the equipment of the occupational health units is not always sufficient to diagnose and treat them. Occupational health units have to be strengthened and enabled to introduce more preventive measures.

Traffic-related health effects

Cars are fairly old in Yugoslavia, many of them more than 10 or 15 years old. Vehicle emissions of soot, NO_2, and CO_2 are main sources of outdoor air pollution. The refineries in Novi Sad and Pančevo were poorly reconstructed after the bombing in 1999 and produce poor-quality fuel (see also chapter 13, on transport and the environment).

Environment and health effects in hot spots

The UNEP/United Nations Centre for Human Settlements Balkans Task Force identified environmental hot spots in four areas: Pančevo, Kragujevac, Novi Sad and Bor (see also chapter 4, on international cooperation and chapter 10, on industry and the environment). Among the more problematic pollutants identified were:

- In Pančevo, 1.2-dichloroethane (EDC) in water and sediments and mercury contamination of the ground;
- In Kragujevac, dioxin and PCB contamination of the ground;

- In Novi Sad, volatile hydrocarbons, PAHs, PCBs and mercury in water and sediments; and
- In Bor, large amounts of SO_2 released into the air; PCBs and heavy metals in the soil.

PCBs, dioxin, PAHs, mercury and SO_2 pose significant hazards to human health. The extent of the hazard depends on the length, exposure pathway and dose of exposure. No systematic research, apart from occasional case reports, into possible harm to health from these pollutants in the hot spots has been undertaken.

There is still some mercury in the soil in Pančevo, contaminating the groundwater and the nearby Danube. Mercury uptake by drinking water, such as from local groundwater wells, could increase the body burden of mercury on humans. A study in 2001 evaluated this possibility. Human urine was taken as a bio-marker for the exposed population. The mercury concentration in the population was higher in the village of Ivanovo than elsewhere in the area. Chronic mercury intoxication could damage the nervous system of a moderately exposed, sensitive population.

There has also been concern about the possible health effects of depleted uranium. According to the conclusions of a UNEP and WHO report, based on a review of currently available scientific data and on a mission to Kosovo and Metohija, "Soldiers, particularly those at the site of an attack, are the most likely to have inhaled uranium metal and oxides in dusts and smoke. It is likely that the general population would not have encountered this form of transmission pathway or, at the very worst, only in very isolated instances." The report also concluded that "There is no convincing evidence to indicate any health impacts to the Kosovo population associated with depleted uranium", and it pointed out that the health and population information systems available in Kosovo and Metohija at present do not permit reliable identification of any changes in disease frequency in the population.

Where bombing damaged or destroyed industrial sites, environmental pollution was added to pre-existing environmental pollution, mainly in those areas which were already highly polluted due to the presence of industrial activities. The extent of the damage to health from increased exposure to environmental hazards as a result of the armed conflict has not been assessed and so is unknown.

15.3 Environmental health policy and management

Policy objectives and management

The policy framework

During the Second Ministerial Conference on Environment and Health in Europe, in Helsinki in June 1994, the participating Ministries of Environment and Health agreed to establish national environmental health action plans (NEHAPs) in their countries. Many Governments in Europe have already completed this task. However, there are not yet any plans to develop a NEHAP in Yugoslavia.

The legislative framework

Yugoslavia's Constitution entitles everyone to a healthy environment (art. 52). The Law on Records in the Scope of Public Health regulates the responsibility of the Federal Institute of Public Health to monitor public health data. Federal legislation specific to water and health includes the Law on Health Protection, the Law on Health Safety of Food and Common Use Objects, the Law on Health Protection of the Population from Communicable Disease, the Law on the Water Regime and Guidelines for Drinking Water Quality.

Other relevant legislation in the constituent republics is found in laws on water, air and waste (see chapters 5, 6 and 7, respectively on management of water resources, air management and waste management).

Serbia's air quality standards according to the "Regulations on Imission Limit Values" are shown in table 15.7. The WHO limits for SO_2 are the same as Serbia's for the annual concentration (50 $\mu g/m^3$), but lower than Serbia's for the 24-hour concentration (125 $\mu g/m^3$ versus 150 $\mu g/m^3$). The WHO limits for NO_2 are lower than Serbia's for the annual concentration (40 $\mu g/m^3$ versus 60 $\mu g/m^3$).

The regulation on drinking water quality is harmonized with WHO recommendations and EU standards.

Table 15.7: Air pollution

	Unit	Average time	WHO air quality guidelines	Serbian air quality standards
			Time-weighted average	
SO_2	µg/m^3	10 minutes	500	-
		30 minutes	-	500
		24 hours	125	150
		annual	50	50
NO_2	µg/m^3	30 minutes	-	150
		1 hour	200	
		24 hours	-	85
		annual	40	60
Ozone	µg/m^3	8 hours	120	120
TDM	µg/m^3	annual		
Soot	µg/m^3	annual		
Soot	µg/m^3	24 hours		50

Source: Republic of Serbia, Ministry of Health an Environmental Protection. Snežana Matić-Besarabić, Slavko Kostoski: Air Pollution in the Republic of Serbia 2000. Belgrade, 2001.

Note: - = no measurements.

The institutional framework

The Federal Secretariat for Labour, Health and Social Care is responsible for health and environmental issues in Yugoslavia. The Ministry coordinates the activities of the federal institutes, including the Federal Institute of Public Health (collection and reporting of public health data and information) and the Hydrometeorological Institutes (monitoring of air, water and radioactivity).

In Serbia, with the creation of a new Ministry for Protection of Natural Resources and Environment, there is also a separate new Ministry of Health. In Montenegro, the Ministry of Health and Social Policy is the primary institution for health-related matters, along with the Institute of Public Health, the Republic Hydrometeorological Institute and the Centre for Ecotoxicological Research.

There is no special department for environmental health at federal level or in Serbia or Montenegro. Such a department could analyse data and the existing legal framework from a cross-sectoral perspective and help to coordinate environmental and health activities.

The health care system

Health care services are the responsibility of the governments of Serbia and Montenegro. Their health insurance funds are separate. The Federal Secretariat of Labour, Health and Social Policy is responsible for relations with international agencies, drug registration, surveillance and control of some infectious diseases (e.g. tuberculosis).

In the year 2000, Yugoslavia had 213 physicians per 100,000 population, compared to the Central and East European average of 249 and the EU average of 387. In 1999, there were 540 hospital beds per 100,000 people (Central and East European average, 679; EU average, 595). Total health expenditure was 7.6% of GDP, which compares favourably to the Central and East European average of 5.8% (EU average, 8.5%).

However, there has been a drastic decrease in per capita spending by the public sector in Serbia. Between 1989 and 2000, health expenditures fell from US$ 240 to US$ 46. Among the negative consequences have been increased “under-the–table” payments and a deterioration of the existing infrastructure.

15.4 Conclusions and recommendations

Environmental health issues should become a higher priority at all government levels. Existing laws, regulations and standards should be better integrated and enforced and revised according to the World Health Organization’s guidelines and other international standards and practices, such as those of the European Union. Greater horizontal coordination and harmonization among the relevant

ministries and institutions is needed, as is vertical coordination between the Federal Government and the republics and between the republics and the municipalities. Comprehensive environment and health action plans are essential.

Recommendations to the Federal Government, Serbia and Montenegro

Recommendation 15.1:
*The **Federal Secretariat** for Labour, Health and Social Care, **Serbia**'s Ministry of Health, in cooperation with its Ministry for Protection of Natural Resources and Environment, and **Montenegro**'s Ministry of Health and Social Policy, in cooperation with its Ministry of Environmental Protection and Physical Planning, should:*

(a) *Together draw up a national environmental health action plan (NEHAP) to identify priorities and establish an implementation plan, paying particular attention to resource requirements. Among other issues, the NEHAPs should address activities for awareness-raising, and define a strategy to improve waste-water treatment, waste disposal, air quality, drinking water, food safety and traffic safety;*

(b) *Consider the establishment of an intersectoral body for environmental health that would, inter alia, aggregate, analyse and interpret the relationship between existing environmental and health data; review existing laws, conventions and regulations for environment and health, with particular reference to World Health Organization (WHO) guidelines and European Union regulations; and coordinate environment and health activities with a view to building strong environmental health networks at all levels;*

(c) *Help municipalities to develop local environmental health action plans with strong public participation; and*

(d) *Give consideration to the UNECE-WHO Transport, Health and Environment Pan-European Programme (THE PEP) as a policy tool around which specific actions and partnership (including at the international level) to tackle the environmental and health problems posed by transport could be developed.*

Although some health statistics are available, such as number of diseases or deaths by cause, calculating correct morbidity or mortality rates requires knowledge about the actual population structure. Since the previous census was carried out more than ten years ago and considerable population fluctuations have taken place since then, current estimates of population and health statistics are likely to be incorrect and are not fully comparable regionally or internationally.

There are currently no combined data for health and environment and therefore no solid basis to evaluate the real extent of the environmental burden on health in Serbia and Montenegro. This is a particularly critical problem for some of the regions where industrial and mining pollution, power plants and dumpsites are clear threats to human health.

Recommendation 15.2:
(a) *The appropriate statistical office(s) should carry out a census as soon as feasible;*

(b) *The statistical offices and public health institutes at all levels should cooperate to identify a common set of essential environmental health indicators that need to be monitored and reported on a regular basis and decide among themselves on which institutions should be responsible for collecting these data. These data should be collected systematically and made available to the public. Ongoing international developments could provide a most useful reference for this work, also in view of improving international comparability of data;*

(c) *The public health institutes at all levels should address the need to undertake combined exposure assessments and analyses of health and environmental data in order to identify the negative health effects of environmental pollution. This should include reviewing the existing data collection and standardized protocols for data collection and evaluation, in close cooperation with statistical offices. Missing data should be identified and recommendations on reorganizing data collection should be given. The result of the analysis should be routinely reported; and*

(d) ***Serbia**'s Ministry of Health, in cooperation with its Ministry for Protection of Natural Resources and Environment, and*

***Montenegro**'s Ministry of Health and Social Policy, in cooperation with its Ministry of Environmental Protection and Physical Planning, should initiate scientific investigations into the impact of specific local environmental pollution on health and address public concerns in relation to these issues.*

Outdoor air pollution is a health hazard in certain areas of the country. Sulphur dioxide concentrations near industrial areas and power plants, and in towns during winter, breach WHO air quality guideline values. A parameter for fine particle matters, soot, also breaches air quality guideline values. High soot is due to combustion processes in industry and elsewhere. Specific air pollutants (lead, fluorides) are endangering the health of the population near some big industrial complexes. These are all serious problems and are addressed in chapters 6, on air management; 8, on mineral resources management; 10, on industry and environment; and 11, on energy and environment. However, another highly significant health hazard is smoking, including the dangers posed by passive smoking and indoor air pollution.

Recommendation 15.3:
*The **Federal Secretariat** for Labour, Health and Social Care, **Serbia**'s Ministry of Health and **Montenegro**'s Ministry of Health and Social Policy should:*

(a) *Carry out continuous and major public awareness campaigns to reduce smoking among the population. Particular efforts should be made to prevent young people from taking up the habit. Initiatives such as "The National Committee for Tobacco Prevention", "Quit and Win" or "Clear the air from cigarette smoke" have to be strengthened financially; and*

(b) *Work together to develop and pass anti-smoking legislation to protect children and other non-smokers from passive smoking. Existing regulations have to be enforced. No-smoking policies in public and private buildings should be initiated.*

In Yugoslavia drinking water is of varying quality. Some of the public drinking water-supply systems are deteriorated to the point that they pose a health hazard to their consumers. Microbiological and physico-chemical contamination of drinking water is rampant in some areas. People with local, uncontrolled water-supply systems or private wells are especially at risk.

The pollution of ground and surface water from inappropriate waste-water treatment and leaking dumpsites has to be drastically reduced. Waste-water treatment facilities need to be built or upgraded, mainly in urban areas and for industrial sites. Sanitary landfills for urban areas need to be built or rehabilitated. Damage to the water-supply system needs to be repaired, and proper chlorination guaranteed (see recommendations contained in chapters 5 on management of water resources and 7 on waste management).

Recommendation 15.4:
*The **Federal Secretariat** for Labour, Health and Social Care, **Serbia**'s Ministry of Health, in cooperation with its Ministry for Protection of Natural Resources and Environment, and **Montenegro**'s Ministry of Health and Social Policy, in cooperation with its Ministry of Environmental Protection and Physical Planning, should:*

(a) *Adopt and implement the WHO Guidelines for drinking-water quality in order to improve the microbiological and physico-chemical safety of drinking water; and*

(b) *Strengthen the legal and institutional framework for monitoring and enforcing drinking-water quality standards in accordance with the UNECE Helsinki Convention on the Protection and Use of Transboundary Watercourses and International Lakes (see Recommendation 4.2).*

The disposal of medical waste has been completely neglected up to now. Biohazardous waste from hospitals and other health facilities is disposed of along with other waste without any separation or special treatment. This is a significant health hazard.

Recommendation 15.5:
*(a) **Serbia**'s Ministry for Protection of Natural Resources and Environment and **Montenegro**'s Ministry of Environmental Protection and Physical Planning should regulate and implement the proper management of medical waste. This should include, inter alia:*

- *Developing separate collection strategies for wastes with different levels of hazardousness;*
- *Providing incinerations, disinfection and special treatment for infectious medical waste; and*

- *Exploring ways to reuse and recycle materials to reduce the amount of hazardous waste.*

These activities could begin as pilot projects, implemented in cooperation with local authorities, hospitals and other stakeholders.

(b) ***Serbia**'s Ministry of Health and **Montenegro**'s Ministry of Health and Social Policy should, through their public health institutes, train medical professionals and others who have contact with medical waste.*

In the hot spots, a number of persistent pollutants continue to expose the workers and the population within the areas to significant health risks. The extent of the health effects of PCBs, dioxin, PAHs, mercury and sulphur dioxide, however, has not been assessed.

Recommendation 15.6:

*The **Federal Secretariat** for Labour, Health and Social Care, **Serbia**'s Ministry for Protection of Natural Resources and Environment, in cooperation with its Ministry of Health, and **Montenegro**'s Ministry of Environmental Protection and Physical Planning, in cooperation with its Ministry of Health and Social Policy, should:*

(a) *Supervise the medical check-ups of the population at risk in the hot spots, e.g. nursing mothers, to assess the possible health effects on industrial pollutants and the extent of the body burden of the pollutants. The data of human bio-monitoring and health effects should be combined with environmental monitoring data. Such knowledge helps to decide which environmental clean-up actions are most urgent;*

(b) *Initiate, during clean-up actions, human bio-monitoring and effect monitoring to measure the effectiveness of the actions; and*

(c) *Initiate epidemiological environmental research programmes in cooperation with international organizations, regional health authorities and research institutes.*

KOSOVO

Introduction

On 10 June 1999, the Security Council of the United Nations adopted resolution 1244 authorizing the United Nations Interim Administration Mission in Kosovo (UNMIK) to, inter alia, "provide an interim administration for Kosovo under which the people of Kosovo can enjoy substantial autonomy within the Federal Republic of Yugoslavia, and which will provide transitional administration while establishing and overseeing the development of provisional democratic self-governing institutions to ensure conditions for a peaceful and normal life for all inhabitants of Kosovo."

In addition, in its resolution 1244, the Security Council called upon UNMIK to:

- Perform basic civilian administrative functions;
- Facilitate a political process to determine Kosovo's future status;
- Coordinate humanitarian and disaster relief of all international agencies;
- Support the reconstruction of key infrastructure;
- Maintain civil law and order;
- Promote human rights; and
- Assure the safe and unimpeded return of all refugees and displaced persons to their homes in Kosovo.

In order to implement the resolution, four "pillars", led by international organizations, were established, as follows:

- Pillar I: Humanitarian assistance led by the Office of the High Commissioner for Refugees (UNHCR);
- Pillar II: Civil administration led by the United Nations;
- Pillar III: Democratization and institution building, led by the Organization for Security and Co-operation in Europe (OSCE); and
- Pillar IV: Reconstruction and economic development, led by the European Union (EU).

The first pillar was phased out in June 2000 and a new pillar, for police and justice, was established and is led by the United Nations.

Prior to 1990, Kosovo's economy had been based primarily on the mining industry, the production of lead, zinc and textiles, and agriculture. Environmental issues, however, were largely ignored, and environmental problems were further exacerbated by the conflict. This situation is now changing, and the Kosovo authorities have identified a number of environmental priorities to be addressed in the near and medium term. These include:

- The sustainable use of natural resources;
- Reducing air pollution from both mobile and stationary sources;
- Introducing a waste-water treatment system (sewage and industrial water);
- Improving water supply;
- Improving the management system for municipal, commercial and industrial waste;
- Prohibiting the illegal disposal of all types of waste;
- Introducing cleaner technologies and environmentally friendly products;
- Recycling secondary raw material selected from waste, including paper, glass, aluminium and ferrous materials, construction and demolition waste;
- Enforcing environmental impact assessments (EIA) for all large development projects, landfills, producers and users of hazardous waste, and industrial processes;
- Rehabilitating the energy sector;
- Assisting institutions monitoring pollution in water, air, soil and food;
- Improving the collection, processing and dissemination of environmental information; and
- Increasing public awareness of environmental concerns.

INSTITUTIONAL ARRANGEMENTS

Introduction

UNMIK is headed by the Special Representative of the Secretary-General and is assisted by four deputy special representatives. Under the civil administration pillar, UNMIK initially set up a regional structure with 5 regional administrators and 30 municipal administrators. It also established 20 central departments, including an environmental department in May 2000. The departments were co-directed by a local representative, nominated by a political party, and by a senior UNMIK international staff member.

In October 2000 the first step towards substantial self-government was taken with the election of local governments. This was followed a year later by Kosovo-wide elections for the "provisional institutions of self-government". The foundations for such institutions are laid down in the constitutional framework for self-government, which was passed in May 2001. The constitutional framework outlines the division of powers between the Special Representative of the Secretary-General (the reserved powers) and the provisional institutions of self-government (the transferred powers). It determines the size, shape, powers and responsibilities of the government with a prime minister and ministers. In addition, it sets out how provisional self-government will operate with an elected assembly, a president, an assembly presidency, assembly committees, an independent judiciary and independent offices.

Since the elections, UNMIK has begun to reduce the number of its staff from the day-to-day administration and increase the number of local staff. The role of UNMIK is also changing from decision-making to a more supervisory and advisory role. However, UNMIK holds final responsibility for any failure or mismanagement in the provisional institutions for self-government.

By June 2002, ten ministries had been established. The following are of direct relevance to the environment:

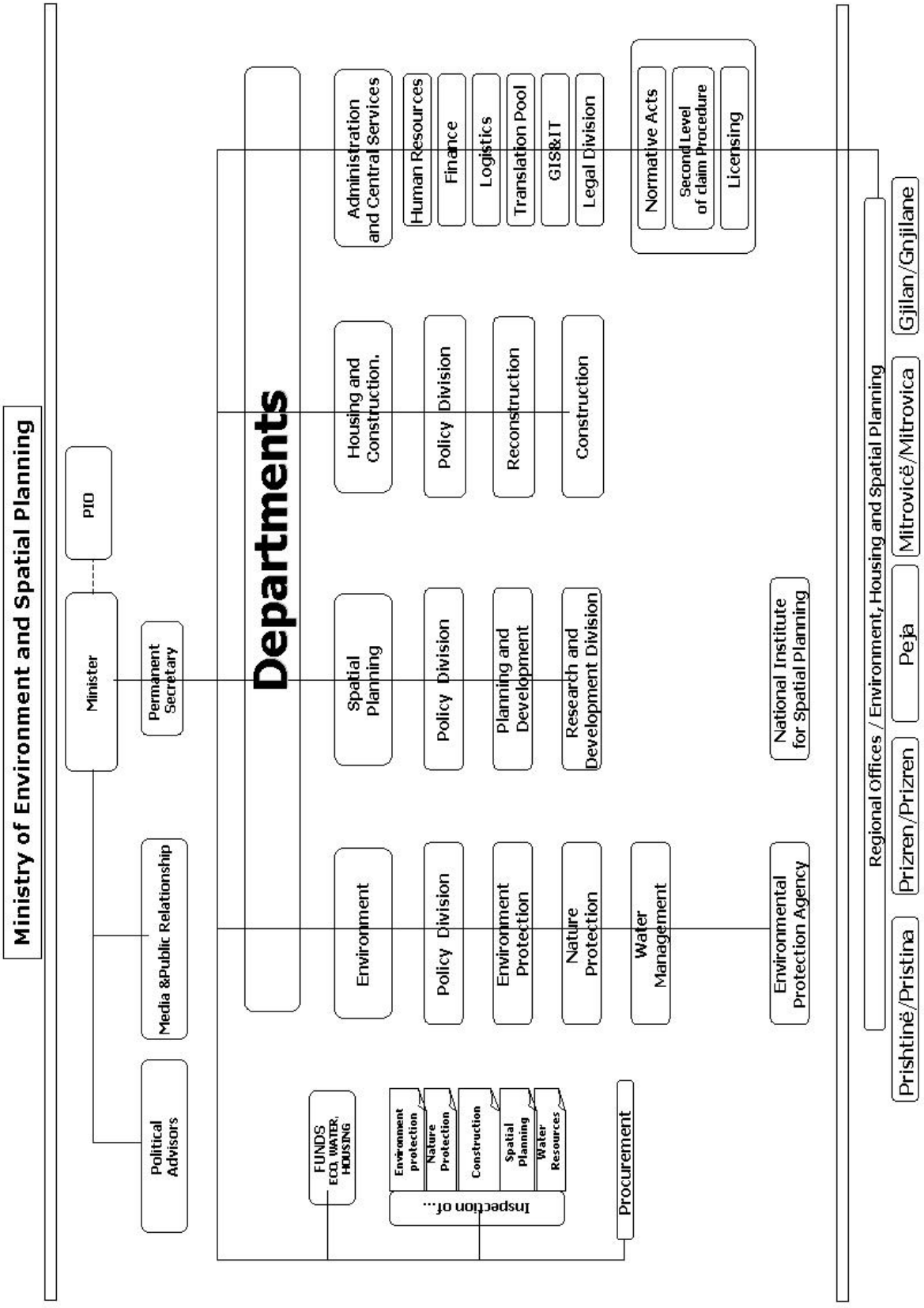
- The Ministry of Environment and Spatial Planning
- The Ministry of Trade
- The Ministry of Health
- The Ministry of Transport and Communication, and
- The Ministry of Agriculture, Forestry and Rural Development

Ministry of Environment and Spatial Planning

In May 2000, UNMIK issued a regulation on the establishment of the administrative department of environment protection as part of the Kosovo joint interim administrative structure. The regulation set out the functions and responsibilities of the department. These competences regarding environmental protection include water resources, air, soil and biodiversity. The environment department consisted of five international and nine local staff. In addition, there were five international regional coordinators. The budget for 2000 was DM 300,000 (approximately US$ 150,000).

In September 2001, the regulation on establishing the executive branch of the provisional institutions of self-government was issued. This regulation forms the basis for establishing a total of nine ministries, including the Ministry of Health, Environment and Spatial Planning. However**,** in March 2002 this Ministry was split into two: the Ministry of Health and the Ministry of Environment and Spatial Planning. The environmental responsibilities of the new Ministry of Environment and Spatial Planning include:

- Setting norms and standards, and ensuring compliance;
- Awareness raising;
- Environmental education;
- Transferring clean technologies;
- Monitoring and assessment;
- Coordinating environmental protection activities;
- Developing policy and legislation; and
- Establishing protected areas.


Ministry of Environment and Spatial Planning
Minister
PID
Permanent Secretary
Media &Public Relationship
Political Advisors
Departments
Environment
Policy Division
Environment Protection
Nature Protection
Water Management
Spatial Planning
Policy Division
Planning and Development
Research and Development Division
National Institute for Spatial Planning
Housing and Construction.
Policy Division
Reconstruction
Construction
Administration and Central Services
Human Resources
Finance
Logistics
Translation Pool
GIS&IT
Legal Division
Normative Acts
Second Level of claim Procedure
Licensing
Environmental Protection Agency
Regional Offices / Environment, Housing and Spatial Planning
Prishtinë/Pristina
Prizren/Prizren
Peja
Mitrovicë/Mitrovica
Gjilan/Gnjilane
FUNDS ECO, WATER, HOUSING
Inspection of...
Environment protection
Nature Protection
Construction
Spatial Planning
Water Resources
Procurement

As the Ministry of Environment and Spatial Planning has only recently been established as an individual ministry, its structure and organization are still developing. Currently there are three departments: one for the environment, one for spatial planning and one for housing and reconstruction. Within the environment department, there will be four divisions: general environmental policy, environmental protection, nature protection and water management. A legal division will assist all departments within the Ministry (see organizational chart of the Ministry of Environment and Spatial Planning). Currently the Environment Department has 69 staff members. Its budget is approximately US$ 600,000 for 2002.

However, this budget is allocated for the recruitment of new staff to strengthen the Ministry and not for project implementation. The Ministry is entirely dependent on donor contributions for projects. The ability to hire new staff is hampered by a small experienced labour pool and by salaries that are less attractive than those offered by the private sector.

The Spatial Planning Department has just started operating with four staff members. There are plans to expand it by the end of 2002.

The Ministry of Environment and Spatial Planning has five regional coordinators based in Prishtinë/Pristina, Prizren/Prizren, Pejë/Pec, Mitrovicë/Mitrovica and Gjilan/Gnjilane.[1] The regional coordinators liaise with the municipalities and monitor developments in their regions. They work within the General Policy Division of the Ministry.

Currently the Institute for Environment and Nature Protection (INEP) and the Kosovo Hydrometeorological Institute (KHMI) are subordinated to the Ministry. They were originally established by Kosovo law for monitoring and research and were a part of Serbia's network. As most of the equipment and databases have either been lost or destroyed, these institutes can barely fulfil their functions (see section on water). According to the draft environmental protection law, the two institutes will be merged into the Kosovo environmental protection agency.

Kosovo Trust Agency

In the beginning of 2002, the Kosovo Trust Agency (KTA) was established under the reserved powers of the Special Representative. KTA has "ownership" of all publicly and socially owned enterprises, including the large enterprises for drinking-water supply, waste collection and electricity generation and distribution. KTA has a supervisory board of directors, consisting of representatives from the Kosovo Government and UNMIK.

Policy objectives and management

The policy framework

Kosovo has been developing a strategy for sustainable development and environmental protection at the central level, with expansion at the local level. A draft short- and medium-term action plan was developed in 2001. Although the document is descriptive in nature, implementation is detailed in the donor assistance programmes that have been secured for environmental protection. These programmes do provide clear objectives and targets, but they also need to be integrated into the action plan.

The Environmental Policy Division intends to develop a strategic plan for international cooperation, information management and public awareness. Key staff have been recruited in these positions and other positions have been advertised. These staff will also work to consolidate the regional offices, develop clear guidance for reporting issues, develop procedures for donor documents, develop the Kosovo consolidated budget, and compile a state–of-the-environment report for Kosovo.

In addition to the draft short- and medium-term action plan, a comprehensive development framework has been developed as part of the ministerial budget. This document outlines the current situation, key issues, objectives and policies, and identifies priority actions, performance measures and costs within the context of the Kosovo budget and the public investment programme. The list contains very general priority actions without an indication of actor, deadline or measures of implementation. It is also foreseen to recruit a financial expert to develop this sector and,

[1] Place names used in this report follow UNMIK regulation 2000/43, Section 1.2, which states that official communications shall not contain any name for a municipality that is not set out in Schedule A, except that in those municipalities where ethnic or linguistic communities other than Serbian or Albanian form a substantial part of the population. In this case the names of the municipalities shall also be given in the languages of those communities.

in 2003, to introduce taxes for environmental polluters.

The action plan and the development framework are consistent, and reflect a common understanding of the priorities. However, there is no direct link between them.

Conclusions

The institutions have developed rapidly in the past three years, as has attention to environmental issues. There is, however, an uneven balance between the Environment Department and the Spatial Planning Department. The Spatial Planning Department was established later than the Environment Department, and it is currently developing its structure and competencies. However, there is already an understanding that close cooperation between the two is required to ensure environmental protection.

Top priority should be given to establishing and then strengthening the Kosovo environmental protection agency, which will be within the Ministry of Environment and Spatial Planning. For this purpose the funding from donors should aim to restore and develop further the environmental monitoring network and to provide the necessary equipment for monitoring laboratories and a database, as an integral part of the monitoring activities.

The Ministry should give greater attention to strengthening the Spatial Planning Department as a matter of priority. Many environmental problems, including the problems of illegal construction of houses, the untreated release of waste water and the supply of drinking water, can be prevented and regulated at the very beginning through spatial planning instruments.

Currently, the Ministry is entirely dependent on donor funding for the implementation of projects. Although there is a common understanding of priorities within the Ministry, a clearly structured environmental strategy and action plan could help to streamline and focus donor funding. In addition, local environmental action plans should be developed.

LEGAL FRAMEWORK

Introduction

The legislative basis for Kosovo lies in United Nations Security Council resolution 1244 of 1999 and the constitutional framework for self-government (UNMIK/REG/2001/19). The body of applicable law in Kosovo can be divided into three parts. First, there are the regulations issued by the Special Representative of the Secretary-General, and the administrative directions to guide their implementation and that of the instructions. In addition, there are the laws passed by the Kosovo Assembly and promulgated by the Special Representative under the transferred powers. Finally, based on UNMIK/REG/1999/24, there are the laws applicable in the territory of Kosovo prior to 22 March 1989.

In cases that are not covered by the above-mentioned legislation, the laws in force after 22 March 1989 may be applicable if they are non-discriminatory. Consequently, legislation from the Republic of Serbia, the Federal Republic of Yugoslavia, the former Socialist Republic of Yugoslavia, the Socialist Republic of Serbia and the Socialist Autonomous Province of Kosovo may be applicable. Due to these different origins, the body of law is extremely complex, and there is often uncertainty about the applicability of specific legislation. In addition, translations or even original laws are not always available to the legal departments. The box below provides one example of the current legal situation based on an overview of laws undertaken in 2000 that could be applicable to the Trepca Industrial Complex (see section on industry, environment and health).

Compliance and enforcement

The complexity of existing legislation and the lack of legislation for certain issues limit the application of regulatory instruments as a tool for environmental management. For example, the current body of law does not provide a legal basis for environmental inspectors. According to existing legislation, there are inspectors only for sanitation, agriculture, construction, communal areas and mining. Anticipating the development of an environmental law that would require environmental inspectors, the Ministry of Environment and Spatial Planning has employed five central environmental inspectors, but, since

they do not yet have any legal standing, they are unable to engage in any enforcement activities.

In addition, fines for non-compliance of many laws (mining, water, spatial planning) are expressed in the Yugoslav dinar and have not been adjusted to inflation. Because of the hyperinflation of the Yugoslav dinar in the early 1990s, the fines are no disincentive. In addition, the euro is now the base currency for all transactions. To solve this problem, the Legal Department of the Ministry of Environment and Spatial Planning has proposed that corrected fines and a specified exchange rate should be approved by the Office of Legal Support Services under the Special Representative.

UNMIK regulation 2002/5, establishing the Ministry of Environment and Spatial Planning, also prescribes its functions and responsibilities. One of these responsibilities is issuing environmental protection "guidelines". The regulation, however, does not state what their legal and enforceable status will be, nor how they relate to existing legislation and whether laws and regulations will fall within this definition of 'guidelines'.

UNMIK regulation 2000/32 established the Administrative Department for Environmental Protection and mandated it to develop a "regulatory framework for setting norms and standards" for environmental protection and for preparing "regulations", but the relationship between "regulations" and "guidelines" has not been clarified.

Another complicated issue is the export of hazardous waste. The Federal Republic of Yugoslavia is Party to the Basel Convention, and import-export permits are issued by the Federal Secretariat for Labour, Health and Social Care in Belgrade. As Kosovo is under the interim administration of the United Nations, it has been unclear who was the competent authority for authorizing the export of hazardous waste from Kosovo. Recently it was decided that, on a case-by-case basis, hazardous waste could be exported with special authorization of the Special Representative.

The Legal Department of the Ministry of Environment and Spatial Planning is currently developing an environmental protection law to solve a number of the above-described problems. A first draft was finished in June 2002. In addition to giving legal standing to environment inspectors, the law will oblige the Ministry to develop an environmental protection and sustainable development strategy. It also makes the development of an environmental protection programme compulsory, but leaves open the opportunity for municipalities to develop their own local environmental protection plans. If a municipality decides to develop such a programme, it should be in line with the national one. The law is currently being debated in a parliamentary working group and will shortly be forwarded to the new Kosovo parliament for adoption.

Box 1: Legislation that could be applicable to the Trepca Industrial Complex

Water:
Decree on the classification of waters, 1968 (Serbia)
Decree on the categorization of water streams, 1968 (Serbia)
Law on the protection of waters, 1976 (Kosovo)
Rulebook on dangerous materials in waters, 1982 (Serbia)

Air:
Rulebook on time periods and methods of measuring emitted hazardous materials into the air, 1974 (Serbia)
Rulebook on reports of measuring the quality of the air, 1974 (Serbia)
Decree of changes in the Law on the air, 1974 (Serbia)
Rulebook on the methods of measuring dangerous substances in the air, 1978 (Serbia)
Regulation for time limits and manner of providing report for performed measures in terms of air pollution (Official Gazette No. 6/74).

Source: Ministry of Environment and Spatial Planning, 2001.

Environmental permits and environmental impact assessment

Currently there is no integrated environmental permit requirement in Kosovo. The draft environmental protection law calls for environmental permits, issued by the Ministry of Environment and Spatial Planning, for activities that require an environmental impact assessment (EIA). In addition, for a second category of activities, environmental authorization by the Ministry of Environment and Spatial Planning would be required. The draft environmental protection law is a framework law and, therefore, does not provide details on the kind of activities that would require either an EIA or environmental authorization. These details will be spelled out in regulations after the approval of the law. In the draft law, authority for regulatory instruments is centralized within the Ministry and competences are delegated to the municipalities. An exception is the appointment of municipal environmental inspectors, who would have responsibility for environmental concerns that can be "controlled and prevented" by the municipalities themselves.

The Ministry of Trade and Industry (Directorate of Mines and Minerals in the Department of Public Utilities) does issue a quarry licence, which requires an EIA. Until the draft environmental protection law is adopted and an EIA regulation developed and approved, EIA is carried out on the basis of certain minimum requirements, including delineation of the project and its expected environmental impacts, an evaluation of alternatives to the proposed project and compensation for environmental impacts. To identify the impacts, a *Leopold matrix,* outlining all the steps, from construction to decommissioning, and all the potential environmental impacts, needs to be filled in. A Mining Advisory Board, in which the Environmental Protection Department is represented, has been set up. A quarry licence requires both approval by the Mining Advisory Board and consent from the affected municipality.

The quarry licence also requires the deposit of an environmental bond to guarantee rehabilitation of the site after decommissioning. The Directorate of Mines and Minerals collects the bond on behalf of the Ministry of Environment and Spatial Planning. For sand and gravel extraction, the bond is €500 (US$ 447); for hard rock, it is €2500 (US$ 2,240). In addition, royalties have to be paid for the extracted amounts of construction material: €2.5 (US$ 2.24) per m^3 of sand and gravel, and €1 (US$ 0.89) per m^3 of hard rock. The municipalities, which receive half of the royalties, assess the excavated amounts. Reportedly, in certain municipalities, these royalties generate up to 85% of all income. The other half of the royalties goes to the Kosovo budget. As more quarried material is entering from other parts of Serbia and from the former Yugoslav Republic of Macedonia, the Ministry of Trade and Industry is considering lowering the royalties. Approximately 100 quarry licences have been issued so far. The Department of Mines and Minerals estimates that this is 25-30% of the 300 to 400 quarry operations (both large and small). The quarry licence is a good example of integrating environmental concerns into a key sector.

Conclusions

Kosovo's legal framework is particularly complex. The challenges to the United Nations administration and the provisional institutions for self-government with the implementation of UNSCR 1244 are numerous. The efforts of the Ministry of Environment and Spatial Planning to establish a solid legal foundation for its mandate for environmental protection are marked by the development of a comprehensive draft environmental protection law and the proactive anticipation to its adoption; environmental inspectors have been employed and a 'soft' environmental impact assessment procedure established as part of the quarry licence. Until the new law has been adopted, however, the Ministry remains largely powerless to fulfil its mandate to protect the environment.

WASTE MANAGEMENT

Introduction

Waste is a major environmental challenge in Kosovo. The problems stem from both municipal waste and industrial waste, especially the tailings from former mining and flotation facilities. Old waste sites did not have waterproof linings to prevent polluted seepage from entering the

groundwater, nor were they covered with inert material to keep rainwater out of the dumpsite or gas extraction systems to prevent methane explosions.

Programmes of assistance, primarily from the European Agency of Reconstruction (EAR), the Danish Agency for Development Assistance (DANIDA) and German Technical Cooperation (GTZ), have led to significant improvements in waste collection and disposal since June 1999. Some of the uncontrolled dumps have been rehabilitated, with open surfaces now covered and a layer of clay to reduce the infiltration of water into the site. However, the majority of sites will continue to pollute the groundwater. These sites are vented, but, owing to their size and the expense involved, none has a gas extraction system.

EAR has financed a programme of investments into the rehabilitation of old uncontrolled landfills and a programme of engineered regional landfills. The key priority for the Environment Department will be to ensure that these sites are licensed and operated in accordance with defined environmental objectives and set standards. A phased incremental approach to controls that meet European standards for landfilling and other waste management activities is expected and policies will be developed to achieve this. Separation and recycling of potential secondary resources from municipal waste will not contribute significantly to resource savings without massive investment in the collection and recycling infrastructure, as well as in public participation and awareness raising. This is currently well beyond the available resources. The major gains are to be found in recycling and reusing commercial and industrial waste. If investment is available it should be targeted at commerce and industry. Here small investments in waste minimization and recycling techniques can produce significant reductions in waste requiring disposal. Schemes targeted at household waste should be undertaken only when they can be demonstrated to be commercially viable without large public subsidy.

Municipal waste

Municipal services for the collection, transport and disposal of municipal waste predominantly cover urban areas, but they are now being expanded into rural areas. According to the 2002 Human Development Report, the total population is estimated to range between 1.8 and 2 million; about 35% of the population in Kosovo lives in urban areas and 65% in rural areas. About 60-80% of all municipal waste is collected in urban areas; rural areas have almost no public services. There are no recycling facilities in Kosovo except for some minor initiatives such as aluminium cans collected for a small smelter in Janevë/Janovo, and a non-functioning paper and plastic recycling plant.

Nine new landfills are planned. Eight of these are currently in the design phase or under development and construction. Two that will serve single municipalities that are too remote for waste transport. (Funding has not yet been secured for one of the regional landfills.)

Following the 1999 conflict virtually all waste collection ceased. There has been considerable improvement as a result of donations of funds and equipment from the international community**,** but equipment and transport are still inadequate for the proper collection and disposal of all municipal waste.

There are 30 municipalities in Kosovo, and waste is either dumped at individual or regional landfills. In a number of municipalities, dumpsites have been rehabilitated and are being used by waste companies until regional or new landfills can be completed. Rehabilitation has been undertaken in Gjakovë/ Dakovica, Gllogovc/ Glogovac, Istog/Istok, Klinë/Klina, Kamenicë/Kamenica, Mitrovicë/Mitrovica, Lipjan/ Lipljan, Rahovec/ Orahovac, Podujevë/Podujevo, Suharekë/Suva Reka, and Ferizaj/Urosevac.

In Novobërdë/Novo Brdo, Obiliq/Obilic, Pejë/Pec, Skenderaj/Srbica, Shtime/Stimlje, Vushtrri/Vucitrn, and Zubin Potok/Zubin Potok, the dumps have been decommissioned. In the remaining municipalities, dumpsites have not been rehabilitated and are still in use. For example, the present dumpsite for the largest municipality, Prishtinë/Pristina, is situated about 2 km from the city. The waste is not covered daily with a layer of earth; there is no drainage system and no monitoring. Parts of the waste site are regularly burned by scavengers, resulting in high emissions of dioxins. The regional landfill for Prishtinë/Pristina is currently in the tender procedure and will also serve the local municipalities.

A general plan for future solid waste disposal is presented at figure 1.

Table 1: Mines and tailing sites

	area (ha)
Mines and tailing dumps in Mitrovicë/Mitrovica	2,700
Waste dumps, battery factory	215
Mines and tailing dumps in Kishnica and Ajvali/Ajvalija	1,200
Waste site super phosphate factory	320
Mines and waste dumps, Ferro-nickel plant in Gllogoc/Glogovac	1,700
Opencast lignite mines and ash dumps in Obiliq/Obilic	4,000

Source: Ministry of Environment and Spatial Planning, 2001.

Currently the price for waste collection and disposal is €2.5 (US$ 2.24) per household per month. At present revenue collection stands at 20 –30%.

Industrial waste

Most industrial waste was generated from mining activities and concentration processes of non-ferrous metals, super phosphate production, battery factories and the combustion of lignite for electricity production (See also section on industry, environment and health). At present industrial waste dumps and opencast mines cover more than 10,000 hectares. The biggest mines and tailing sites are listed below.

No activities have been undertaken to rehabilitate or reduce the risk from industrial waste sites. For example, the tailing dumpsite of the Trepca Metallurgical Complex near Mitrovicë/Mitrovica is covered by municipal waste. There is a river just at the bottom of the site. Drainage water from the tailings is polluted with soluble hazardous substances and eventually ends up in the Sitnica and Iber rivers. Both rivers are suspected of being polluted by heavy metals. Natural disasters, or even heavy rain, could result in the collapse and sliding of the tailings and municipal waste causing acute and severe pollution of the river. Another problem associated with the dumpsite is the spreading of dust, including heavy metals, into the city of Mitrovicë/Mitrovica and its surroundings. It is evident that the implementation of protective measures is a matter of priority here.

The ash dumpsites of the thermal power plants in Obiliq/Obilic also cause environmental problems. Ash is transported to the dumps by a hydraulic system with recycled water from coal drying and coal gasification. This water is contaminated with phenols. Since there is no drainage or treatment system, the polluted water can easily enter the groundwater. This site, which covers productive land, also generates dust and has adverse health effects on the local population.

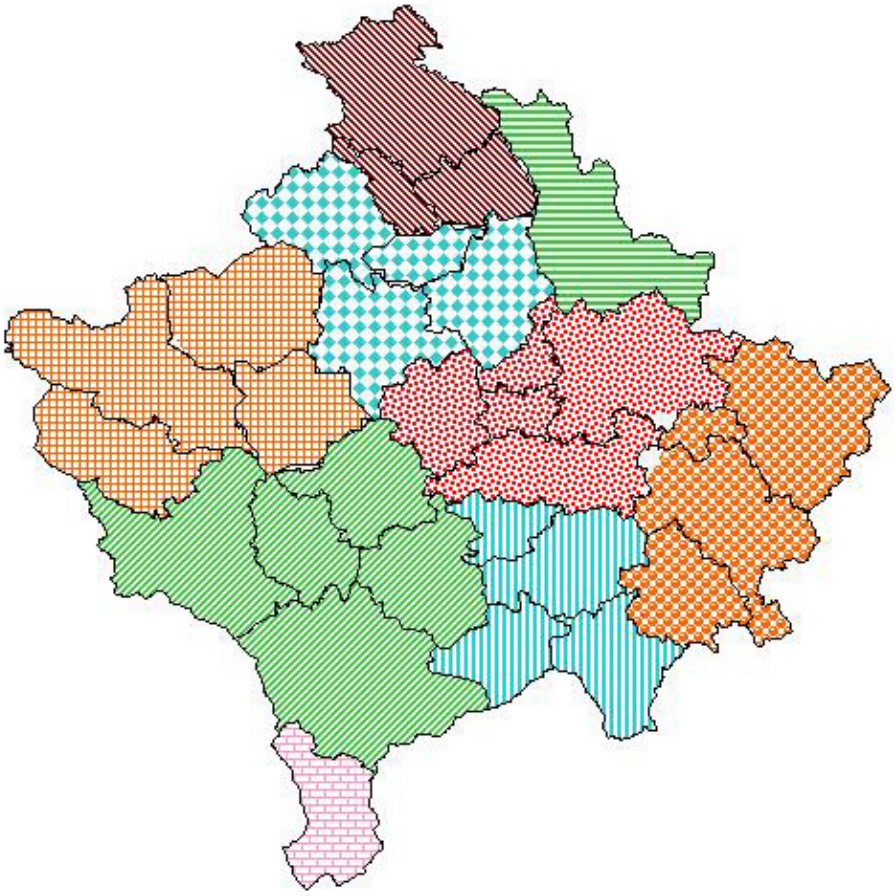
Hazardous waste and chemicals

Hazardous materials and waste are currently stored in deplorable conditions at many sites in Kosovo, mainly in the industrial complexes where they were used or generated. There are no proper storage facilities for hazardous waste, although there is a plan to build temporary storage facilities. At some industrial sites where there is an immediate danger to life or the environment, the risks have been reduced.

For example, there are significant quantities of hazardous waste at the industrial site of IBG Batteries, in Gjilan/Gnjilane, left over from previous industrial processing. About 2,000 m^3 of hazardous liquid waste, containing nickel, cobalt, cadmium and other hazardous components, are stored at this facility. The exact composition of the mixed hazardous waste is not known. The facility does not meet sanitary requirements for hazardous waste storage. There are no waterproof floors, no spillage basins or other emergency measures. In addition, some drums are open, rusted and damaged.

There are plans to concentrate all hazardous waste in a single location in Kosovo to better contain the risks. The Environment Department of the Ministry of Environment and Spatial Planning and KTA are responsible for planning and implementing this project. Speeding up implementation of this project is an urgent task in order to prevent further contamination of both the IBG site and residential areas in its vicinity. There are many similar sites that need urgent intervention and risk reduction.

Figure 1: Landfills in Kosovo



	LOCALITY	POPULATION	VOLUME (m3)	DONOR
	Prishtinë/Pristina	700,000	5,000,000	EAR
	Zveçan/Zvecan	50,000	300,000	EAR
	Podujevë/Podujevo	100,000	700,000	EAR
	Gjilan/Gnjilane	200,000	1,200,000	EAR
	Prizren/Prizren	500,000	2,500,000	EAR
	Dragash/Dragas	20,000	150,000	EAR
	Pejë/Pec	300,000	1,500,000	EAR
	Ferizaj/Urosevac	200,000		?
	Mitrovicë/Mitrovica	250,000		DANIDA

Source: European Agency for Reconstruction.

Medical waste

Before the conflict, medical waste was collected and openly burnt at the hospital premises or collected with municipal waste and dumped at municipal waste sites. Over the past two years the following measures have been taken:

- Introduction of a three-container system: yellow bag for infectious waste, black bag for general waste and containers for needles;
- Installation of *De Montfort* incinerators – small and easy to build – for burning infectious waste; and
- Providing training materials for hospital staff involved in medical waste management, including the organization of a regional seminar on healthcare waste management.

At present one big and three small incinerators for medical waste have been installed in the main hospitals in Kosovo. The capacity of the incinerator in Prishtinë/Pristina University Hospital is 200 kg of medical waste per hour. According to the Ministry of Health, the incinerator in Mitrovicë/Mitrovica works efficiently and at full capacity. As a result of these measures, medical waste management in Kosovo has improved considerably.

Environmental and health effects

Despite the improvements in waste management, there are still significant risks to human health from landfills and the storage of hazardous waste. Not all medical waste is being handled separately, and some of it still ends up with municipal waste in landfills. Scavengers, including many children, run the risk of being infected by needles, bandages and other medical waste. In addition, smoke from the burning areas of dumpsites contains toxic pollutants.

Many municipal waste dumps are situated near residential areas, especially in rural regions. Surface water and rain water leach soluble toxic substances from the waste, including products of waste decomposition, and penetrate into groundwater that is used by the population for drinking water. There is no monitoring of water quality in rural areas, nor is there a warning system in case of groundwater pollution. There is a serious risk to the population of drinking-water contamination, resulting in water-borne bacteriological diseases.

Because most industrial activities have stopped, the main threat from industrial waste comes from storage remaining from past activities. Possible adverse health effects include dust from ash dumps, seepage from tailings and potential emergencies with hazardous waste.

Policy objectives and management

The policy framework

At present there is no strategy for the environmentally sound management of waste in Kosovo. The Environment Department's draft short- and medium-term action plan for environmental protection does not have a separate section on waste, but waste management activities are foreseen in the section on environmental compliance monitoring and licensing. Activities would include, for example, waste management regulation including licence supervision (inspection) and enforcement regulation, covering also hazardous waste (waste storage, movements, treatment and disposal).

The Ministry of Environment and Spatial Planning prepared a draft position paper on "solid waste management in Kosovo: status report, strategies and policies" in July 2002. It contains useful information on waste management, including the current situation, institutional responsibilities and requirements for the construction of environmentally sound or engineered landfills. However, it does not provide strategic direction for the development of the waste management sector.

A position report should be seen as the starting point for the development and adoption of a waste management plan. This will include policies, strategies and action plans to ensure that there is capacity to manage all waste produced in Kosovo. Developing, updating and revising a waste management plan will require:

- Surveying and reviewing the waste types and quantities produced in Kosovo;
- Maintaining and updating a register of waste management capacity, including landfill sites for hazardous, non-hazardous, construction and demolition waste categories, waste transfer facilities, storage, treatment, recycling, recovery, reuse;
- Identify gaps in the short-, medium- and long-term provision of waste management;

- Identify stakeholders such as waste producers, carriers, managers and disposers of waste, and review the need to manage and remediate sites;
- Review options and scenarios;
- Identify planning needs and make provision for waste that cannot be managed in Kosovo.

It will be important to ensure that any waste management strategy and actions plans are kept under review and to set targets for all involved in waste management.

The draft position paper also calls upon KTA to provide an EIA for each landfill to the Environment Department for approval. The municipal public enterprise should also submit plans for the operation of new landfills. They should specify the size, location and sequence of the areas to be filled with waste, the methods of waste emplacement and soil covering to be used, the responsibility of staff at the site, the methods of waste registration and other routing maintenance.

The legal framework

The draft environment protection law of June 2002 covers waste management. It defines all types of waste, including hazardous waste. For example, article 25 prescribes the legal, managerial and technical aspects of waste management. This law will prohibit the storage and import of radioactive waste. It will provide a good legal basis for proper solid waste management, and adoption of the law is a priority for Kosovo. Problems associated with the export and import of hazardous waste are also discussed.

In addition to the draft environmental law, a draft regulation on the solid waste sector in Kosovo has been developed by UNMIK. It covers the municipal waste service, the institutional aspects of waste management, including licensing, the privatization of waste services and the development and implementation of a future waste management strategy. It prohibits the dumping of all hazardous waste (hospital, radioactive and other toxic waste) as well as of certain other identified types and quantities of waste. The draft regulation is in compliance with European Union norms and standards.

Kosovo has also developed minimum standards for solid waste disposal to land. These cover rehabilitation standards for existing landfills, a description of minimum engineering works at the landfills, waste disposal operations, environmental monitoring, and conditions for temporary controlled storage of waste. However, these should be seen as interim measures and must be kept under review to ensure that they provide for actual environmental protection in the light of the experience with their implementation. The review should provide a step-by-step platform for environmental protection equivalent to that in the EU.

The institutional framework

The Ministry of Environmental Protection and Spatial Planning, through its Environment Department, is the competent authority for monitoring, supervising and regulating the environmental aspects of waste management. Its responsibilities include the development and implementation of general environmental policy, the management of hazardous waste, chemical safety, and the development of a cadastre for pollution discharges and waste.

KTA is involved in the overall management of municipal waste. It coordinates donor support and develops strategic waste management plans. Its responsibilities include the decommissioning of uncontrolled municipal waste dumps and the construction of new sanitary landfills.

The Public Utilities Regulatory Commission (PURC) is involved in the economic and operational aspects of waste management (development and implementation of regulations and waste management tariffs).

Together, KTA and PURC manage the municipal public service enterprises. KTA is responsible for all the waste companies; PURC for all economic regulation; and the Ministry of Environment and Spatial Planning for all environmental regulation in the waste sector. Municipalities are still responsible for ensuring that services reach all their citizens (Law on the Collection, Transport and Handling of Waste, No. 25/84).

It should be noted that the Ministry, KTA and PURC have worked closely together in the decommissioning of uncontrolled dumps and the establishment of seven regional and two municipal landfills.

International cooperation in waste management

The most active aid organization for waste management in Kosovo is EAR, which is

responsible for all EU assistance in Kosovo. Its waste-related activities cover:

- Providing the equipment for municipal waste dumps. For example, in May 2002, nine bulldozers worth €1.1 million (US$ 0.98 million) were provided to KTA for distribution to Kosovo's municipal waste disposal service;
- Construction of new sanitary and controlled landfills according to EU standards. About €15 million (US$ 13.4 million) have been allocated to improve standards and norms for the municipal waste management system. At present, 3 engineered landfills are under construction; the sanitary conditions at about 19 municipal waste dumps have been improved during the past year and another 20 sites are being rehabilitated. Municipal landfills are being built in Podujevë/Podujevo, Zveçan/Zvecan and Gjilan/Gnjilane, and new construction should begin in Prizren/Prizren, Prishtinë/Pristina and Dragash/Dragas at the end of 2002. At these sites waste will be compacted, covered by a layer of clay, and topped with soil and grass. Such a method reduces the risk of air and groundwater contamination by toxic substances.

The Danish Government financed an environmental programme in the Mitrovicë/Mitrovica region that included municipal solid waste management and capacity building, and GTZ did so in the Prishtinë/Pristina and Prizren/ Prizren regions.

Conclusions

The rehabilitation of old uncontrolled sites for municipal waste disposal and the construction of engineered landfills according to agreed minimum standards have begun and need to be completed. These standards and specifications should be kept under review and revised in accordance with monitoring and environmental performance assessment of the sites. There should be a policy of incremental progress towards EU standards. The separation and recycling of potential secondary raw materials from municipal waste could contribute to resource savings and environmental protection as a whole, but may not be cost-effective in the short term. Waste minimization and recycling efforts should be contracted on a commercial basis. For industrial waste priority should be given to the areas where the biggest reductions can be made. In this connection, raising public awareness about waste management is essential.

A number of positive changes in industrial and municipal waste management have taken place in Kosovo during the past three years. To further improve the situation, the following measures could be taken:

- Enhance managerial capacity for waste management and introduce waste separation and recycling when market conditions and capacity can be provided;
- Speed up the adoption and implementation of the draft environmental protection law and develop regulations for its implementation;
- Further develop and adopt an overall waste management strategy based on the draft position paper on waste management; produce and maintain a waste management plan;
- Fully segregate and incinerate medical waste;
- Rehabilitate existing contaminated industrial sites;
- Install fences and warning signs around uncontrolled municipal waste dumps until they can be restored;
- Carry out sanitary inspection of tailing dumps and the municipal waste dump in Mitrovicë/Mitrovica and monitor the site to prevent an environmental disaster;
- Introduce a monitoring system for existing and new landfills for municipal and industrial waste, including in rural areas;
- Extend waste services to rural areas;
- Strengthen the role of the public in the decision-making process and raise its awareness on waste management. This includes providing information on the separate collection, reuse and recycling of waste, including in rural areas.

WATER MANAGEMENT

Introduction

Kosovo's watershed encompasses four river basins that drain into three seas: the Adriatic, the Aegean and the Black Sea. The Drini i Bardhe is the largest of the four basins (4649 km^2); the second largest is the Iber river basin (4009 km^2), which includes the mountain area in the north of Kosovo. The third

basin is the Morave e Binges (1564 km^2), and the fourth is the Lepenc basin (685 km^2) in the south of Kosovo.

There are practically no natural lakes in Kosovo. Owing to the high flow variations, six reservoirs have been constructed with a total volume of 2,700 million m^3. They are used for water supply, fishery, irrigation, recreation and flood protection.

River water quality in the lowland rivers is very poor owing to the lack of waste-water treatment and waste disposal, while the upstream rivers are mostly of very good quality. The main rivers downstream of larger municipalities and industries are so heavily polluted that the water cannot be used for water supply or irrigation. Groundwater quality is also affected by pollution from untreated waste water from municipalities and industries.

Water use and pressures on the water resources

Water supply and sewerage

Forty-four per cent of the total population, and only 8.4% of the rural population, has access to the water distribution system. People in rural areas rely on village water-supply systems, their own wells or on springs and surface water. Rural wells are generally in bad condition and the water quality is poor, owing to organic contamination.

Water service is limited by several problems, such as pipe breaks, interrupted power supply and limited storage capacity. Water distribution networks are generally very old and in poor condition as they suffer from a lack of investment and maintenance. Few utilities are able to provide adequate amounts of water to the population. There is an ongoing problem with the collection of fees for water use, owing, in large part, to the lack of functioning water meters.

There is no waste-water treatment in Kosovo. Only 28% of homes are connected to a sewage system. In villages and other small settlements, waste water is disposed of in open channels, which contaminate surface and groundwaters, resulting in poor-quality drinking water from wells. As a result, there is a high incidence of water-borne diseases.

Industrial waste water is not treated either, and the effluent is discharged directly into the rivers. Because there is no monitoring, there is no reliable information about the water quality of the rivers.

The World Health Organization (WHO), in cooperation with the Institute for Public Health, has developed and distributed instructions to local and international NGOs and communities on standard methods of water sampling, the minimum standard of rehabilitation, protection and disinfection of wells and the frequency of routine sampling for drinking water from the distribution system in each municipality. Municipal sanitary inspectors were trained by WHO and the Institute to carry out the sampling and reporting. In 2000, as part of the routine sampling of the urban drinking-water network, 4000 samples were taken in Prishtinë/Pristina and between 600 and 1000 in Pejë/Pec, Prizren/Prizren, Gjilan/Gnjilane, Gjakovë/Dakovica and Mitrovicë/Mitrovica. The results show that water companies have improved drinking-water quality since early 2000; however, there are ongoing failures. This can be attributed to a number of factors, including the poor state of the network, the lack of chlorine and chlorination points, and, in some cases, poorly protected water sources. As a result, drinking water poses significant risks of water-borne bacteriological diseases.

Box 2: WHO Healthy Villages Project

The Healthy Villages Project is an initiative of the World Health Organization (WHO) to improve the health of villagers in Kosovo. The project focuses on: community health education and improvement of sanitation facilities in the villages; hygiene training and capacity building; and water-quality control and inspection.

WHO has brought together the leading NGOs, the Institute for Public Health and other agencies to develop an approach to providing a comprehensive package of improvements to the villages. The key principle is participatory decision-making from the village communities, which take responsibility for determining what improvements are needed and establishing priorities from a fixed amount of money and materials. Some villages added their own money to the project. The villagers also undertake most of the physical work, from rehabilitating wells and building latrines to constructing water distribution systems, reservoirs and sewage systems with septic tanks.

The project is currently being developed in 68 villages across Kosovo, with 729 rehabilitated wells, 52 new wells, 8 pump stations, 7 spring catchments and 6 sewage systems.

Agriculture

Agricultural production is vital in Kosovo; arable land totals 350,000 ha (32%), of which 77,000 ha (22%) are irrigated. There are currently six irrigation schemes, which have recently been rehabilitated through EAR. In addition, individual farms irrigate their land with simple sprinklers; even drinking water is abstracted illegally for irrigation. Irrigation is one of the biggest water users, even though Kosovo's water resources are relatively small compared to the population and the amount of arable land.

Table 2: Irrigation schemes in Kosovo

	area (ha)
Istog	12,440
Drini I Barde	16,310
Lumi i Barde	11,525
Radoniqi	11,350
Dukagjini	5,000
Iber Lebenc	20,000
Total	**76,625**

Source: Development of Institutional Framework with Resources Management Policy in Kosovo. December 2001.

Because there is little use of fertilizers and pesticides at the moment, their impact on water quality is relatively low. However, this situation is likely to change in the near future, and it is important that policies be developed now to address the potential risk of chemicals running off into the soil and water system.

Flooding

Flooding is a significant issue in Kosovo, in particular where high water flow from the mountains reaches the lowlands and the lower valleys. The last major flooding was in 1979, but it could always recur. With the recent rebuilding of houses following the conflict, there are now many homes on floodplains that are at risk.

Industry

There was significant pollution of rivers from industrial activities prior to the 1990s, but, over the past decade, most industrial production has ceased. The quantity of water contaminated by industrial effluent discharged in the main river systems in 1984 was 82,375,000 m^3. The largest amount of effluent was discharged into the Sitnica, essentially making the Sitnica-Iber river system an open drain of industrial effluent. Waste water from Kosovo's thermal power plants, the electrical industry of Obiliq/Obilic, the Trepca industrial complex, and ferrous-nickel production was all discharged into the river systems. As a result, large quantities of organic and inorganic compounds were released into the water.

Monitoring of the quality of Kosovo's rivers during 1980s showed that the pollution of rivers by organic compounds was marked, especially in urban rivers and streams. Consequently, some rivers had no or very low levels of dissolved oxygen – essential for supporting a varied and healthy aquatic ecosystem – especially during months when overall water volumes decreased considerably. The rivers were also polluted with heavy metals, such as lead and zinc, especially those in the region of Mitrovicë/Mitrovica. Parts of the Prishtevka, Sitnica and Iber rivers were assumed to be dead.

An improvement in water quality was observed as a result of the trade embargo against the Federal Republic of Yugoslavia. Many industries were forced to reduce their activities, or even shut down, and consequently environmental pollution decreased. The remaining sources of pollution are the mines, whose acidic drainage contaminates ground and surface water with heavy metals.

Other current sources of contamination are the tailing piles of the concentrators and chemical storage tanks at the industrial complexes, which pose a serious threat to surface and groundwater quality. In September 2000, a major leakage of concentrated sulphuric acid occurred at the Mitrovicë/Mitrovica Industrial Park. The content of a 597 m^3 tank poured onto the ground and further to the river Sitnica, where it killed all aquatic life.

Policy objectives and management

The policy framework

A 20-year water master plan was adopted in 1983. It needs to be renewed and updated, which will be the main task of the Environment Department's new Water Management Division. A strategy for irrigation is also needed and should be prepared by the Ministry of Agriculture, Forestry and Rural Development.

The legal framework

The most important law on water management in Kosovo is the Law on Waters of 1976 (No. 30/76), which covers the main aspects of water use and management. The Law is largely outdated and no longer applicable to the present institutional arrangements.

The legal section of the Environment Department is currently drafting a new law on waters. A draft regulation on the public water supply system was finalized in June 2002 and is now being circulated. It will regulate the activities of all public water utilities, especially the sale, quality, and reliability of drinking and irrigation water, and waste water.

The Environment Department prepared another draft regulation on the classification of waters and the determination of hazardous materials in water in 2001. The draft environmental protection law also includes an article on water protection to prohibit or limit discharges of harmful and hazardous substances into water in accordance with prescribed legal acts, a governmental water programme, and other measures taken for the protection and improvement of water quality.

The institutional framework

Water issues are dealt mainly by the Ministry of Environment and Spatial Planning (development of water policies, water monitoring and protection); the Ministry of Agriculture, Forestry and Rural Development (irrigation), the Ministry of Health (monitoring and protection of drinking-water quality); KTA (municipal administration); and PURC (regulation).

The Environment Department of the Ministry of Environment and Spatial Planning has had a mandate for the overall management of water resources since October 2001. Its Water Management Division is responsible for policy development and the implementation of water resources management. Key areas still need to be further defined and developed. These include the creation of a database of water users and discharges, and subsequent licensing arrangements, the re-establishment of the hydrometric network and meteorological stations, and the clarification of the legal situation with regard to water management. The Division is underdeveloped at the moment, and there is a serious need to recruit water experts to fulfil its tasks.

Before the conflict, the Kosovo Hydrometeorological Institute (KHMI) was responsible for meteorological and hydrological monitoring. Since November 2000, it has been part of the Environment Department and is responsible for checking the quality and quantity of surface and groundwater and supplying information to users through a monitoring network. However, no monitoring takes place, because the hydrometric network was destroyed in 1998. The network had consisted of 33 river gauging stations and had started measurements in 1923.

The newly created KTA, which is under the reserved powers of the Special Representative, has the authority to administer publicly owned and socially owned enterprises that are registered or operating in Kosovo. Its goal is to promote the restructuring and privatization of the enterprises in which it holds shares. Non-viable companies will be liquidated or reorganized through bankruptcy. The 34 public water utilities are now under KTA administration. KTA has plans to consolidate them into four regional river-basin utilities to make them more efficient and cost-effective.

PURC regulates the tariffs and services of the public utilities.

The Ministry of Environment and Spatial Planning has recently created a water management board, which will take an integrated approach to water resources management. In the meantime, the Water Task Force, composed of the Ministry of Environment and Spatial Planning, the Ministry of Health, KTA and PURC, will integrate the different perspectives and concerns of the stakeholders in its discussions.

International cooperation

EAR has recently started a project to rehabilitate the hydrometric network in Kosovo. River gauging stations will be rebuilt and some meteorological stations will also be restored. Part of the project is building KHMI capacity, including recruiting staff, upgrading the facilities and providing training. The project aims to rehabilitate the network by the end of 2002. The Government of Finland has, among other things, supported the preparation of a strategy for water resources management policies in Kosovo. The Government of Italy is helping to strengthen the technical monitoring capacity of KHMI, to promote environmental awareness and train local environmental staff and to develop a new environmental monitoring laboratory.

Conclusions

Kosovo's water resources are currently poorly managed and underused. At present less than half the total population, and less than one tenth of the rural population, has access to the water distribution system. The water distribution network is in poor condition, and water pollution by untreated waste water from industry and sewage is significant, causing serious health risks to the population. However, there is a huge potential for improving the use of the water resource, which will support the development of agriculture, industry and other sectors.

The water distribution system needs to be rehabilitated and expanded to improve the current situation both in urban and in rural areas. The planning, development, construction and effective operation of sewage systems and waste-water treatment plans have also to be initiated. It is necessary to deal with this issue now in order to prevent further, and especially future, domestic and industrial pollution of surface waters and soils. Public awareness about the environment, water and health needs to be raised.

Water management has recently become the overall responsibility of the Environment Department, but its competencies are not well defined. The Department lacks expertise in this field. In addition, there is no reliable information of water use in Kosovo and no systematic environmental quality monitoring. The Hydrometeorological Institute is now responsible for checking the quality and quantity of surface and groundwaters, and supplying information to users by establishing a monitoring network. But it, too, lacks human resources and equipment, although this is being addressed by international organizations.

To improve the overall situation, the Water Management Division of the Environment Department needs to become strong and efficient, able to organize water resources management, including control, monitoring and water protection. This could be achieved with clearly defined competencies of water management authorities, the recruitment and training of staff, and the reconstruction of data collection and monitoring systems.

The 1983 water master plan is outdated and should be updated soon. It should include well-defined policy priorities in order to provide a basis for the sustainable use of water resources. All stakeholders should be involved in the process.

The legislation on water management is no longer applicable to the present institutional arrangements. New legislation is needed, complemented with capacity building to ensure adequately trained human resources for implementation. Currently, the Environment Department is drafting new laws and regulations. The development of the new law on waters is important to provide a framework for the management of water resources. Good coordination and cooperation with all institutions and ministries involved in water management is crucial.

MINERAL RESOURCES

Introduction

Kosovo has large reserves of a number of mineral resources, including lead, copper, silver, gold, bauxite and gravel, as well as Europe's largest reserves of lignite.

Mining in Kosovo, and specifically in Trepca, in the region of Mitrovicë/Mitrovica, has a long history, beginning with the Romans. Modern mining dates back to 1927, when the British Trepca Mines Limited company established mining facilities in Stari Trg. In 1939 the Zvecan Metallurgy Complex was built, and the mining and metallurgical industry continued to develop over the next decades, until the end of the 1980s.

To a great extent, the regional economic development of Kosovo and the whole of Yugoslavia depended on the huge mining and metallurgical industry, for both domestic use and export. In addition, in Kosovo and especially in Mitrovicë/Mitrovica, the mining and metallurgical industry was the major employer, and its demise has had considerable negative social effects in the region.

Restarting mining and metallurgical activities is essential to the further economic development of Kosovo. This will require the introduction of new technologies, the rehabilitation of mines, old industrial sites and disposal facilities for tailings from flotation processes. Economic recovery will

depend on both foreign and local investment, but the problem of liability for past environmental damage is a significant obstacle to investment in this sector.

Reserves of mineral recourses

Kosovo has large deposits of lead and zinc sulphide ores, coal, and sand and gravel (see table 3).

In addition lead-zinc ores can contain silver (112 to 170 g per ton), and silver extraction also took place in Kosovo.

The total reserves of bauxite are estimated to be between 6 and 7 million tons. The reserves of ferronickel are approximately 14 million tons in two districts, while the estimated reserves of magnesite in Strezofc/Strezovce and Golesh are 2.8 million tons and 1.7 million tons, respectively.

The quantity of estimated lignite resources varies between 11 and 18 billion tons in the Klinë/Klina and Prishtinë/Pristina basins. The ash content of the lignite is estimated to range between 13 and 20%, which creates large amounts of ash for disposal. The moisture content of lignite ranges between 42 and 49%, considerably reducing its heating value. It should be noted that the sulphur content is not high (between 0.35% and 1.5%), but, since there is no SO_2 purification equipment at thermal power stations, the emission of SO_2 is a very serious environmental concern.

Kosovo is also rich in limestone and gravel, which are used as construction materials. Limestone quarries operate mainly in Gnjilane/Gjilan, Gllovovc/ Glogovac, Lipjan/ Lipljan, Ferizaj/ Urosevac and Kaçanik/ Kacanik. Due to the high demand for construction materials, there are about 200 small sand and gravel operations in riverbeds. Often these small operators abandon the extraction site without any rehabilitation, leaving the riverbed destroyed. The Directorate of Mines and Minerals of the Public Utilities Department of the Transitional Department of Trade and Industry issues licences for all mineral exploitation operations and mining facilities, but only a small percentage of these quarries have been licensed so far. During the licensing procedure the Ministry of Environment and Spatial Planning is consulted.

The only operational large-scale mineral exploitation in Kosovo is the opencast mining of lignite in the Obiliq/Obilic region. This lignite fuels the two thermal power plants of Kosovo.

Environmental impact

The processing of lead and zinc ores generated different kinds of pollution: overburden from mining; tailings from concentration processes; sludge and filter residue; air pollution from sulphur dioxide and dust, including dust containing heavy metals; and water pollution from heavy metals. (See also the section on industry, environment and health.)

At present the main environmental problems from the mining and metallurgical industry are the huge dumps of tailings and old mines. About 4,600 ha are occupied by mines and tailing dumps. In addition, opencast lignite mines and ash dumps in Obiliq/Obilic take up about 4,000 ha. (See also the section on waste.)

The environmental effects can be summarized as follows:

- Deterioration of large areas of land, which can no longer be used for agriculture;
- Disfigurement of the landscape from tailings dumps and old mines which are no longer in operation;
- Toxic dust from tailings and ash dumps resulting in respiratory diseases and cancer among the local population;
- Release of toxic gases from tailings, with consequent health risks to the local population and the environment;
- Contamination of surface and groundwater by heavy metals in the vicinity of dumps (lead, zinc, nickel); and
- Potential for major contamination of the territory in the event of a natural disaster (e.g. flood, earthquake).

The rehabilitation of these dumps and the introduction of a monitoring system for surface and groundwater as well as for air are urgent tasks for the Ministry of Environment and Spatial Planning and the Ministry of Trade and Industry.

Table 3: Estimated reserves of mineral resources

Region	Quantity of ores (in million tons)	Quantity of Pb (tons)	Quantity of Zn (tons)
Belloberdë/Belo Brdo	3.7	321,900	288,600
Crnac:	2.4	276,120	82,600
Stantërg Fshati/Stari Trg	9.0	630,000	387,000
Ajavalija:	2.9	266,800	490,100
Novo Bërdë/Novo Brdo	3.6	183,600	273,600

Source: Directorate of Mines and Minerals, 2001.

Policy objectives and management

The policy framework

At present there is no policy or strategy document for mining activities, but the Directorate of Mines and Minerals has identified certain policy objectives:

- Encourage larger-scale hard-rock quarrying and a few properly managed large sand and gravel operations rather than small alluvial sand and gravel operations;
- Further investigate magnesite, graphite, talc, kaolin and bentonite resources; and
- Attract foreign and local investors for the exploitation and exploration of lead-zinc, ferrous-nickel (Fe-Ni) and bauxite deposits.

The legal framework

There are two major laws on mining: the 1980 Mining Law (No. 26/80) and the 1983 Geological Law. Both, however, are outdated and do not reflect the current institutional situation in Kosovo. A new law on mining is being prepared and the draft should be completed by the end of 2002.

The institutional framework

The Directorate of Mines and Minerals, in consultation with the Ministry of Environment and Spatial Planning, issues quarry and mining licences.

The Mining Advisory Board approves all exploitation licensing. The Ministry of Environment and Spatial Planning is represented on the Board. The licensing procedure requires the company interested in exploration to prepare technical guidelines and a note on an EIA to the Ministry and the municipalities. At present, approximately 100 companies have received licences. Unfortunately, there is still much illegal exploitation of sand and gravel, especially from riverbeds. A regulation establishing the Directorate of Mines and Minerals as an independent entity and giving it and the Mining Advisory Board real authority is in the final stages of approval. This should give the Directorate the powers necessary to close down illegal operations.

There is a small Mines Inspectorate in the Directorate of Mines and Minerals. Municipal inspectors, together with inspectors of the Ministry of Environment and Spatial Planning, inspect the licensed quarries.

It should be noted that there is very good cooperation between the Directorate and the Ministry, and this should help to further develop this sector along the principles of sustainable development (see also section on legal framework).

Conclusions

With a territory of only 10,887 km^2, Kosovo is very rich in mineral resources such as lead, zinc ores, bauxites, ferronickel ores, magnesite, lignite as well as chromite talc, kaolin and bentonite. Mineral resources have been intensively exploited in the past without any attention being paid to the environment. At present the mining and metallurgical industry is practically at a standstill, but all the old environmental problems remain. Huge areas affected by mining require rehabilitation. There is no monitoring system to measure the environmental impact of mining activities, nor equipment for rehabilitation. Further development of the mining sector is hampered by a lack of investment, the mining industry's lack of experience in environmental management and old and obsolete equipment.

To improve the situation the following measures are needed:

- Speed up the development and implementation of the law on mining, taking into account EU standards;
- Develop and implement a strategy for the further sustainable development of mining activities On the basis of this strategy, long-, medium- and short-term action plans should be developed and discussed with donors and investors;
- Start feasibility studies for the sustainable extraction of mineral resources from the closed mines;
- Encourage larger-scale hard-rock quarrying rather than small alluvial sand and gravel operations;
- Further investigate magnesite, graphite, talc, kaolin and bentonite resources;
- Attract investors for the exploration and exploitation of major lead-zinc, Fe-Ni and bauxite deposits; special attention should be given to clarifying liability for past and future environmental damage and financing for rehabilitation; and
- Rehabilitate tailings dumps and old mines, and introduce a monitoring system for surface and groundwater and air.

BIODIVERSITY CONSERVATION

Introduction

Kosovo covers almost 1.1 million ha and is composed of two large, distinct topographical units: Kosovo (656,000 ha) and Dukagjini (437,200 ha). Within these two areas, with their marginal belts and a number of smaller morphological units, there are certain distinguishable districts, including the Sharr/Sar Mountains, Kopaonik and Bjeshket e Nemuna/Prokletije Mountain districts, and the Drenica, Novobërdë/Novo Brdo and Upper Morava districts.

The Kosovo plateau's rivers belong to the Adriatic, Black Sea and Aegean basins, making it an important traffic route.

Kosovo has a modified, temperate continental climate, with Mediterranean influences in its low-lying parts. On the foothills of the northern, western, southern and eastern rims, the climate is transitional between temperate continental and sub-alpine.

Protected areas

Kosovo has a high diversity of ecosystems and habitats. Its total protected area is 46,000 ha, or 4.27% of its territory. Kosovo has 1 national park, 11 nature reserves, 37 natural monuments and 2 protected landscapes.

The area of the Sharr/Sar Mountains was declared a national park by decision of the Assembly of the Province of Kosovo on 28 March 1986. The national park is a mountainous area linked with the Bjeshket e Nemuna/Prokletije Mountains, Durmitor and the coastal Dinara mountains. These mountain ranges, with Sharr/Sar in the middle, represent the Balkan centre of endemic biodiversity. There are more than 2,000 species of vascular flora in the Sharr/Sar Mountain area. That is about 26% of Balkan and 18% of European flora. Analyses of the mountain range show that endemic (about 29%) and sub-endemic taxa (about 10%) are the most numerous, accounting for almost 40% of endemic flora of Sharr/Sar. Among its species, 86 have been declared internationally significant, 26 are included in the European Red List of Globally Threatened Animals and Plants, and 32 are included in the World Conservation Union (IUCN) Red List of Threatened Plants.

The current tasks are the re-establishment of an effective administration, immediate remediation measures, the drafting of a priority action programme and the preparation of a long-term strategy for sustainable integrated development.

The Bjeshket e Nemuna/Prokletije Mountains are another important site of European and Balkan biodiversity. The whole massif is known for its floristic richness with over 750 species of alpine vascular flora, of which 18 are local and 100 Balkan endemic species. In 1985, a proposal was made to make the Bjeshket e Nemuna/Prokletije Mountains a national park. The Mountains stretch across the northeast of Kosovo, and into Albania and Montenegro. The Montenegrin Government has also initiated action to designate them a national park.

Pressures on biodiversity

The pressure on nature and biodiversity comes mainly from forest exploitation, agriculture, industry and illegal construction.

Forest exploitation is putting increasing pressure on the long-term sustainability of Kosovo's forests and their ecosystems. Since the end of the conflict, the increased need for firewood due to the lack of alternative means of heating, and timber for reconstruction, has led to uncontrolled and illegal felling, with the current cut probably twice the sustainable yield. Uncontrolled and illegal logging has also increased the risk of erosion in the mountainous areas.

The environmental impact of the current level of agriculture is low. Fertilizer and agrochemical use is low and therefore not severely polluting the soil and the groundwater. But when the rural economy picks up, the use of fertilizers and pesticides is likely to increase.

Although industry is at a standstill, the sites of heavy industry are still a source of environmental pollution. The sites are contaminated with metal processing waste and various chemicals, which are leaking into surface and groundwater, and dust from tailings is escaping into the air. (See sections on waste, minerals, and industry, environment and health)

Uncontrolled land use and illegal construction also have a marked impact on biodiversity. Illegal houses have been built on forestland and protected areas, including in the Sharr/Sar Mountains National Park. In addition, illegal quarrying is still taking place on a large scale.

Policy objectives and management

The policy framework

There are no biodiversity policies and strategies specifically for Kosovo. The Environment Department is currently preparing a management and development plan, to include all the major stakeholders into the management of the National Park.

The legal framework

The protected areas were established by decision of the Assembly of Kosovo between 1970 and 1990. In its decision No. 11/1986, the Assembly declared the area of the Sharr/Sar Mountains a National Park. The Law on the Protection of Natural Values (No. 39/1988) is also important for nature and biodiversity protection.

The only approved environmental regulation is UNMIK regulation No. 2000/32, which is the basis for the establishment of the structure of the Environment Department. The Department has drafted several regulations, including one on the establishment of a provisional administration for the Sharr/Sar Mountain Park.

The institutional framework

INEP was established in 1974 by decision of the Assembly. It is now part of the structure of the Ministry of Environment and Spatial Planning. INEP is responsible for research, monitoring and assessment of biodiversity, and for establishing a database of natural resources and wildlife.

The Ministry has plans to integrate INEP and KHMI into an environmental protection agency. The Ministry's aim is to strengthen these two institutes and to provide them with the resources and services that are needed to monitor air, water and soil.

The Ministry of Agriculture, Forestry and Rural Development is responsible for forests and agricultural management, both of which are relevant to biodiversity management.

The Sharr/Sar Mountains National Park encompasses four municipalities; one with a population that is largely of Serbian ethnicity (Shtërpcë/Strpce) and three whose population is predominantly Albanian (Suharekë/Suva Reka, Prizren/Prizren, Kaçanik/Kacanik). The Albanian park authority of the Sharr/Sar Park is based in Prizren/Prizren, and the Serbian authority is based in Shtërpcë/Strpce. Cooperation between the two is very limited.

Forest guards from the forestry enterprises also manage the Park. Most of these forestry enterprises are private. The forest guards work closely with the park authorities. The park authority in Prizren/Prizren has advanced plans to hire forest protection guards as well to protect the Sharr/Sar Park and take over some of the responsibilities of the forest guards that work for the forest enterprises.

Conclusions

Kosovo has a very rich biodiversity with well-preserved ecosystems and rich natural resources. Several natural areas have been put under protection, mainly in the 1970s and 1980s; there are plans to protect further natural areas. The Environment Department and INEP, both responsible for biodiversity management, are making a great effort to protect these natural resources.

However, there are many threats to the natural heritage from forest exploitation, agriculture, industry and illegal construction. There are management plans for some of the protected areas. The Institute for Nature Protection of Serbia has extensive information about biodiversity in Kosovo. Information exchange and cooperation between the two nature institutes (Serbia and Kosovo) would be beneficial.

The nature conservation structure and management system in Kosovo should be strengthened through capacity building. In addition, management plans for protected areas and a strategy for nature and biodiversity protection should be prepared, with implementation ensured through legislation. Cooperation with its neighbours could help promote better protection of natural resources and more efficient park management.

INDUSTRY, ENVIRONMENT AND HEALTH

Introduction

Environmental problems associated with industrial activity have declined in the past 15 years as industrial output fell owing to lost export markets and the lack of competitiveness of many industries. Most heavy industries have either closed down or are working at sometimes as little as 5% of their capacity. There has been a clear shift from direct pollution, such as emissions to air and water from production processes, to pollution from waste sites, stored chemicals and dust (i.e. "past pollution"). Although the decline in industrial output has resulted in better environmental circumstances, social problems, such as unemployment, have grown.

In April 2002, there were 46,582 registered businesses, of which approximately 41,000 had four employees or less. In addition, it was estimated that there were 350 'socially owned' enterprises and approximately 60 public utility service providers (energy, water, waste, railways, airport, telecom and postal services). A socially owned enterprise is often a joint-stock company in which the employees own a large amount of the stocks.

Privatization

To solve the problems associated with the ownership of properties and the subsequent lack of investments, KTA has been given a mandate to privatize socially owned enterprises. Public enterprises will not be privatized. Privatization can take place either through spin-offs with a private investor or through voluntary liquidation resulting in a public auction of the assets of the enterprise. The proceeds of the privatization will be held in trusteeship by KTA until all issues of ownership have been solved. There are no specific environmental requirements in the privatization procedures, although EIAs can be part of the agreements.

Most heavy industries in Kosovo are concentrated in a number of industrial complexes. They are mainly based on mineral resources, are energy-intensive, have been badly maintained and have a poor environmental performance record. The main industrial hot spots are the two power plants in Obiliq/Obilic near Prishtinë/Pristina (see section on energy), the Trepca Mining and Metallurgical Complex near Mitrovicë/Mitrovica, the Mitrovica Industrial Complex and the ferronickel mines and metallurgical industries near Gllogovc/Glogovac. There are also some smaller industries, including a cement plant in Hani i Elezit/Djeneral Jankovic and a paint factory in Vushtrri/Vucitrn.

Trepca Mining and Metallurgical Complex

The Trepca Mining and Metallurgical Complex consists of nine lead, zinc and silver mines, three concentrators (crushing and flotation), a lead smelter, a zinc roaster and refinery, and two battery production plants. It is one of the biggest of its kind in Europe with proportionate environmental consequences. Especially the 'Zvecan' lead smelter,

situated just north of Mitrovicë/Mitrovica, has been associated with high levels of lead in the blood of employees and local residents, including in Mitrovicë/Mitrovica. During operation, the lead smelter would emit 15 to 30 kg of dust per ton of lead produced. The maximum capacity of its three furnaces was 840 tons of lead per day, but their mean daily production in 1986 was less than 300 ton/day (production in 1986 was 95,045 tons).

Studies conducted already in the 1980s found significantly higher levels of lead in the blood of children and pregnant women in Mitrovicë/Mitrovica than in a control group in Prishtinë/Pristina. Lead is known to have adverse health effects, especially on the psychomotor development and respiratory organs of children. In addition to exposure to airborne lead dust, high concentrations of zinc, cadmium and copper have also been measured.

Given the high environmental and human risks, UNMIK closed down the operations of the lead smelter in August 2000. However, blood lead levels taken during and after the operations indicated that the expected sharp decrease in blood lead levels did not materialize, suggesting a secondary source of lead pollution.

The situation has since stabilized, and environmental pollution from the complex now comes mainly from circulating lead dust and water pollution from the various waste sites and tailings. There are seven flotation tailing dumps containing 30 million tons of semi-liquid waste. In addition, it is estimated that 95,000 tons of industrial waste (of which half has a lead content of between 5 and 30%) is stored on site. The Zvecan lead slag heap amounts to 2.5 million tons, and there are about 1 million tons of waste at the Mitrovica Industrial Complex dumpsite. The environmental problems associated with the tailings are described in the section on waste. Air monitoring studies conducted by the Kosovo Force (KFOR) suggest that most of Mitrovicë/Mitrovica is exposed to an airborne lead concentration at or near the EU limit value of 0.5 $\mu g/m^3$. Samples taken at the smelter and the Mitrovicë/Mitrovica industrial park have shown concentrations as high as 57.5 $\mu g/m^3$. Lead deposition in the centre and south of Mitrovicë/Mitrovica exceeded 1000 $mg/m^2/day$, which is four times the WHO guideline.

The United Nations-led administration of Trepca is currently trying to secure funds for environmental remediation and for the development of business opportunities at the sites. Significant funds have been spent on environmental assessments to identify the environmental risks and protection measures for the Zvecan lead smelter, the mines and the subsidiary industries. These studies have been used to secure funding from Denmark, the Netherlands, Sweden and EAR for specific environmental remediation projects. These include the re-establishment of a waste-water treatment plant, hazardous waste management, investigation and remediation of two tailings dams and environmental monitoring at selected sites. The World Health Organization is also currently facilitating a health risk assessment and public health awareness campaign in Mitrovica/Mitrovicë, in which the Ministry of Environment and Spatial Planning and the Ministry of Health are integral implementing partners. It is expected that the results will be available in early 2003.

There has also been an environment and health assessment of the population near the Grancinca acid mine tailings dam, as well as investigations into the structural stability of the sites and plans for environmental remediation.

A recent survey identified very poor public knowledge of exposure and health effects. Further funding would be required to ensure a further reduction in environmental risk and a sustainable reduction in the affected population's exposure to lead.

Depending on important questions of ownership, debt relief and the feasibility of re-opening (parts of) the complex, investments are not expected to be sufficient. According one of the feasibility studies, a number of the mines and concentrators are viable as business units and could provide an interesting return on investment, while financial analysis indicates that the lead and zinc plants would have only a marginal return on investment. The Trepca Complex is aware that any new operations would have to have an accompanying EIA.

Mitrovica industrial complex

The Mitrovica industrial complex is part of the Trepca Mining and Metallurgical Complex and is situated at the southern end of Mitrovicë/Mitrovica. It consists of a zinc smelter, a sulphuric acid plant, a battery plant and a fertilizer plant. The sulphuric acid, as by-product of the zinc smelter, was used in the fertilizer and battery plants. No production is currently taking place. However, many chemicals remained stored on site, including 7,300 tons of

sulphuric acid, which is being sold and removed from the site. Owing to the absence of maintenance, most storage tanks are in bad condition and may cause soil and groundwater pollution. There are also stockpiles with concentrates of heavy metals (lead, zinc, copper and cadmium) on the site and the adjacent evaporation pond has been polluted with residual heavy metals.

Environmental management of industry

The Ministry of Environment and Spatial Planning has played a very strong advocacy role for improved environmental performance within the Trepca Complex, with strong donor coordination. However, it does not currently have many tools to regulate environmental pollution from industries. Pollution standards date back to the 1960s and 1970s but cannot be met owing to the lack of investments in clean technologies and poor environmental management practices. There is no environmental permit, and EIA requirements exist in draft form only. In addition, the environmental inspectors of the Ministry do not yet have a legal status to operate.

Policy objectives and management

The policy framework

Privatization is the primary industrial policy. There have been a number of studies on the clean-up of past pollution that continues to threaten public health and the environment, but, in the absence of sufficient funding, these have not been implemented and do not constitute an overall policy or strategy.

The legal framework

The legal framework depends on the adoption of the draft law on environmental protection. Until this has taken place, there are no legal requirements for industry either to apply for environmental permits or to carry out an impact assessment. The only exception to this is the quarry licence issued by the Ministry of Trade and Industry (see section on legal framework).

The institutional framework

The Ministry of Environment and Spatial Planning, and in particular its Environment Department, is responsible for the protection of Kosovo's environment. In the functions and responsibilities set out in UNMIK regulation 2002/5, there is a clear reference to monitoring and assessment of the environmental impact of industrial activities. In addition, KTA, under the reserved powers of the Special Representative of the Secretary-General, plays an important role in environmental protection from industrial activities. As KTA has "ownership" of most industries, these have to comply with the norms and standards that the Ministry of Environment and Spatial Planning will set.

Conclusions

There is currently no clear policy on the development of industries in Kosovo. The resumption of heavy industries depends entirely on the financial viability of the enterprises. As there are no (up-to-date) emission standards and norms and no legal standing for environmental inspectors, there is no incentive for industrial enterprises to comply with environmental standards. A temporary solution could be the inclusion of environmental measures in the sales agreements when privatizing. Not only an environmental audit but also a compliance plan, including investments in clean technologies, should form part of this agreement.

When developing the norms and standards, the Ministry of Environment and Spatial Planning will consider applying a step-by-step approach as established in the new environmental act. The target should be the standards of the European Union, but it is important that the Ministry develop a time frame for compliance that takes into account both the need for economic development and realistic implementation of the legislation.

In the present economic and social situation the development of small and medium enterprises could be a high priority.

ENERGY AND ENVIRONMENT

Introduction

The energy production sector is one of the worst environmental polluters in Kosovo. Electricity is generated at two lignite-fired thermal power plants, "Kosovo A" and "Kosovo B" in Obiliq/Obilic. There is one small 33 MW hydropower station and four district heating systems, with a combined capacity of 200 MW, which are fuelled with lignite and imported fuel oil. The district heating systems are for heat only.

The power stations have a capacity of 1460 MW and use low-quality lignite from the adjacent Mirage and Bardh mines. Electricity consumption before the conflict was 70% for households and 30% for industry. The two main industrial consumers, Ferroniki and Trepca industrial complexes, are currently idle. The five units of Kosovo A were built between 1962 and 1975 and are reaching the end of their useful service life. The two units of Kosovo B were built in 1983-1984 and are considered to be halfway through their useful service life. Both power stations have been equipped with electrostatic precipitators but not with flue-gas desulphurization or de-nitrification equipment. The electric precipitators in Kosovo B are working at an efficiency of 98%, while the filters in Kosovo A have a removal rate of between 50 and 80%. There has been almost no maintenance of the plants for many years.

Environmental pollution

The main air pollutants from the two thermal power plants are CO_2, SO_2, NO_x and dust (fly ash). The pollutants contribute to greenhouse effects, acid rain and respiratory diseases (dust). Little ambient air pollution monitoring takes place and there is no monitoring at the stacks. INKOS, the research and development institute of the Kosovo Electricity Company (KEK), employs 123 staff and is responsible for monitoring the plants' environmental pollution. However, INKOS does not have sufficient equipment to carry out its responsibilities adequately. There are many reports on the plants' pollution but few emission data. According to the reports, one of the 200 MW units emits up to 25 tons of dust per hour. The most recent emission data are from 1994 and provide some indication of the pollutions loads. (see table 4)

Waste water from the power plants is released via the canalization system in the Sitnica river. The neutralization basin of Kosovo A, however, does not work and waste water is released untreated. The plants' water consumption, including cooling water, stands at 2500 m^3/hour. Pollutants in the waste water include phenols, ammonia, chlorines, nitrates and heavy metals.

The 3 km^2 ash deposit of Kosovo A contains an estimated 26 million m^3 of ash. The depository is not covered with soil, so fly ash is blown away by the wind. The humidification system is outdated and is not working. The ash deposit of the Kosovo B plant is approximately 1 km^2 and in the same condition as that of Kosovo A. In total, it is estimated that between 30 and 50 million tons of ash have been generated by the two thermal power plants. INKOS is testing various grass species for covering the ash dumps.

According to a consultancy report, the filter ash of the lignite-fired power plants could be used as a cement substitute for concrete production as well as for the production of masonry bricks and for road construction. Another option that has been proposed is to transport the fly ash to parts of the mine that have been exhausted. No clear implementation plan seems to have been developed by either KEK or the Ministry of Environment and Spatial Planning.

Table 4: Emissions from thermal power plants

Power station	Kosovo A			Kosovo B	
Unit	A2	A3	A5	B1	B2
SO2 (mg/m3)	343	404	429	660	726
NOx (mg/m3)	472	713	871	573	939
Dust (mg/m3)	499	3,123	440	80	171

Source: ESTAP, 2001.

So far, EAR has allocated €130 million (US$ 116.4 million) to the overhaul of the two main power stations and the coal mines. Overhauling the power plants will make them more efficient and lead to a relative reduction in their air pollutants.

Policy objectives and management

The policy framework

There is no energy strategy that provides direction for the future development of Kosovo's energy sector. It is therefore difficult to assess to what extent environmental concerns are integrated into the activities undertaken to rehabilitate the two power stations. The "Program for reconstruction and recovery in Kosovo", prepared by the World Bank and the European Union in 1999, outlines a great number of short-term (until spring 2000) and medium-term (until spring 2003) objectives for the energy sector. The only short-term objective referring to environmental impacts suggests the need for a detailed environmental assessment that includes least-cost solutions and options for remedies, and the re-establishment of the monitoring network for controlling the emissions. In 2002, EAR agreed to support the purchase of monitoring equipment. Environmental concerns included in the medium-term objectives related only to the purchase of new precipitators.

The World Bank published a detailed report on the energy sector in Kosovo in September 2002; it assessed potential strategies for the coming 15 years.

The legal framework

The air pollution standards and norms that are currently applicable date back to the mid-1970s. Owing to the lack of sufficient monitoring equipment at the thermal power plants, the current emission loads are unknown, making enforcement difficult.

The institutional framework

The three most important institutions with responsibility for environmental protection are the Ministry of Environment and Spatial Planning (Environment Department), KTA and KEK. INKOS is responsible for monitoring pollution and researching potential solutions to environmental problems.

Energy efficiency

There has been no research into the demand for electricity. The consumption behaviour of households, building standards and the potential for savings and energy efficiency are unknown. This is true also for industries, which may have a high potential for savings owing to the current inefficiency of the outdated processes. Based on the general situation in countries in transition, good housekeeping measures alone could save 10% of the energy.

Little research has been done into the use of alternative sources of energy. This area should be further investigated.

There is an ongoing inter-ministerial initiative, begun in 2002, to encourage the public to reduce its consumption of electricity.

Conclusions

Kosovo is rich in reserves of lignite that are very economical to mine owing to the small overburden. It is therefore unlikely that other fuels would be substituted for lignite in the two power stations. To reduce pollution, efficiency improvements and cleaner technologies (end-of-pipe) will have to be applied, increasing the investment needs of the plants. However, too little is known about their exact emissions loads. The plants' environmental problems are apparent, but the precise amounts of dust, NO_x and SO_x and the quality of their waste water need to be identified. With donor assistance it is expected that the monitoring network will be improved so that it can qualify and quantify the environmental pollution.

Consultants have suggested solutions for the problems associated with the enormous fly-ash dumps. However, it is not known whether follow-up investigations into the reuse and infilling of the abandoned mines have been carried out. The Ministry of Environment and Spatial Planning, in cooperation with KEK, should follow up on these proposals. The Ministry should also expand its activities to the energy sector to ensure the sustainable use of natural resources and renewable energy. This could include the introduction of building standards and awareness raising for households in particular. These initiatives should be developed as part of a short- to medium-term development strategy to fully integrate environmental concerns in the energy sector.

AGRICULTURE AND FORESTRY

Introduction

Kosovo covers a total area of nearly 1.1 million ha, of which 53% (585,000 ha) is cultivable land while 41% (455,000 ha) is forestland. Nearly 51% of all cultivable land is used to grow crops, less than 1% is used for vineyards, 45% is pasture land and meadows, and the remaining 2% is planted with fruit trees. About 88% of the agricultural land is privately owned while the rest is socially owned.

Before 1999, agriculture was a major economic activity. In 1995, primary agricultural production represented 30% of Kosovo's GDP, 35% with the inclusion of forestry and food processing. In 1998, agriculture, forestry and agribusiness accounted for about 60% of employment and played a key role in the food security of households. As a direct consequence of the conflict, agricultural production came to a standstill in 1999.

The first growing season after the conflict was 2000, but not all farmers had enough tools, equipment, seeds and other inputs to get good yields. At the end of 1999, a conservative estimate by the European Union and the World Bank put the total cost of replacing the lost animals, destroyed farm buildings and agricultural machinery at some US$ 700 million to 800 million. Most livestock was reportedly lost or killed. Over half the agricultural machines disappeared or were in need of repair. Therefore, in 1999 and 2000, Kosovo relied on commercial imports and large-scale donor relief. The 2002 growing season looks more favourable, and the rural economy seems to be reviving.

Forty per cent of the forests are privately owned, while the remaining 60% is under State ownership. The forestry sector has received very little attention in recent years.

The wood-processing industry is facing considerable difficulties. The main reasons are the uncertain supply of energy, the unstable supply of logs at competitive prices, the lack of spare parts and the lack of funding. Because of this, production has been badly hampered and the financial situation of the companies is generally poor.

Environmental concerns in agriculture

The environmental impact of the current level of agricultural activity is low, but the situation could rapidly change when agriculture takes off. The main environmental impacts from agriculture in Kosovo are on soil, water, biodiversity and landscapes.

In particular in the upland areas, land erosion is a major concern. Erosion rates are high in the mountains, with the soil material transported down into the lowlands as fluvial sediments and debris flows. Agriculture has not caused serious soil or environmental pollution since the consumption of fertilizers and pesticides is fairly low. However, the absence of a soil inventory and of regular soil monitoring is an obstacle to soil protection and sustainable management, since the true condition of the soil is practically unknown.

Irrigation and drainage are vital for Kosovo, and there is currently a need to increase productivity by restoring irrigation schemes. Most river flows, apart from snowmelt-fed rivers, however, are very low during the irrigation season, and larger flows from water transfers or reservoir discharges are needed to support the restoration programme. Currently only 26% of the land is irrigated. Six irrigation schemes are being rehabilitated with EAR assistance.

Demands from the rivers will increase as the irrigation systems become fully operational. However, there is no monitoring of the volumes abstracted, stored or transferred or on the downstream impacts on river flows and quantity. The main types of environmental impact arising from irrigation appear to be damage to habitats and aquifer exhaustion by abstraction of irrigation water; intensive forms of irrigated agriculture displacing formerly high-value semi-natural ecosystems; and increased erosion of cultivated soils on slopes. There is a need to set limits on the volumes of water abstracted and to monitor the impacts on the river systems and ecosystems.

The impact of fertilizers and pesticides is relatively low, owing to their low use. But the use of agrochemicals is likely to increase soon, so policies

should be developed now to minimize the risk of run-off. The main environmental impact of the use of fertilizers and pesticides is the pollution of water and soil.

Environmental concerns in forestry

The high demand for wood in the aftermath of the conflict is putting increasing pressure on the long-term sustainability of Kosovo's forests and ecosystems. The wood is mainly used for heating, construction and trade. Uncontrolled and illegal felling has also increased the risk of erosion in the mountainous areas. Forests have been destroyed by fire too; according to the Forestry Department of the Ministry of Agriculture, Forestry and Rural Development, 3,263 ha were lost in this way in 2000. The Food and Agricultural Organization of the United Nations (FAO) implemented a reforestation project in 2000 on approximately 200 ha.

Policy objectives and management

The policy framework

Kosovo's 2002 budget sets the following objectives for the agricultural sector:

- Increase agricultural production;
- Provide employment in rural areas by developing farm and non-farm activities;
- Promote private enterprises to expand the agricultural sector;
- Develop a legal and regulatory framework to monitor agricultural, rural and forestry activities; and
- Support the revival of the agricultural cooperative sector through training and capacity building, and the creation of a regulatory framework.

In December 2001, the former Administrative Department of Agriculture, Forestry and Rural Development identified its "Priorities for the Development of the Agricultural Sector". The current Ministry of Agriculture, Forestry and Rural Development has recently drafted a "Green Book for Agriculture", as the basis for a strategy that will give the basic orientation for agriculture. It is not known to what extent it included environmental concerns. There is no strategy for the management of forests and forestland, or the conservation of their flora and fauna.

The legal framework

The 1987 Forest Law (No. 10/1987) is the main law on forest management, although it is outdated and no applicable to the present institutional arrangements. A new forest act has recently been drafted; it will constitute the basis for improved forest management and more efficient use of forestland. To meet the ambitious goals set out in the act, operational resources must be better organized and strengthened.

The institutional framework

The Ministry of Agriculture, Forestry and Rural Development is responsible for the development of policies and implementing legislation for agriculture, forestry and rural development. Its mandate also includes the development of irrigation policies, including the planning of irrigation schemes. The Ministry is divided into an Agriculture and Rural Development Department, a Forestry Department, an Animal Production Department, and a Plant Production and Protection Department. According to regulation 2002/5, responsibility for water resources management, excluding irrigation, has been assigned to the Ministry of Environment and Spatial Planning.

The Forestry Department is responsible for developing a regulatory framework for public and private forestry management by establishing an overall policy for the conservation of forests and forestland resources, developing a strategy and a regulatory framework for the effective administration of forest and forestland, and the conservation of flora and fauna.

The Kosovo Forest Agency, which was established in 2000, is responsible for matters relating to the administration of forests and forestlands, including forest management, the use of forest resources, and the conservation of flora and fauna. It operates under the authority of the Ministry of Agriculture, Forestry and Rural Development.

International cooperation

The European Union and the World Bank prepared a document, "Towards Stability and Prosperity – A Program for Reconstruction and Recovery in Kosovo," for the Second Donors' Conference, held in November 1999 in Brussels. It covered external financing requirements for the year 2000, giving

particular attention to restoring agricultural productivity, which had been damaged by the conflict and previous neglect. In addition, a medium-term programme of policy actions and public investment recommendations to revitalize the rural economy was included ("Kosovo: Re-launching the Rural Economy – A Medium Term Reconstruction and Recovery Program"). It is not clear to what extent this programme has been implemented.

FAO has been coordinating the international community's efforts to address the needs in the agricultural and forestry sector. The main ongoing forestry projects are the Forestry Emergency and Rehabilitation Project, the Forest Institutions Capacity Building Project and the Forestry Inventory Project.

Several other international institutions have been assisting in the formulation of short- and medium-term reconstruction and recovery programmes for the agricultural sector.

Eco-agriculture is very limited. The Regional Environmental Center's field office has recently started a project on eco-agriculture and sustainable rural development. The main activity is to introduce and promote the concept of eco-agriculture and its possibilities for Kosovo via training, active information campaigns, field trials and the production and distribution of local hand guides on the subject.

Conclusions

The rehabilitation of agriculture after the end of the conflict has made significant progress; agriculture is now a priority in the budget. This provides an opportunity to oversee the development of agriculture from an environmental perspective too. It is crucial to monitor the environmental impact of large-scale investments aiming at an industrialized agricultural sector, using fertilizer, pesticides, genetically modified organisms and irrigation systems, and to control and prevent their potential adverse impact on the environment.

Moreover, the capacity of farmers to work knowledgeably with modern agricultural inputs has to be developed. Education about and experience with the use of modern pesticides and fertilizers are virtually non-existent. One way to prevent environmental problems is to promote sustainable rural development, for example through training and courses in the rational use of pesticides and fertilizer, as well as by offering alternatives, such as ecological pest prevention and ecological agriculture. In addition, economic incentives and other means can be applied to encourage family farms to turn to various forms of sustainable agriculture.

Another serious problem in the agricultural sector is the use of water for irrigation. A combined approach involving advice and support to encourage a reduction and a more efficient use of water is needed, including appropriate abstraction limits for users. There is also a need to monitor the impacts of irrigation on rivers and on ecosystems.

The forest resources of Kosovo have been under constant pressure for several decades. The reasons for this are numerous, such as inconsistencies in the Forest Law, a high demand for wood, and very weak control and coordination in the management and use of forest resources. To improve the situation, better control and good management of forest resources is needed. The promulgation of the new forest act could be helpful in this regard. At the moment there is limited knowledge of efficient and sustainable forest management. This could be overcome through training of forestry staff and public information campaigns.

To protect the forests and decrease illegal logging, the number of forest guards should be increased. Strict enforcement is essential. The capacity of the Forestry Department and the Kosovo Forestry Agency should be strengthened. In addition, cooperation with the Environment Department on activities related to agriculture, forestry and water resources should be increased.

Inherited agricultural and related legislation requires revision and realignment with modern European and international law and practice. The development of new legislation and regulations in the areas of agricultural land, forestry, veterinary, plant, food, seed, and cooperatives, is a major time-consuming task requiring expertise that is not always readily available. To address it systematically, support is required for a review of each major category of legislation to determine the requirements for revision within each and to establish priorities.

Finally, a strategy for the management of forests and forestland, including environmental concerns,

and the conservation of flora and fauna should be prepared by the Forestry Department (Ministry of Agriculture, Forestry and Rural Development) in close coordination with the Environment Department (Ministry of Environment and Spatial Planning).

EDUCATION AND PUBLIC AWARENESS

Background

It is widely acknowledged that environmental consciousness has not yet become an important aspect of life in Kosovo. The environment has suffered decades of abuse as a result of mismanagement, neglect, political and social conflict. While there have been many concrete improvements in recent years, particularly in the public utility sector, waste continues to be dumped almost anywhere, indiscriminately. The amount of destruction debris far exceeds the capacity to process it. Rivers and streams are often used as dumping areas. Fires, set for no particular purpose, cause air pollution. Deforestation threatens to cause long-term environmental degradation.

The policy framework

The Environment Department has developed and is implementing several programmes to foster environmental consciousness and awareness, in cooperation with local and international NGOs and competent authorities. Among those programmes are a Kosovo-wide media campaign financed by the United Nations Children's Fund (UNICEF), a water-saving campaign, an energy-saving campaign, the distribution of printed material, the organization of special events (festivals, concerts) and seminars, and workshops with the involvement of students, teachers, and NGO representatives. Among the important products of some of these projects are the first environmental education book to be distributed free in all schools and community centres, the first ecology dictionary and a biweekly newsletter "The Environmental Monitor," which is distributed in all municipalities and among stakeholders.

Conclusions

There is an urgent need to foster environmental education and awareness in all sectors of Kosovo society and to strengthen the capacity of NGOs. For this reason the Environment Department is developing a plan of micro-credit to support NGO regional and municipal environmental projects. At the same time there is a need for local NGOs not only to strengthen their capacity to implement projects, but also, and especially, to perform an advocacy role for the environment.

ANNEXES

ANNEX I
SELECTED ECONOMIC AND ENVIRONMENTAL DATA

The Federal Republic of Yugoslavia: Selected economic data

	1995	2000
TOTAL AREA (1 000 km^2)	102.2	102.2
POPULATION		
Total population, (1 000 000 inh.)	10.5	10.6
% change (1995-2000)	..	0.8
Population density, (inh./km^2)	103.0	..
GROSS DOMESTIC PRODUCT		
GDP, (billion US$)	15.3	15.0
% change (1995-2000)	..	-2.0
per capita, (US$ 1000/cap.)	1.4	1.4
INDUSTRY		
Value added in industry (% of GDP)	48.0	..
Industrial production - % change (1995-2000)	..	..
AGRICULTURE		
Value added in agriculture (% of GDP)	22.0	..
ENERGY SUPPLY		
Total supply, (Mtoe)	11.9	11.7
% change (1995-2000)	..	..
Energy intensity, (Toe/US$ 1000)	0.8	0.8
% change (1995-2000)	..	..
Structure of energy supply, (%)	..	..
Solid fuels	66.4	65.8
Oil	15.0	12.8
Gas	11.5	12.8
Nuclear	..	..
Hydro,etc.	7.1	8.6
ROAD TRANSPORT		
Road traffic volumes	..	..
-billion veh.-km	34.0	..
- % change (1995-2000)	..	..
- per capita (1 000 veh.-km/cap.)	3.2	..
Road vehicle stock,	..	..
- 10 000 vehicles	..	..
- % change (1995-2000)	..	..
- per capita (veh./100 inh.)	..	..

Source: UNECE and National Statistics
.. = not available. - = nil or negligible.

The Federal Republic of Yugoslavia: Selected environmental data

	1995	2000
LAND		
Total area (1 000 km^2)	102.2	102.0
Major protected areas (% of total area)	4.0	4.0
Nitrogenous fertilizer use (t/km^2 arable land)	3.3	4.2
FOREST		
Forest area (% of land area)	28.0	28.0
Use of forest resources (harvest/growth)	0.5	0.5
Tropical wood imports (US$/cap.)	..	..
THREATENED SPECIES		
Mammals (% of species known)	35.0	..
Birds (% of species known)	66.0	..
Fish (% of species known)	33.0	..
WATER		
Water withdrawal (million m3/year)	..	..
Fish catches (% of world catches)	..	..
Public waste water treatment (% of population served)	..	..
AIR		
Emissions of sulphur oxides (kg/cap.)	44.0	..
" (kg/US$ 1000 GDP)	28.0	..
Emissions of nitrogen oxides (kg/cap.)	5.6	..
" (kg/US$ 1000 GDP)	3.6	..
Emissions of carbon dioxide (t/cap.)	2.9	..
" (ton/US$ 1000 GDP)	1.8	..
WASTE GENERATED		
Industrial waste (kg/US$ 1000 GDP)	..	..
Municipal waste (kg/cap.)	..	..
Nuclear waste (ton/Mtoe of TPES)	..	..
NOISE		
Population exposed to leq > 65 dB (A) (million inh.)	..	..

Source: UNECE and National Statistics

.. = not available. - = nil or negligible.

ANNEX II

SELECTED MULTILATERAL AND BILATERAL AGREEMENTS

Worldwide agreements		Federal Republic of Yugoslavia	
Year		Year	Status
1949	(GENEVA) Convention on Road Traffic		
1951	International Plant Convention	**1955**	**R**
1954	International Convention for the Prevention of Pollution of the Sea by Oil	**1973**	**R**
1957	(BRUSSELS) International Convention on Limitation of Liability of Owners of Sea-going Ships		
1958	(GENEVA) Convention on Fishing and Conservation of Living Resources of the High Seas	**1966**	**R**
1958	Convention on the Continental Shelf	**1966**	**R**
1958	Convention on the Territorial Sea and the Contiguous Zone	**1958**	**R**
1958	Convention on the High Seas	**1965**	**R**
1960	International Convention for the Safety of Life at Sea	**1964**	**R**
1960	(GENEVA) Convention concerning the Protection of Workers against Ionising Radiations		
1963	(VIENNA) Convention on Civil Liability for Nuclear Damage 1997 (VIENNA) Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage	**1977**	**R**
1963	(MOSCOW) Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and under Water	**1964**	**R**
1969	(BRUSSELS) Convention on Civil Liability for Oil Pollution Damage 1976 (LONDON) Protocol	**1976**	**R**
1969	(BRUSSELS) Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties	**1976**	**R**
1971	Convention on Wetlands of International Importance Especially as Waterfowl Habitat 1977	**1977**	**R**
1971	(RAMSAR) Convention on Wetlands of International Importance especially as Waterfowl Habitat 1982 (PARIS) Amendment 1987 (REGINA) Amendments	**1977**	**R**
1971	(GENEVA) Convention on Protection against Hazards from Benzene (ILO 136)	**1975**	**R**
1971	(BRUSSELS) Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage	**1978**	**R**
1971	(LONDON, MOSCOW, WASHINGTON) Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Sea-bed and the Ocean Floor and in the Subsoil thereof	**1973**	**R**
1972	(PARIS) Convention on the Protection of the World Cultural and Natural Heritage	**1975** **2001 Succession**	**R**
1972	(LONDON) Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1978 Amendments (incineration) 1980 Amendments (list of substances)	**1976**	**R**
1972	Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons, and their Destruction	**1973**	**R**
1972	International Convention on the International Regulations for Preventing Collision at Sea	**1975**	
1972	(GENEVA) International Convention for Safe Containers		
1973	(WASHINGTON) Convention on International Trade in Endangered Species of Wild Fauna and Flora 1983 (GABORONE) Amendment	**2002**	**R**
1973	(LONDON) Convention for the Prevention of Pollution from Ships (MARPOL)	**1980**	**R**
	1978 (LONDON) Protocol (segregated ballast)	**1983**	**R**
	1978 (LONDON) Annex III on Hazardous Substances carried in packaged form		
	1978 (LONDON) Annex IV on Sewage		
	1978 (LONDON) Annex V on Garbage		

Worldwide agreements		Federal Republic of Yugoslavia	
Year		Year	Status
1975	Convention Concerning the Protection of the World Cultural and Natural Heritage	1975 2001 Succession	R
1977	(GENEVA) Convention on Protection of Workers against Occupational Hazards from Air Pollution, Noise and Vibration (ILO 148)	1983	R
1979	(BONN) Convention on the Conservation of Migratory Species of Wild Animals		
	1991 (LONDON) Agreement Conservation of Bats in Europe		
	1992 (NEW YORK) Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS)		
	1995 (THE HAGUE) African/Eurasian Migratory Waterbird Agreement (AEWA)		
	1996 (MONACO) Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS)		
1980	Convention on the Physical Protection of Nuclear Material	1986	R
1981	Convention Concerning Occupational Safety and Health and the Working Environment	1987	R
1982	(MONTEGO BAY) Convention on the Law of the Sea	1986 2001 Succession	R
	1994 (NEW YORK) Agreement Related to the Implementation of Part XI of the Convention		
	1994 (NEW YORK) Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory		
1985	Convention Concerning Occupational Health Services	1990	R
	(VIENNA) Convention for the Protection of the Ozone Layer	1990 1992 Succession	R
	1987 (MONTREAL) Protocol on Substances that Deplete the Ozone Layer	1991 1992 Succession	R
	1990 (LONDON) Amendment to Protocol		
	1992 (COPENHAGEN) Amendment to Protocol		
	1997 (MONTREAL) Amendment to Protocol		
1986	Convention Concerning Safety in the Use of Asbestos	1989	R
	(VIENNA) Convention on Early Notification of a Nuclear Accident	1989	R
	(VIENNA) Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency	1991	R
1989	(BASEL) Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	2000	R
	1995 Ban Amendment		
	1999 (BASEL) Protocol on Liability and Compensation		
1990	(LONDON) Convention on Oil Pollution Preparedness, Response and Cooperation		
1992	(RIO) Convention on Biological Diversity	2002	R
	2000 (CARTAGENA) Protocol on Biosafety		
1992	(NEW YORK) Framework Convention on Climate Change	1996 2001 Succession	R
	1997 (KYOTO) Protocol		
1993	Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction	2000	R
1994	(VIENNA) Convention on Nuclear Safety		
1994	(PARIS) Convention to Combat Desertification		
1997	(VIENNA) Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management		
1997	(VIENNA) Convention on Supplementary Compensation for Nuclear Damage		
1998	(ROTTERDAM) Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade		

S = signed; **R** = ratified; **D** = denounced.

Selected bilateral and multilateral agreements *(continued)*

Regional and sub regional agreements		Federal Republic of Yugoslavia	
Year		**Year**	**Status**
1950	(PARIS) International Convention for the Protection of Birds	**1973**	**R**
1951	Convention for the Establishment of the European and Mediterranean Plant	**1953**	**R**
1957	(GENEVA) European Agreement - International Carriage of Dangerous Goods by Road (ADR) European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR) Annex A Provisions Concerning Dangerous Substances and Articles Annex B Provisions Concerning Transport Equipment and Transport	**1971**	**R**
1958	(GENEVA) Agreement - Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts.		
1958	Convention Concerning Fishing in the Water of the Danube	**1958**	**R**
1968	(PARIS) European Convention - Protection of Animals during International 1979 (STRASBOURG) Additional Protocol		
1969	(LONDON) European Convention - Protection of the Archeological Heritage	**1990**	**R**
1969	(LONDON) European Convention - Protection of the Architectural Heritage	**1991**	**R**
1973	(GDANSK) Convention on fishing and conservation of the living resources in the Baltic Sea and the Belts 1982 (WARSAW) Amendments		
1974	Yugoslav-Italian Agreement on the Protection of the Waters of the Adriatic Sea and Coastal Areas Against Pollution	**1977**	**R**
1974	(HELSINKI) Convention on the Protection of the Marine Environment of the Baltic Sea Area		
1976	European Convention for the Protection of Animals Kept for Farming Purposes	**2001**	**R**
1976	Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircrafts	**1976**	**R**
1976	Protocol Concerning Co-operation in Combating Pollution of Mediterranean Sea by oil and Other Harmful Substances in Cases of Emergency	**1976**	**R**
1976	Convention for the Protection of the Mediterranean Sea against Pollution	**1978**	**R**
1979	(BERN) Convention on the Conservation of European Wildlife and Natural Habitats		
1979	(GENEVA) Convention on Long-range Transboundary Air Pollution	**1987** **2001 Succession**	**R**
	1984 (GENEVA) Protocol - Financing of Co-operative Programme (EMEP)	**1987**	**R**
	1985 (HELSINKI) Protocol - Reduction of Sulphur Emissions by 30%		
	1988 (SOFIA) Protocol - Control of Emissions of Nitrogen Oxides		
	1991 (GENEVA) Protocol - Volatile Organic Compounds		
	1994 (OSLO) Protocol - Further Reduction of Sulphur Emissions		
	1998 (AARHUS) Protocol on Heavy Metals		
	1998 (AARHUS) Protocol on Persistent Organic Pollutants		
	1999 (GOTHENBURG) Protocol to Abate Acidification, Eutrophication and Ground-level Ozone		

S = signed; **R** = ratified; **D** = denounced.

Selected bilateral and multilateral agreements *(continued)*

Regional and subregional agreements		Federal Republic of Yugoslavia	
Year		**Year**	**Status**
1980	Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources	**1990**	**R**
1982	Protocol Concerning Mediterranean Specially Protected Areas	**1985**	**R**
1986	Agreement for the Environmental Protection from Pollution of the Tisza River and Tributaries	**1990**	**R**
1991	(ESPOO) Convention on Environmental Impact Assessment in a Transboundary		
1992	(HELSINKI) Convention on the Protection and Use of Transboundary Waters and International Lakes 1999 (LONDON) Protocol on Water and Health		
1992	(HELSINKI) Convention on the Transboundary Effects of Industrial Accidents		
1992	(HELSINKI) Convention on the Protection of the Marine Environment of the Baltic Sea Area, 1992		
1992	(PARIS) Convention for the Protection of the Marine Environment of the North-East Atlantic		
1993	(OSLO and LUGANO) Convention - Civil Liability for Damage from Activities Dangerous for the Environment		
1994	(LISBON) Energy Charter Treaty 1994 (LISBON) Protocol on Energy Efficiency and Related Aspects		
1996	Treaty between the Federal Government of FRY and Government of the Russian Federation on Cooperation on Environmental Protection		**R**
1996	Treaty between the Federal Government of FRY and Government of the Russian Federation on Cooperation on Preventing Industrial Hazards, Natural Disasters and Remediation of their Consequences		**R**
1998	(AARHUS) Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters		
1999	Agreement for the Establishment of a General Fisheries Council for the Mediterranean	**Accepted by Kingdom of Yugoslavia 1951**	

S = signed; **R** = ratified; **D** = denounced.

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